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 (Common Element)
- ☐ 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)

To obtain Draft Plan of Subdivision approval to create a development block including Draft Plan of Condominium (Common Element) approval creating parcels of tied land to accommodate the proposed Single Detached and Townhome Dwellings. Lastly, to obtain Site Plan Approval for the proposed phase of development. A Removal of Holding Symbol application (e.g. Zoning By-law Amendment) will be filed upon confirmation of the Removal of Holding Symbol conditions being fulfilled. See Cover Letter with Planning Justification Analysis for additional details.

Property Assessment Roll Number: 3310337040192960000

A. Applicant Information

Name of Owner Ballantry (Dover Coast) Inc.

Address 20 Cachet Woods Court, Suite No. 6

Town and Postal Code Markham, ON - L6C 3G1

Phone Number (905) 887-7235

Cell Number N/A

Email dhill@ballantryhomes.com

Name of Applicant Maurizio Rogato - Blackthorn Development Corp.

Address PO Box 943

Town and Postal Code Kleinburg, ON L0J 1C0

Phone Number (416) 888-7159

Cell Number (416) 888-7159

Email mrogato@blackthorncorp.ca

Name of Agent SAME AS APPLICANT

Address

Town and Postal Code

Phone Number

Cell Number

Email

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

☐ Owner ☐ Agent ☑ Applicant

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

Existing stormwater management easement per Instrument No. NK48280.

See Parcel Abstract for Mortgagee Details.

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 Lot 15, Wdh Concession 1 & Part 36 Plan No. 37R-9924

   Municipal Civic Address: N/A - Vacant Land

   Present Official Plan Designation(s): Urban Residential, Lake Shore Special Policy Area

   Present Zoning: Residential R4-Zone' with a Holding Symbol (H)

2. Is there a special provision or site specific zone on the subject lands?
   ☑ Yes ☐ No If yes, please specify corresponding number:
   14.543

3. Present use of the subject lands:
   Vacant

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:
   N/A - Lands are void of any Existing Structures.

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 - Lands are void of any Existing Structures.

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:
   See Provided Concept Plan and Draft Plan of Subdivision provided with this Application.
   Proposal consists of 73 Single Detached Dwellings and 48 Townhome Dwellings including Private Road Network, a Privately Owned Publicly Accessible Space (POPS) and pedestrian walkways.

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:

   N/A

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

   Unknown

9. Existing use of abutting properties:

   Residential, Recreational (Golf Course)

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:

    Existing Stormwater Management Easement to be maintained and reconfigured through the Detailed Design process.

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:

   The Subject Lands are intended to be developed for residential uses consisting of single detached dwellings and townhouse dwellings, totalling 121 dwellings. Two site accesses are proposed off of Dover Coast Boulevard with 14-metre Private Streets, proposed, internally, two pedestrian walkway paths and a Privately-Owned Publicly Accessible Space (e.g. POPS) proposed centrally.

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

   The Proposed development conforms to the Official Plan and Complies with the Zoning By-law.

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:

   N/A

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

   N/A

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):
N/A

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

Description of land intended to be retained in metric units:
Frontage:
Depth:
Width:
Lot Area:
Present Use:
Proposed Use:
Buildings on retained land:

7. Description of proposed right-of-way/easement:
Frontage:
Depth:
Width:
Area:
Proposed use:

8. Name of person(s), if known, to whom lands or interest in lands to be transferred, leased or charged (if known):
N/A

9. **Site Information**	**Zoning**	**Proposed**
Please indicate unit of measurement, for example: m, m^2 or %		
Lot frontage	Proposed Development complies with applicable zoning including special provision.	
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	2 parking spaces per dwelling	Parking on each driveway and garages
Number of visitor parking spaces	1 visitor space for every 3 dwelling units	52 On-Street Parking Spaces (See Parking Plan)
Number of accessible parking spaces	Nil.	Nil.
Number of off street loading facilities	Nil.	Nil.

12. Residential (if applicable)

Number of buildings existing: 0

Number of buildings proposed: 121 Dwellings/Buildings

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

If yes, describe: N/A

Type	Number of Units	Floor Area per Unit in m2
Single Detached	73	N/A
Semi-Detached	0	
Duplex	0	
Triplex	0	
Four-plex	0	
Street Townhouse	48	N/A
Stacked Townhouse	0	
Apartment - Bachelor	0	
Apartment - One bedroom	0	
Apartment - Two bedroom	0	
Apartment - Three bedroom	0	

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

13. Commercial/Industrial Uses (if applicable)

Number of buildings existing: 0

Number of buildings proposed: 0

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

If yes, describe:

N/A

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

N/A

Seating Capacity (for assembly halls or similar): _____

Total number of fixed seats: _____

Describe the type of business(es) proposed: N/A

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:

N/A

14. Institutional (if applicable)

Describe the type of use proposed: _____

Seating capacity (if applicable): _____

Number of beds (if applicable): N/A

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)

POPS - 1.44 Hectares

Path - 0.03 Hectares

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):

   Golf Pro-shop including Clothing Store existing on Adjacent Lands.

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:

   The Suject Lands represent a 4th Phase of the Dover Coast Community.

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
   Not appropriate

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:

   There is no amending application. However, the proposed development is consistent with the Provincial Planning Statement.

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:

   An Environmental Impact Study (EIS) has not been determined to be required through the Pre-Application Consultation process. Further, the Subject Lands represent a 4th Phase of the Dover Coast Community and are devoid of any natural features or species.

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:

   N/A

   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 N/A

   Wooded area

   ☐ On the subject lands or ☐ within 500 meters – distance N/A

   Municipal Landfill

   ☐ On the subject lands or ☐ within 500 meters – distance N/A

   Sewage treatment plant or waste stabilization plant

   ☐ On the subject lands or ☐ within 500 meters – distance N/A

   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 N/A

   Rehabilitated mine site

   ☐ On the subject lands or ☐ within 500 meters – distance N/A

   Non-operating mine site within one kilometre

   ☐ On the subject lands or ☐ within 500 meters – distance N/A

   Active mine site within one kilometre

   ☐ On the subject lands or ☐ within 500 meters – distance N/A

   Industrial or commercial use (specify the use(s)) Golf Pro Shop including

   ☐ On the subject lands or ☑ within 500 meters – distance Clothing Store on Adjacent Lands

   Active railway line

   ☐ On the subject lands or ☐ within 500 meters – distance N/A

   Seasonal wetness of lands

   ☐ On the subject lands or ☐ within 500 meters – distance N/A

   Erosion

   ☐ On the subject lands or ☐ within 500 meters – distance N/A

   Abandoned gas wells

   ☐ On the subject lands or ☐ within 500 meters – distance N/A

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)

Use of existing stormwater management pond constructed in prior phases.

2. Existing or proposed access to subject lands:

☐ Municipal road ☐ Provincial highway

☐ Unopened road ☑ Other (describe below)

Name of road/street: Private Roads (Common Element)

G. Other Information

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

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

N/A

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.

See Cover Letter provided.

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	October 6, 2025 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 David Hill - Ballantry (Dover Coast) Inc. am/are the registered owner(s) of the lands that is the subject of this application.

I/We authorize Maurizio Rogato - Blackthorn Development Corp. 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.

David Hill Owner	October 3, 2025 Date
Owner	Date

N. Declaration

I, Maurizio Rogato - Blackthorn Development Corp. of the City of Vaughan in the Region of York

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 Vaughan

In the Region of York

This 6th day of October

A.D., 2025

A Commissioner, etc.

A Commissioner, etc., Province of Ontario
Kody Anthony Giallonardo
Expires March 12, 2027
for Blackthorn Development Corp.

Owner/Applicant Signature

DOVER COAST DEVELOPMENTS P4

PORT DOVER ONTARIO
NORFOLK COUNTY

LIST OF DRAWINGS	
1	MASTER PLAN OF SERVICES
2	STORM AREA PLAN
3	SANITARY AREA PLAN
4	STORM AND SANITARY DESIGN SHEETS
5	STREET A - FROM DOVER COAST BLVD TO 0+270.00
6	STREET A - FROM 0+220 TO STREET C
7	STREET B - FROM STREET A TO STREET D
8	STREET C - FROM STREET A TO STREET D
9	STREET D - FROM DOVER COAST BLVD TO 0+210.00
10	STREET D - FROM 0+115.00 TO STREET C
11	PARK SERVICING
12	RYCB 1 - LOT 1/2, RYCB 2 - LOT 4/5, RYCB 3 - LOT 7/8, RYCB 4 - LOT 10/11, RYCB 5 - LOT 13/14
13	RYCB 6 - LOT 16/17, RYCB 7 - LOT 19/20, RYCB 8 - LOT 21/22, RYCB 9 - LOT 23/24, RYCB 10 - LOT 24/BLOCK 13
14	RYCB 11 - BLOCK 13/14, RYCB 12 - BLOCK14/LOT 25, RYCB 13 - BLOCK 7, RYCB 14 - BLOCK 7/8, RYCB 15 - BLOCK 8/9
15	GRADING PLAN
16	CONSTRUCTION NOTES
17	CONSTRUCTION DETAILS
18	PARKING PLAN

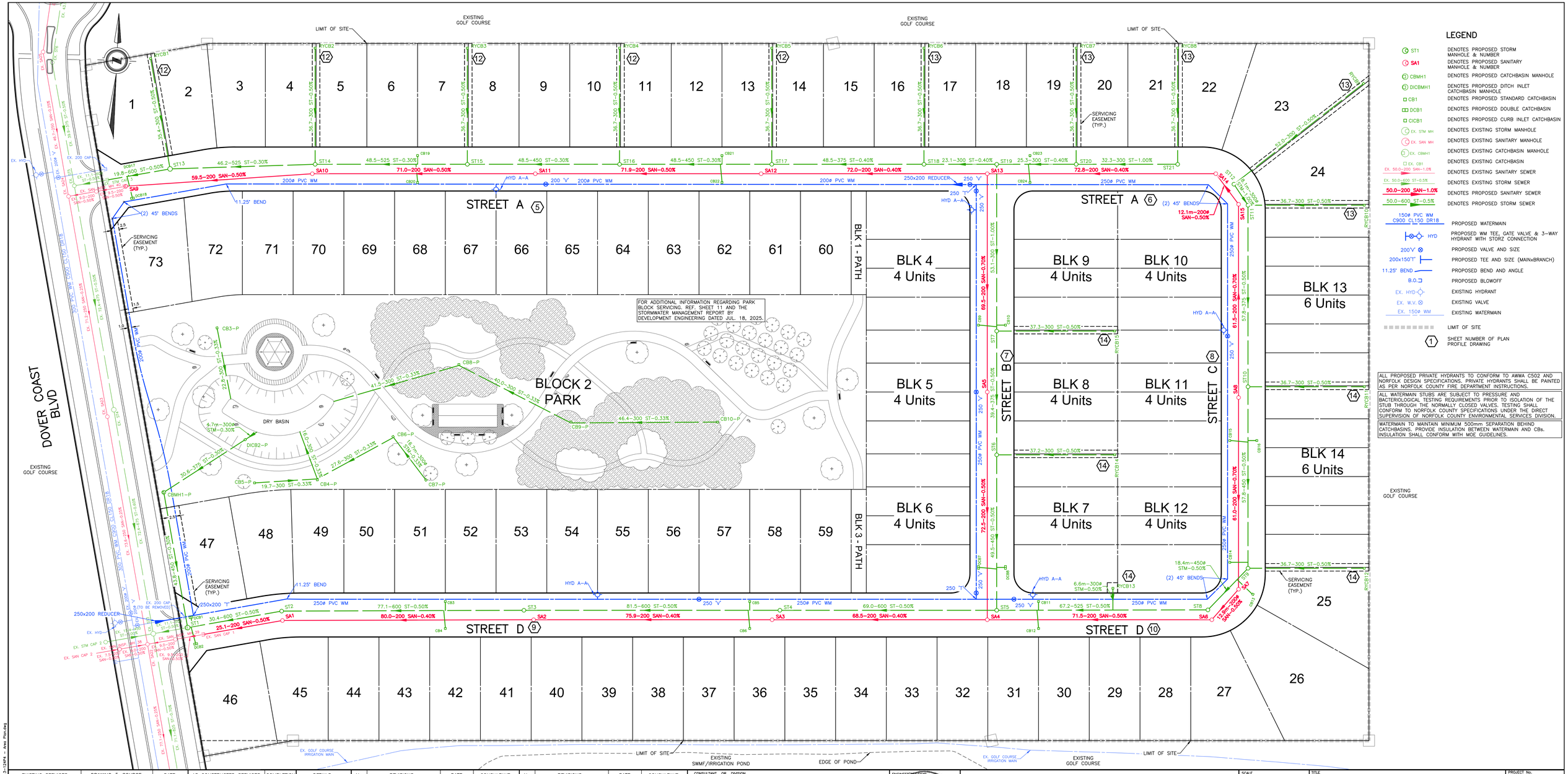
LOCATION PLAN

Consulting Civil Engineers
41 Adelaide St. N., Unit 71
London, Ontario N6B 3P4
Phone (519) 672-8310
Fax (519)672-4182
e-mail: deveng@deveng.net

development engineering (London) Limited
CONSULTING CIVIL ENGINEERS

Norfolk COUNTY

DEL13-124P4 | DOVER COAST



LEGEND

ST1	DENOTES PROPOSED STORM MANHOLE & NUMBER
SA1	DENOTES PROPOSED SANITARY MANHOLE & NUMBER
CBMH1	DENOTES PROPOSED CATCHBASIN MANHOLE
DICBMH1	DENOTES PROPOSED DITCH INLET CATCHBASIN MANHOLE
CB1	DENOTES PROPOSED STANDARD CATCHBASIN
DCB1	DENOTES PROPOSED DOUBLE CATCHBASIN
CICB1	DENOTES PROPOSED CURB INLET CATCHBASIN
EX. STM MH	DENOTES EXISTING STORM MANHOLE
EX. SAN MH	DENOTES EXISTING SANITARY MANHOLE
EX. CBMH1	DENOTES EXISTING CATCHBASIN MANHOLE
EX. CB1	DENOTES EXISTING CATCHBASIN
EX. 50.0–200 SAN–1.0%	DENOTES EXISTING SANITARY SEWER
EX. 50.0–600 ST–0.5%	DENOTES EXISTING STORM SEWER
50.0–200 SAN–1.0%	DENOTES PROPOSED SANITARY SEWER
50.0–600 ST–0.5%	DENOTES PROPOSED STORM SEWER
150ø PVC WM C900 CL150 DR18	PROPOSED WATERMAIN
HYD	PROPOSED WM TEE, GATE VALVE & 3-WAY HYDRANT WITH STORZ CONNECTION
200"V"	PROPOSED VALVE AND SIZE
200x150"T"	PROPOSED TEE AND SIZE (MAINxBRANCH)
11.25° BEND	PROPOSED BEND AND ANGLE
B.O.	PROPOSED BLOWOFF
EX. HYD	EXISTING HYDRANT
EX. W.V.	EXISTING VALVE
EX. 150ø WM	EXISTING WATERMAIN
	LIMIT OF SITE
1	SHEET NUMBER OF PLAN PROFILE DRAWING

ALL PROPOSED PRIVATE HYDRANTS TO CONFORM TO AWWA C502 AND NORFOLK DESIGN SPECIFICATIONS. PRIVATE HYDRANTS SHALL BE PAINTED AS PER NORFOLK COUNTY FIRE DEPARTMENT INSTRUCTIONS.

ALL WATERMAIN STUBS ARE SUBJECT TO PRESSURE AND BACTERIOLOGICAL TESTING REQUIREMENTS PRIOR TO ISOLATION OF THE STUB THROUGH THE NORMALLY CLOSED VALVES. TESTING SHALL CONFORM TO NORFOLK COUNTY SPECIFICATIONS UNDER THE DIRECT SUPERVISION OF NORFOLK COUNTY ENVIRONMENTAL SERVICES DIVISION.

WATERMAIN TO MAINTAIN MINIMUM 500mm SEPARATION BEHIND CATCHBASINS. PROVIDE INSULATION BETWEEN WATERMAIN AND CBs. INSULATION SHALL CONFORM WITH MOE GUIDELINES.

EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION

DETAILS	
DESIGN BY	SW
DRAWN BY	SW
CHECKED BY	DH/JF
F.BK.	***

No.	REVISIONS	DATE	CONSULTANT
1	1ST ENGINEERING SUBMISSION	SEPT. 05/25	DEVENG

No.	REVISIONS	DATE	CONSULTANT

FILE: DEL13-124P4 – AREA PLAN.DWG

CONSULTANT OR DIVISION

London Office
41 Adelaide St. N., Unit 71
(519) 672-8310

Paris Office
31 Mechanic St., Unit 301
(519) 442-1441

development engineering (London) Limited
CONSULTING CIVIL ENGINEERS

ENGINEER'S SEAL
LICENSED PROFESSIONAL ENGINEER
D. J. HOEVENAARS
100140139
Sept 5, 2025
PROVINCE OF ONTARIO

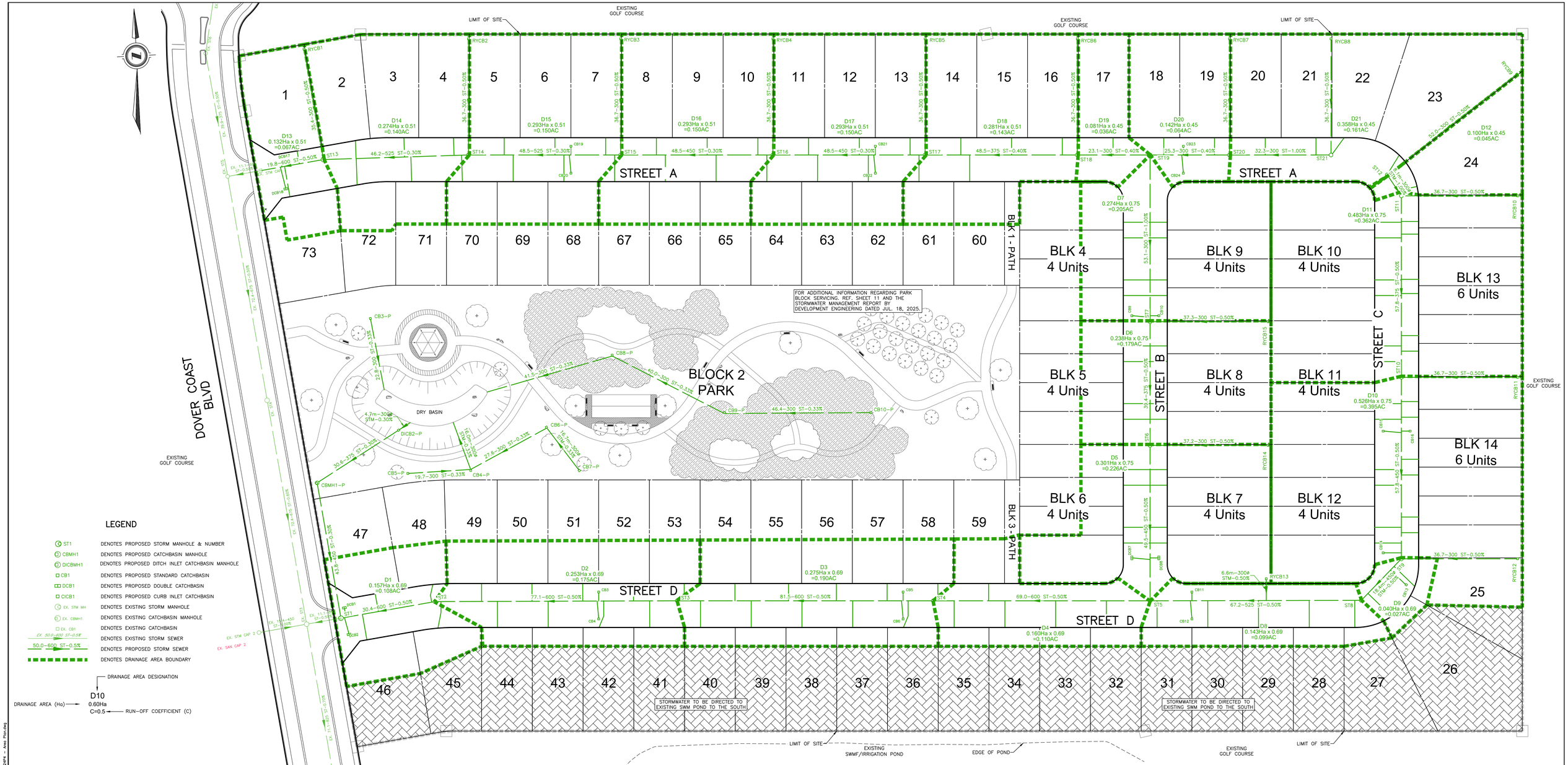
SCALE
SCALE – 1:500
5 0 10m
NTS IF REDUCED FROM 22"X40".

TITLE
DOVER COAST – PHASE 4
PORT DOVER, ONTARIO

MASTER PLAN OF SERVICES

PROJECT No. DEL13–124P4
SHEET No. 1
PLAN FILE No.

plotted: Sep 05/25–3:28pm DEL13-124P4 – Area Plan.dwg



EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION

DETAILS
DESIGN BY SW
DRAWN BY SW
CHECKED BY DH/JF
F.BK. ***

No.	REVISIONS	DATE	CONSULTANT
1	1ST ENGINEERING SUBMISSION	SEPT. 05/25	DEVENG

No.	REVISIONS	DATE	CONSULTANT

FILE: DEL13–124P4 – AREA PLAN.DWG

CONSULTANT OR DIVISION

London Office
41 Adelaide St. N., Unit 71
(519) 672-8310

Paris Office
31 Mechanic St., Unit 301
(519) 442-1441

development engineering (London) Limited
CONSULTING CIVIL ENGINEERS

ENGINEER'S SEAL
LICENSED PROFESSIONAL ENGINEER
D. J. HOEVENAARS
100146139
Sept 5, 2025
PROVINCE OF ONTARIO

SCALE
SCALE – 1:500
5 0 10m
NTS IF REDUCED FROM 22"X40"

TITLE
DOVER COAST – PHASE 4
PORT DOVER, ONTARIO
STORM AREA PLAN

PROJECT No. DEL13–124P4
SHEET No. 2
PLAN FILE No.

plotted: Sep 05/25–3:28pm DEL13–124P4 – Area Plan.dwg

sweheeler Sep.05/25–3:26pm DEL13–124P4 – Area Plan.dwg

EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION

DETAILS	No.	REVISIONS	DATE	CONSULTANT
DESIGN BY SW	1	1ST ENGINEERING SUBMISSION	SEPT. 05/25	DEVENG
DRAWN BY SW				
CHECKED BY DH/JF				
F.BK. ***				

No.	REVISIONS	DATE	CONSULTANT

FILE: DEL13–124P4 – AREA PLAN.DWG

CONSULTANT OR DIVISION

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CONSULTING CIVIL ENGINEERS

ENGINEER'S STAMP
LICENSED PROFESSIONAL ENGINEER
D. J. HOEVENAARS
100149139
Sept 5, 2025
PROVINCE OF ONTARIO

SCALE
SCALE – 1:500
NTS IF REDUCED FROM 22"X40"

TITLE
DOVER COAST – PHASE 4
PORT DOVER, ONTARIO

SANITARY AREA PLAN

PROJECT No. DEL13–124P4
SHEET No. 3
PLAN FILE No.

RUNOFF COEFFICIENT 'C'

PARKS & PLAYGROUNDS	0.25
RESIDENTIAL - SINGLE/SEMI	0.45
- ROWHOUSING	0.75

FLOW Q = 2.78 ACI
Q = PEAK FLOW IN LITRES PER SECOND (l/s)
A = AREA IN HECTARES (ha)
C = RUNOFF COEFFICIENT
i = RAINFALL INTENSITY IN MILLIMETERS PER HOUR (mm/hr)
RETURN PERIOD= 5 years

STORM SEWER DESIGN SHEET
NORFOLK COUNTY
DEL13-124P4

DRAINAGE AREA: 7.65 ha
DESIGNED BY: SW
CHECKED BY: DH
DATE: July 15, 2025

LOCATION			AREA			A X C						RAINFALL INTENSITY			SEWER DESIGN								PROFILE				
												TIME ENTRY														INVERT ELEVATION	
STREET	FROM	TO	ID	DELTA AREA ha.	TOTAL AREA ha.	'C'	INCR A x C	TOTAL SECTION	TOTAL LATERAL	TOTAL SEWER	TOTAL 2.78 x AxC	SECT. min.	PASTE min.	INTENS. 'i' mm/hr	Q l/s	PIPE Dia. Mm	DESIGN SLOPE %	n	CAPACITY l/s	ACTUAL VELOCITY m./s.	LENGTH m	TIME OF FLOW minutes	HEAD LOSSES m	DROP IN MH m	SEWER FALL m	U.S. m	D.S. m
STREET A	ST21	ST20	D21	0.358	0.358	0.45	0.161	0.000		0.161	0.448		15.00	76.40	34.23	300	1.00	0.013	96.70	1.218	32.3	0.44	0.000	0.020	0.323	190.829	190.506
STREET A	ST20	ST19	D20	0.142	0.500	0.45	0.064	0.161		0.225	0.626	0.44	15.44	75.12	47.02	300	0.40	0.013	61.16	0.957	25.3	0.44	0.000	0.020	0.101	190.486	190.385
STREET A	ST19	ST18	D19	0.081	0.581	0.45	0.036	0.225		0.261	0.727	0.44	15.88	73.91	53.73	300	0.40	0.013	61.16	0.982	23.1	0.39	0.000	0.075	0.093	190.365	190.273
STREET A	ST18	ST17	D18	0.281	0.862	0.51	0.143	0.261		0.405	1.125	0.39	16.27	72.83	81.93	375	0.40	0.013	110.87	1.105	48.5	0.73	0.000	0.075	0.194	190.198	190.004
STREET A	ST17	ST16	D17	0.293	1.155	0.51	0.150	0.405		0.554	1.541	0.73	17.00	70.95	109.33	450	0.30	0.013	156.16	1.074	48.5	0.75	0.000	0.020	0.145	189.929	189.784
STREET A	ST16	ST15	D16	0.293	1.448	0.51	0.150	0.554		0.704	1.957	0.75	17.75	69.14	135.30	450	0.30	0.013	156.16	1.111	48.5	0.73	0.000	0.075	0.145	189.764	189.618
STREET A	ST15	ST14	D15	0.293	1.742	0.51	0.150	0.704		0.853	2.372	0.73	18.48	67.48	160.06	525	0.30	0.013	235.58	1.185	48.5	0.68	0.000	0.020	0.145	189.543	189.398
STREET A	ST14	ST13	D14	0.274	2.016	0.51	0.140	0.853		0.993	2.761	0.68	19.16	66.02	182.27	525	0.30	0.013	235.58	1.204	46.2	0.64	0.019	0.075	0.139	189.378	189.238
STREET A	ST13	EX. STM CAP 3	D13	0.132	2.148	0.51	0.067	0.993		1.060	2.948	0.64	19.80	64.71	190.76	600	0.50	0.013	434.16	1.471	19.8	0.22	0.000		0.099	189.163	189.064
STREET C	ST12	ST11	D12	0.100	0.100	0.45	0.045	0.000		0.045	0.125		15.00	76.40	9.55	300	1.00	0.013	96.70	0.861	8.1	0.16	0.054	0.075	0.081	190.996	190.915
STREET C	ST11	ST10	D11	0.483	0.583	0.75	0.362	0.045		0.407	1.132	0.16	15.16	75.93	85.95	375	0.50	0.013	123.96	1.226	57.8	0.79	0.000	0.075	0.289	190.840	190.551
STREET C	ST10	ST9	D10	0.526	1.109	0.75	0.395	0.407		0.802	2.229	0.79	15.95	73.69	164.26	450	0.50	0.013	201.60	1.414	57.8	0.68	0.072	0.072	0.289	190.476	190.187
STREET C	ST9	ST8	D9	0.039	1.148	0.69	0.027	0.802		0.829	2.304	0.68	16.63	71.89	165.63	450	0.50	0.013	201.60	1.416	18.4	0.22	0.081	0.081	0.092	190.115	190.023
STREET D	ST8	ST5	D8	0.143	1.291	0.69	0.099	0.829		0.927	2.578	0.22	16.85	71.35	183.94	525	0.50	0.013	304.13	1.497	67.2	0.75	0.000	0.020	0.336	189.942	189.606
STREET B	ST19.S	ST7	D7	0.274	0.274	0.75	0.205	0.000		0.205	0.571		15.00	76.40	43.63	300	1.00	0.013	96.70	1.323	53.1	0.67	0.000	0.075	0.531	190.861	190.330
STREET B	ST7	ST6	D6	0.238	0.512	0.75	0.179	0.205		0.384	1.067	0.67	15.67	74.47	79.45	375	0.50	0.013	123.96	1.211	39.4	0.54	0.000	0.075	0.197	190.255	190.058
STREET B	ST6	ST5	D5	0.301	0.813	0.75	0.226	0.384		0.610	1.695	0.54	16.21	72.99	123.71	450	0.50	0.013	201.60	1.355	49.5	0.61	0.146	0.150	0.248	189.983	189.736
STREET D	ST5	ST4	D4	0.160	2.264	0.69	0.110	0.927	0.610	1.647	4.580	Tc1	17.29	70.24	321.68	600	0.50	0.013	434.16	1.690	69.0	0.68	0.000	0.020	0.345	189.586	189.241
STREET D	ST4	ST3	D3	0.275	2.539	0.69	0.190	1.647		1.837	5.107	0.68	17.97	68.63	350.48	600	0.50	0.013	434.16	1.710	81.5	0.79	0.000	0.020	0.407	189.221	188.814
STREET D	ST3	ST2	D2	0.253	2.792	0.69	0.175	1.837		2.012	5.593	0.79	18.76	66.89	374.11	600	0.50	0.013	434.16	1.734	77.1	0.74	0.000	0.020	0.386	188.794	188.408
STREET D	ST2	ST1	D1	0.157	2.949	0.69	0.108	2.012		2.120	5.894	0.74	19.50	65.33	385.08	600	0.50	0.013	434.16	1.749	30.4	0.29	0.000	0.020	0.152	188.388	188.236
BLOCK 2 - PARK	CBMH1-P	ST1		2.549	2.549	0.25	0.637	0.000		0.637	1.772		15.00	76.40	135.38	450	0.30	0.013	156.16	1.111	43.8	0.66	0.000		0.131	188.667	188.536

Tc 1 17.29

$$T_c = \frac{(T_{c1} * Q_1) + (T_{c2} * Q_2)}{(Q_1 + Q_2)}$$

$$= \frac{(17.60 \times 183.94) + (16.82 \times 123.71)}{(183.94 + 123.71)}$$

$$= 17.29 \text{ min}$$

$T_{c1} = 16.85 + 0.75 = 17.60$

$T_{c2} = 16.21 + 0.61 = 16.82$

RESIDENTIAL POPULATIONS DENSITIES

AREA / ZONING BASIS
LOW DENSITY (SINGLE FAMILY) - 25 UNITS PER HECTARE @ 3 PEOPLE / UNIT
MEDIUM DENSITY (MULTI-FAMILY) - 75 UNITS PER HECTARE @ 2.4 PEOPLE / UNIT
HIGH DENSITY - 150 UNITS PER HECTARE @ 1.6 PEOPLE / UNIT
LOT BASIS
SINGLE FAMILY AND SEMI-DETACHED - 3 PEOPLE PER UNIT
TOWNHOMES - 2.4 PEOPLE PER UNIT

SANITARY SEWER DESIGN SHEET
NORFOLK COUNTY
DOVER COAST PHASE 4

$$Q(peak\ flow\ L/s) = \left(\frac{(population\ x\ per\ capita\ flow\ x\ peaking\ factor\ x\ uncertainty)}{24\ x\ 60\ x\ 60}\right) + infiltration$$

Per capita flow = 285 litres/capita/day
Peaking Factor = Harmon Formula $M = 1 + \left(\frac{14}{4 + P^{0.5}}\right)$
Uncertain Development Factor = 1.0 or 1.1 (situation dependent)
Infiltration Allowance = 24192 litres/hectare/day (0.28L/ha/s)

SANITARY AREA: 7.23 ha
DESIGNED BY:SW
CHECKED BY: DH
DATE: July 15, 2025

LOCATION				AREA			POPULATION					SEWAGE FLOW				SEWER DESIGN					PROFILE					
AREA ID	STREET	FROM	TO	NET OR GROSS	Δ AREA Ha.	TOTAL AREA Ha.	PER Ha.	PER LOT	NO. OF LOTS	Δ POP.	TOTAL POP.	INFILTRATION (l/s)	PEAKING FACTOR (M)	SEWAGE (l/s)	TOTAL (l/s)	"n"	SIZE (mm)	DESIGN SLOPE %	CAPACITY (l/s)	VELOCITY (m/s)	LENGTH (m/s)	DROP IN D.S. MH (m)	FALL IN SEWER (m)	HEAD LOSS (m)	INVERT U.S. m	ELEV. D.S. m
A16	STREET C	SA8.N	SA15	G	0.485	0.485		2.4	12	29	29	0.136	4.358	0.414	0.591	0.013	200	0.70	27.442	0.873	61.5	0.050	0.431		190.299	189.868
A15	STREET A	SA15	SA14	G	0.225	0.710		3.0	2	6	35	0.199	4.344	0.499	0.748	0.013	200	0.50	23.193	0.738	12.1	0.050	0.061		189.818	189.758
A14	STREET A	SA14	SA13	G	0.379	1.089		3.0	5	15	50	0.305	4.315	0.709	1.085	0.013	200	0.40	20.745	0.660	72.8	0.020	0.291		189.708	189.417
A13	STREET A	SA13	SA12	G	0.433	1.522		3.0	6	18	68	0.426	4.286	0.959	1.481	0.013	200	0.40	20.745	0.660	72.0	0.020	0.288		189.397	189.109
A12	STREET A	SA12	SA11	G	0.582	2.104		3.0	9	27	95	0.589	4.250	1.329	2.051	0.013	200	0.50	23.193	0.738	71.9	0.020	0.359		189.089	188.729
A11	STREET A	SA11	SA10	G	0.579	2.683		3.0	9	27	122	0.751	4.219	1.695	2.616	0.013	200	0.50	23.193	0.738	71.0	0.020	0.355		188.709	188.355
A10	STREET A	SA10	SA9	G	0.517	3.200		3.0	7	21	143	0.896	4.198	1.977	3.071	0.013	200	0.50	23.193	0.738	59.5	0.050	0.298		188.335	188.037
	STREET C		SA7					3.0	1	3	3															
A9	STREET C	SA8.S	SA7	G	0.556	0.556		2.4	12	29	29	0.156	4.358	0.414	0.611	0.013	200	0.70	27.442	0.873	61.0	0.050	0.427		189.689	189.262
A8	STREET D	SA7	SA6	G	0.137	0.693		3.0	1	3	35	0.194	4.344	0.499	0.743	0.013	200	0.50	23.193	0.738	12.9	0.050	0.065		189.212	189.147
A7	STREET D	SA6	SA4	G	0.383	1.076		3.0	5	15	50	0.301	4.315	0.709	1.081	0.013	200	0.50	23.193	0.738	71.5	0.020	0.357		189.097	188.740
A6	STREET B	SA13.S	SA5	G	0.515	0.515		2.4	12	29	29	0.144	4.358	0.414	0.599	0.013	200	0.70	27.442	0.873	69.5	0.020	0.487		189.669	189.182
A5	STREET B	SA5	SA4	G	0.517	1.032		2.4	12	29	58	0.289	4.302	0.817	1.188	0.013	200	0.50	23.193	0.738	72.5	0.080	0.363		189.163	188.800
A4	STREET D	SA4	SA3	G	0.431	2.539		3.0	6	18	125	0.711	4.215	1.744	2.629	0.013	200	0.40	20.745	0.660	68.5	0.020	0.274		188.720	188.446
A3	STREET D	SA3	SA2	G	0.582	3.121		3.0	9	27	152	0.874	4.189	2.106	3.191	0.013	200	0.40	20.745	0.660	75.9	0.020	0.304		188.426	188.122
A2	STREET D	SA2	SA1	G	0.657	3.778		3.0	10	30	182	1.058	4.162	2.504	3.812	0.013	200	0.40	20.745	0.660	80.0	0.020	0.320		188.102	187.783
A1	STREET D	SA1	SAN STUB 1	G	0.254	4.032		3.0	3	9	191	1.129	4.155	2.623	4.014	0.013	200	0.50	23.193	0.738	25.1	0.050	0.126		187.763	187.637

EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION

DETAILS
DESIGN BY SW
DRAWN BY SW
CHECKED BY DH/JF
F.B.K. ***

No.	REVISIONS	DATE	CONSULTANT
1	1ST ENGINEERING SUBMISSION	SEPT. 05/25	DEVENG

No.	REVISIONS	DATE	CONSULTANT

FILE: DEL13-124P4 - AREA PLAN.DWG

CONSULTANT OR DIVISION

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development engineering (London) Limited
CONSULTING CIVIL ENGINEERS

ENGINEER'S SEAL: LICENSED PROFESSIONAL ENGINEER, D. J. HOEVENAARS, 100149139, Sept 5, 2025, PROVINCE OF ONTARIO

SCALE

TITLE
DOVER COAST – PHASE 4
PORT DOVER, ONTARIO

STORM AND SANITARY DESIGN SHEETS

PROJECT No. DEL13-124P4
SHEET No. 4
PLAN FILE No.

LEGEND

- ST1 — PROPOSED STORM MANHOLE
- SA1 — PROPOSED SANITARY MANHOLE
- CBMH1 — PROPOSED CATCHBASIN MANHOLE
- CB1 — PROPOSED STANDARD CATCHBASIN
- TICB1 — PROPOSED TWIN INLET CATCHBASIN
- 50.0-200 SAN-1.0% — PROPOSED SANITARY SEWER
- 50.0-600 ST-0.5% — PROPOSED STORM SEWER
- 200ø PVC WM — PROPOSED WATERMAIN
- W.V. — PROPOSED WATER VALVE
- HYD — PROPOSED HYDRANT TEE, 150 GATE VALVE & 3-WAY HYDRANT WITH STORZ CONNECTION
- ® — PROPOSED SIDEWALK RAMP LOCATION c/w TACTILE PLATES (PER SECTION 3.4 – NORFOLK COUNTY ACCESSIBILITY DESIGN GUIDELINES)
- SL — PROPOSED STREET LIGHT LOCATION
- CMB — PROPOSED LOCATION FOR COMMUNITY MAILBOX
- PROPOSED TRANSFORMER AND CONCRETE PAD

SITE BENCHMARKS:

BM1 – CUT CROSS SET IN TOP WEST CURB OF DOVER COAST BLVD AT 1ST HYDRANT #361 NORTH OF NEW LAKESHORE RD
ELEVATION = 189.760 METRES

BM2 – CUT CROSS SET IN TOP NW CORNER OF CONCRETE PAD FOR TRANSFORMER #60140 LOCATED ON THE EAST SIDE OF DOVER COAST BLVD, NW OF THE NW CORNER OF THE POND SOUTH OF PHASE 4
ELEVATION = 190.266 METRES

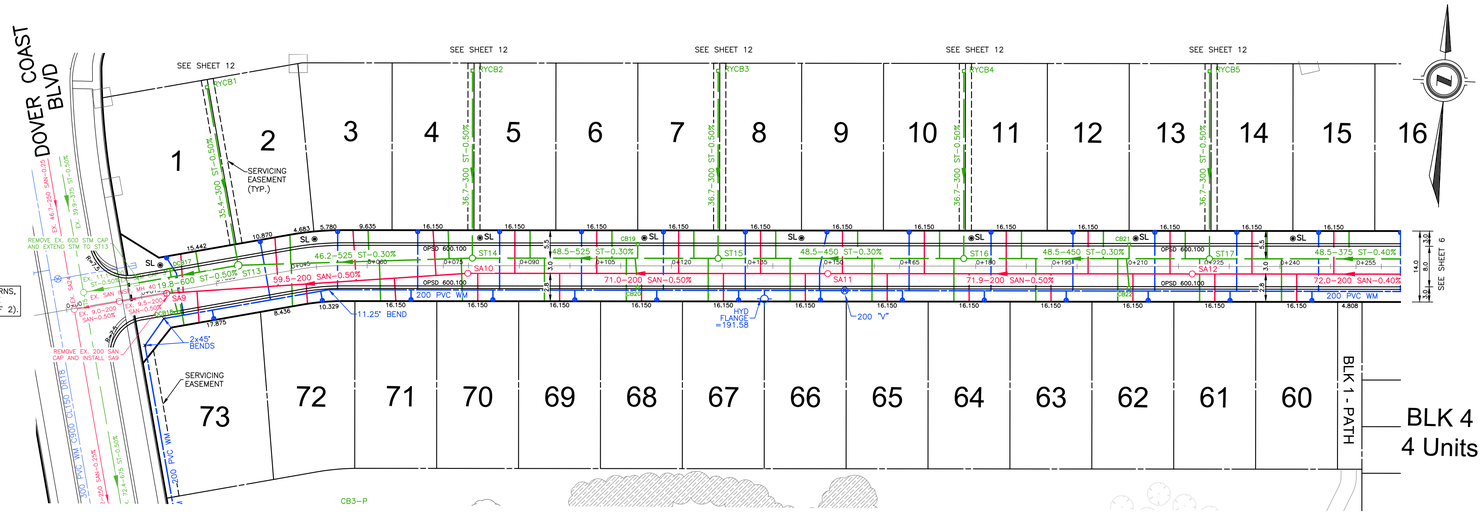
BM3 – TOP SPINDLE OF HYDRANT #368 LOCATED ON THE WEST SIDE OF DOVER COAST BLVD, 2ND HYDRANT NORTH OF NEW LAKESHORE RD.
ELEVATION = 191.396 METRES

BM4 – CUT CROSS SET TOP WEST CURB OF DOVER COAST BLVD AT HYDRANT #368, 2ND HYDRANT NORTH OF NEW LAKESHORE BLVD
ELEVATION = 190.413 METRES

BM5 – CUT CROSS SET IN TOP EAST CURB OF DOVER COAST BLVD AT 1ST CATCH BASIN NORTH OF SOUTH FUTURE EAST–WEST ROAD INTO PHASE 4
ELEVATION = 190.640 METRES

BM6 – CUT CROSS SET IN WEST CURB OF DOVER COAST BLVD AT HYDRANT #369, 3RD NORTH OF NEW LAKESHORE BLVD
ELEVATION = 191.152 METRES

CURB AND GUTTER OPSD 600.100



REFER TO SHEET 17 FOR STREET TOWN STANDARD SERVICING LOCATIONS DETAIL.

- SANITARY PDC's (MIN. 125mm DIAMETER; SDR 28 PVC) SHALL BE CONSTRUCTED TO MINIMUM 2.25m COVER BELOW FINISHED GRADE AT PROPERTY LINE UNLESS OTHERWISE NOTED.
- STORM PDC's (MIN. 100mm DIAMETER; SDR 28 PVC) SHALL BE CONSTRUCTED TO MINIMUM 1.50m COVER BELOW FINISHED GRADE AT PROPERTY LINE UNLESS OTHERWISE NOTED.
- WATER SERVICES SHALL BE 25.4mm (1") CSA–B137.5 PEX CONSTRUCTED TO MINIMUM 1.70m COVER BELOW FINISHED GRADE AT PROPERTY LINE.

50mm (2") THICK INSULATION OVER WATERMAIN PER MOE DESIGN GUIDELINES FOR DRINKING–WATER SYSTEMS 12.7.2.3 AND NORFOLK WATER INSULATION DETAIL UNTIL 1.2m OF COVER FROM SPRINGLINE IS ACHIEVED, REFERENCE DETAIL ON SHEET 17.

WATER SERVICES CROSSING ABOVE STORM SEWER MUST BE INSULATED PER OPSD 1109.030 WHERE MIN. 1.2m COVER IS NOT ACHIEVED AND/OR 0.5m OR LESS SEPARATION FROM THE INVERT OF THE SEWER OR STRUCTURE IS NOT ACHIEVED

PRIOR TO CONSTRUCTION THE OWNER'S CONTRACTOR SHALL OBTAIN LOCATES FOR, EXPOSE AND CONFIRM LOCATION OF ALL EXISTING UNDERGROUND UTILITIES WITHIN THE LIMIT OF CONSTRUCTION. OWNER'S CONTRACTOR SHALL SUPPORT EXISTING UNDERGROUND UTILITIES AS REQUIRED TO THE SATISFACTION OF THE UTILITY OWNER

ALL SUBGRADE TO BE THOROUGHLY PROOF–ROLLED TO MEET 98% SPMDD AND, WHERE NECESSARY AT THE DISCRETION OF THE ON–SITE GEOTECHNICAL ENGINEER, SUB–EXCAVATED AND REPLACED WITH APPROVED FILL AT THE RECOMMENDATION OF THE ON–SITE GEOTECHNICAL ENGINEER. ALL SUBGRADE MUST BE INSPECTED AND APPROVED BY A GEOTECHNICAL ENGINEER PRIOR TO BACKFILLING.

ROTATE MH CONES TO AVOID CONFLICTS WITH CURBS

CATCHBASINS WITHIN HARD SURFACES REQUIRE SUBDRAINS WHICH SHALL BE 150mmø, MIN. 3.0m LONG, PERFORATED PVC PIPE WITH NON–WOVEN GEOTEXTILE FILTER SOCK (TERRAFIX 200R) AS PER DETAIL ON SHEET 17. PIPE ENDS TO BE CAPPED.

CATCHBASIN NOTES:

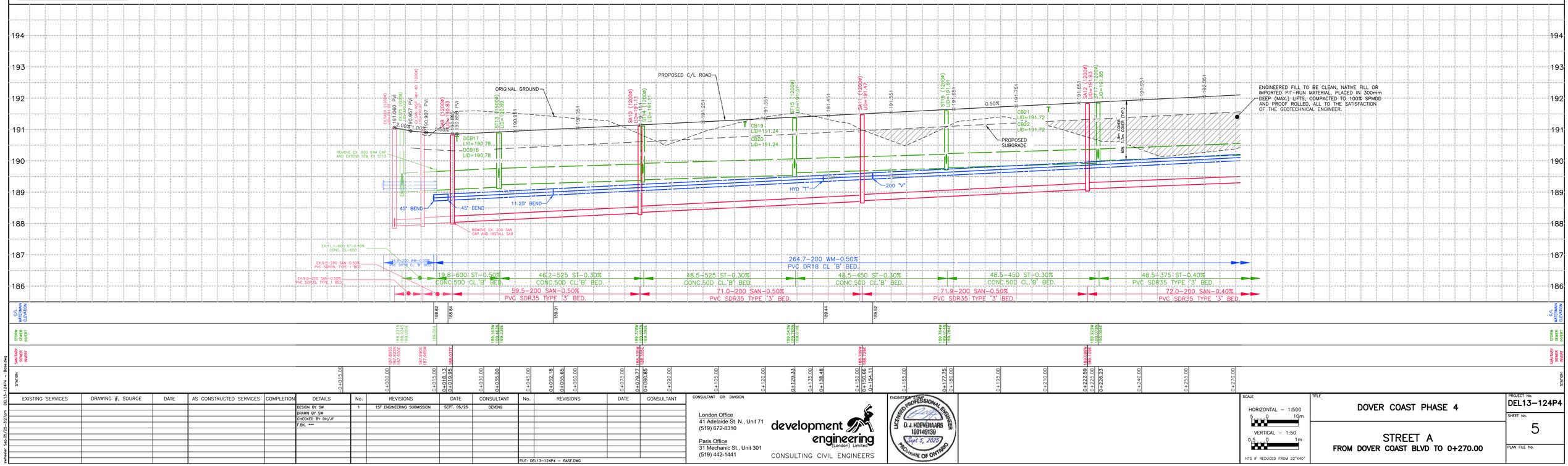
- ALL CATCHBASINS SHALL BE SETBACK. FRONT INSIDE FACE ALIGNED WITH EDGE OF PAVEMENT.
- CURB SETBACKS TO BE CONSTRUCTED PER DETAIL ON SHEET 17.
- LID ELEVATION SET TO FINISHED GRADE.
- 50mm DRAIN TO BE PROVIDED IN BASE ASPHALT.
- CATCHBASIN GRATE SHALL BE OPSD 400.110.
- SINGLE INLET CATCHBASIN CONNECTIONS SHALL BE 250mm.
- TWIN INLET CATCHBASIN CONNECTIONS SHALL BE 300mm.

ALL WATERMAIN CROSSINGS AND VERTICAL OFFSETS ABOVE OR BELOW SEWERS SHALL HAVE A MINIMUM OF 0.5m VERTICAL SEPARATION.

PARSON INSERTS ARE REQUIRED IN ALL MANHOLES UNTIL COMPLETION OF BASE COAT ASPHALT.

OWNER'S CONTRACTOR TO INSTALL CLAY COLLARS ON SANITARY SEWER IN WET CONDITIONS AT THE DIRECTION OF THE GEOTECHNICAL ENGINEER. SEE DETAIL ON SHEET 17.

STREET A



EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION

DETAILS	No.	REVISIONS	DATE	CONSULTANT
DESIGN BY SW	1	1ST ENGINEERING SUBMISSION	SEPT. 05/25	DEVENG
DRAWN BY SW				
CHECKED BY DH/JF				
F.BK. ***				

No.	REVISIONS	DATE	CONSULTANT

FILE: DEL13–124P4 – BASE.DWG

CONSULTANT OR DIVISION

London Office
41 Adelaide St. N., Unit 71
(519) 672-8310

Paris Office
31 Mechanic St., Unit 301
(519) 442-1441

development engineering (London) Limited
CONSULTING CIVIL ENGINEERS

ENGINEER'S STAMP
LICENSED PROFESSIONAL ENGINEERS
D. J. KOEVEMAARS
100149139
Sept 5, 2025
PROVINCE OF ONTARIO

SCALE
HORIZONTAL – 1:500
5 0 10m
VERTICAL – 1:50
0.5 0 1m
NTS IF REDUCED FROM 22"X40"

TITLE
DOVER COAST PHASE 4
STREET A
FROM DOVER COAST BLVD TO 0+270.00

PROJECT No. DEL13–124P4
SHEET No. 5
PLAN FILE No.

plotted: Sep 05/25–1:27pm DEL13–124P4 – Base.dwg

LEGEND

- ST1 — PROPOSED STORM MANHOLE
- SA1 — PROPOSED SANITARY MANHOLE
- CBMH1 — PROPOSED CATCHBASIN MANHOLE
- CB1 — PROPOSED STANDARD CATCHBASIN
- TICB1 — PROPOSED TWIN INLET CATCHBASIN
- 50.0–200 SAN–1.0% — PROPOSED SANITARY SEWER
- 50.0–600 ST–0.5% — PROPOSED STORM SEWER
- 200ø PVC WM — PROPOSED WATERMAIN
- W.V. — PROPOSED WATER VALVE
- HYD — PROPOSED HYDRANT TEE, 150 GATE VALVE & 3–WAY HYDRANT WITH STORZ CONNECTION
- ® — PROPOSED SIDEWALK RAMP LOCATION c/w TACTILE PLATES (PER SECTION 3.4 – NORFOLK COUNTY ACCESSIBILITY DESIGN GUIDELINES)
- SL — PROPOSED STREET LIGHT LOCATION
- CMB — PROPOSED LOCATION FOR COMMUNITY MAILBOX
- PROPOSED TRANSFORMER AND CONCRETE PAD

SITE BENCHMARKS:

BM1 – CUT CROSS SET IN TOP WEST CURB OF DOVER COAST BLVD AT 1ST HYDRANT #361 NORTH OF NEW LAKESHORE RD
ELEVATION = 189.760 METRES

BM2 – CUT CROSS SET IN TOP NW CORNER OF CONCRETE PAD FOR TRANSFORMER #60140 LOCATED ON THE EAST SIDE OF DOVER COAST BLVD, NW OF THE NW CORNER OF THE POND SOUTH OF PHASE 4
ELEVATION = 190.266 METRES

BM3 – TOP SPINDLE OF HYDRANT #368 LOCATED ON THE WEST SIDE OF DOVER COAST BLVD, 2ND HYDRANT NORTH OF NEW LAKESHORE RD.
ELEVATION = 191.396 METRES

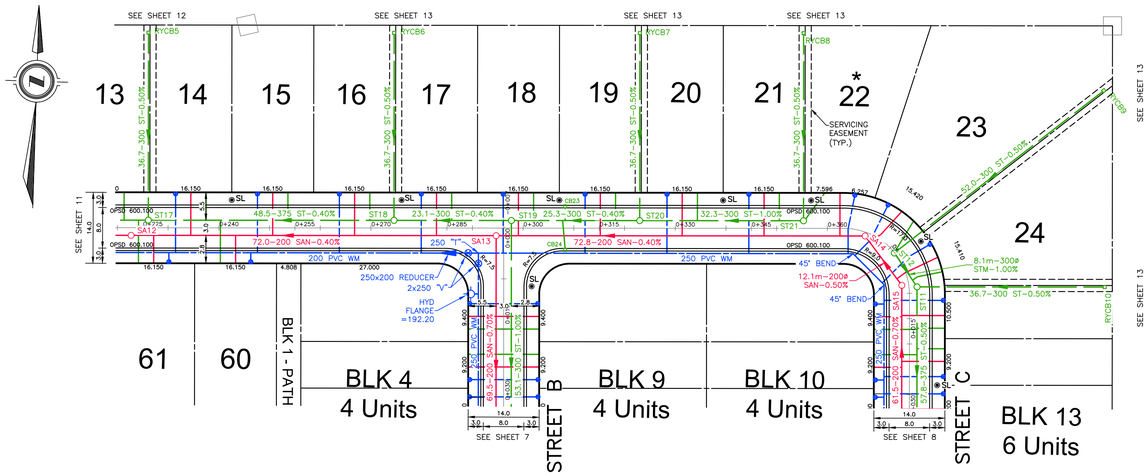
BM4 – CUT CROSS SET TOP WEST CURB OF DOVER COAST BLVD AT HYDRANT #368, 2ND HYDRANT NORTH OF NEW LAKESHORE BLVD
ELEVATION = 190.413 METRES

BM5 – CUT CROSS SET IN TOP EAST CURB OF DOVER COAST BLVD AT 1ST CATCH BASIN NORTH OF SOUTH FUTURE EAST–WEST ROAD INTO PHASE 4
ELEVATION = 190.640 METRES

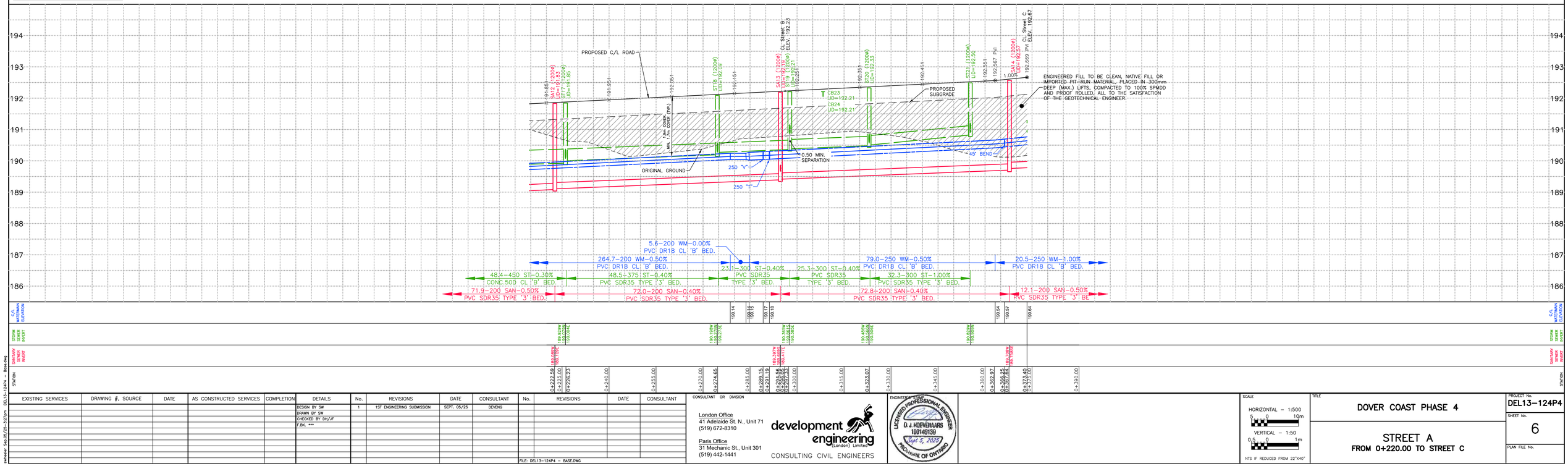
BM6 – CUT CROSS SET IN WEST CURB OF DOVER COAST BLVD AT HYDRANT #369, 3RD NORTH OF NEW LAKESHORE BLVD
ELEVATION = 191.152 METRES

CURB AND GUTTER OPSD 600.100

* DENOTES LOTS WHERE WATER SERVICE IS REQUIRED TO BE 3.0m RIGHT OF CENTRELINE OF SANITARY SERVICE (NON–STANDARD LOCATION AS PER NORFOLK COUNTY DESIGN CRITERIA SECTION 7.12.05).



STREET A



REFER TO SHEET 17 FOR STREET TOWN STANDARD SERVICING LOCATIONS DETAIL.

- SANITARY PDC's (MIN. 125mm DIAMETER; SDR 28 PVC) SHALL BE CONSTRUCTED TO MINIMUM 2.25m COVER BELOW FINISHED GRADE AT PROPERTY LINE UNLESS OTHERWISE NOTED.
- STORM PDC's (MIN. 100mm DIAMETER; SDR 28 PVC) SHALL BE CONSTRUCTED TO MINIMUM 1.50m COVER BELOW FINISHED GRADE AT PROPERTY LINE UNLESS OTHERWISE NOTED.
- WATER SERVICES SHALL BE 25.4mm (1") CSA–B137.5 PEX CONSTRUCTED TO MINIMUM 1.70m COVER BELOW FINISHED GRADE AT PROPERTY LINE.

50mm (2") THICK INSULATION OVER WATERMAIN PER MOE DESIGN GUIDELINES FOR DRINKING–WATER SYSTEMS 12.7.2.3 AND NORFOLK WATER INSULATION DETAIL UNTIL 1.2m OF COVER FROM SPRINGLINE IS ACHIEVED, REFERENCE DETAIL ON SHEET 17.

WATER SERVICES CROSSING ABOVE STORM SEWER MUST BE INSULATED PER OPSD 1109.030 WHERE MIN. 1.2m COVER IS NOT ACHIEVED AND/OR 0.5m OR LESS SEPARATION FROM THE INVERT OF THE SEWER OR STRUCTURE IS NOT ACHIEVED

PRIOR TO CONSTRUCTION THE OWNER'S CONTRACTOR SHALL OBTAIN LOCATES FOR, EXPOSE AND CONFIRM LOCATION OF ALL EXISTING UNDERGROUND UTILITIES WITHIN THE LIMIT OF CONSTRUCTION. OWNER'S CONTRACTOR SHALL SUPPORT EXISTING UNDERGROUND UTILITIES AS REQUIRED TO THE SATISFACTION OF THE UTILITY OWNER

ALL SUBGRADE TO BE THOROUGHLY PROOF–ROLLED TO MEET 98% SPMDD AND, WHERE NECESSARY AT THE DISCRETION OF THE ON–SITE GEOTECHNICAL ENGINEER, SUB–EXCAVATED AND REPLACED WITH APPROVED FILL AT THE RECOMMENDATION OF THE ON–SITE GEOTECHNICAL ENGINEER. ALL SUBGRADE MUST BE INSPECTED AND APPROVED BY A GEOTECHNICAL ENGINEER PRIOR TO BACKFILLING.

ROTATE MH CONES TO AVOID CONFLICTS WITH CURBS

CATCHBASINS WITHIN HARD SURFACES REQUIRE SUBDRAINS WHICH SHALL BE 150mmø, MIN. 3.0m LONG, PERFORATED PVC PIPE WITH NON–WOVEN GEOTEXTILE FILTER SOCK (TERRAFIX 200R) AS PER DETAIL ON SHEET 17. PIPE ENDS TO BE CAPPED.

CATCHBASIN NOTES:

- ALL CATCHBASINS SHALL BE SETBACK. FRONT INSIDE FACE ALIGNED WITH EDGE OF PAVEMENT.
- CURB SETBACKS TO BE CONSTRUCTED PER DETAIL ON SHEET 17.
- LID ELEVATION SET TO FINISHED GRADE.
- 50mm DRAIN TO BE PROVIDED IN BASE ASPHALT.
- CATCHBASIN GRATE SHALL BE OPSD 400.110.
- SINGLE INLET CATCHBASIN CONNECTIONS SHALL BE 250mm.
- TWIN INLET CATCHBASIN CONNECTIONS SHALL BE 300mm.

ALL WATERMAIN CROSSINGS AND VERTICAL OFFSETS ABOVE OR BELOW SEWERS SHALL HAVE A MINIMUM OF 0.5m VERTICAL SEPARATION.

PARSON INSERTS ARE REQUIRED IN ALL MANHOLES UNTIL COMPLETION OF BASE COAT ASPHALT.

OWNER'S CONTRACTOR TO INSTALL CLAY COLLARS ON SANITARY SEWER IN WET CONDITIONS AT THE DIRECTION OF THE GEOTECHNICAL ENGINEER. SEE DETAIL ON SHEET 17.

EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION

DETAILS
DESIGN BY SW
DRAWN BY SW
CHECKED BY DH/JF
F.BK. ***

No.	REVISIONS	DATE	CONSULTANT
1	1ST ENGINEERING SUBMISSION	SEPT. 05/25	DEVENG

No.	REVISIONS	DATE	CONSULTANT

FILE: DEL13–124P4 – BASE.DWG

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TITLE
DOVER COAST PHASE 4
STREET A
FROM 0+220.00 TO STREET C

PROJECT No. DEL13–124P4
SHEET No. 6
PLAN FILE No.

plotted: Sep 05/25–1:27pm DEL13–124P4 – Base.dwg

LEGEND

ST1	PROPOSED STORM MANHOLE
SA1	PROPOSED SANITARY MANHOLE
CBMH1	PROPOSED CATCHBASIN MANHOLE
CB1	PROPOSED STANDARD CATCHBASIN
TICB1	PROPOSED TWIN INLET CATCHBASIN
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CMB	PROPOSED LOCATION FOR COMMUNITY MAILBOX
	PROPOSED TRANSFORMER AND CONCRETE PAD

SITE BENCHMARKS:

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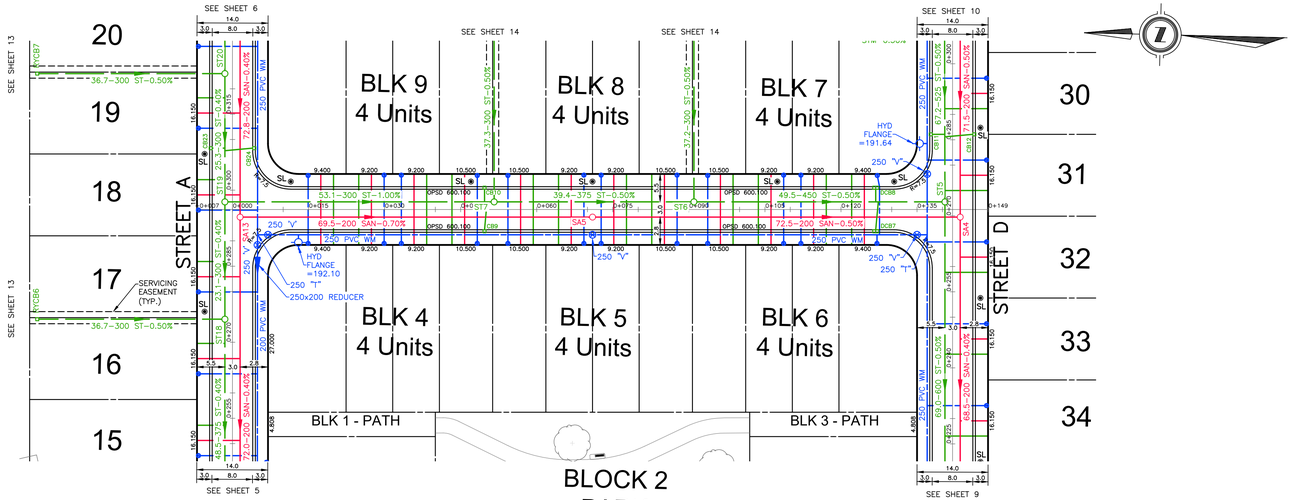
CURB AND GUTTER OPSD 600.100



BLOCK 2
PARK
STREET B

REFER TO SHEET 17 FOR STREET TOWN STANDARD SERVICING LOCATIONS DETAIL.

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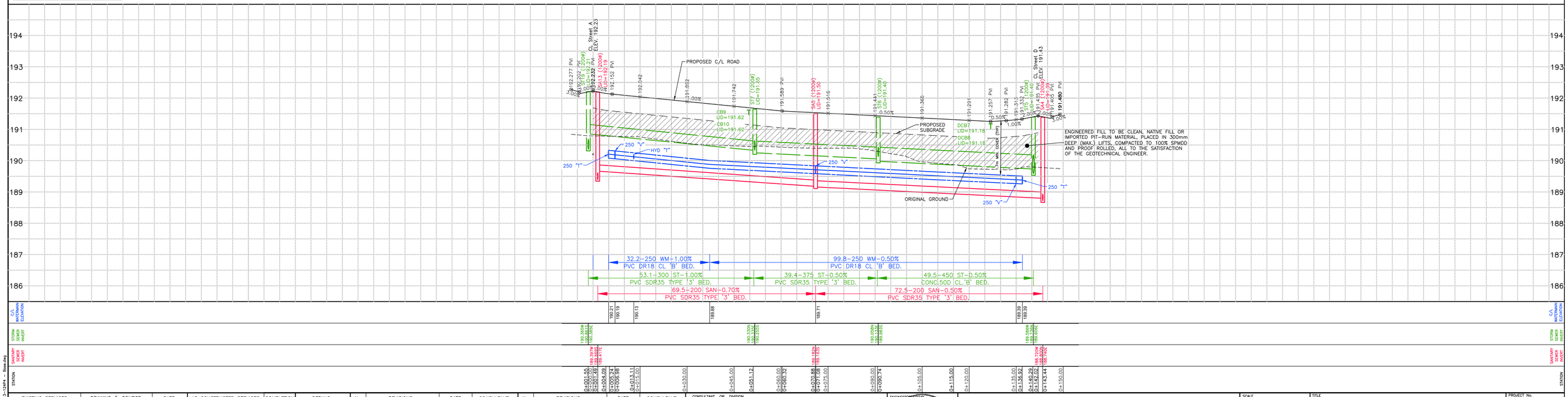

EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION

DETAILS
DESIGN BY SW
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F.BK. ***

No.	REVISIONS	DATE	CONSULTANT
1	1ST ENGINEERING SUBMISSION	SEPT. 05/25	DEVENG

No.	REVISIONS	DATE	CONSULTANT

FILE: DEL13–124P4 – BASE.DWG

CONSULTANT OR DIVISION

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D.J. HOEVENMAARS
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Sept 5, 2025
PROVINCE OF ONTARIO

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5 0 10m
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0.5 0 1m
NTS IF REDUCED FROM 22"X40"

TITLE
DOVER COAST PHASE 4
STREET B
FROM STREET A TO STREET D

PROJECT No. DEL13–124P4
SHEET No. 7
PLAN FILE No.

autocrete Sep 05/25–1:27pm DEL13–124P4 – Base.dwg

LEGEND

- ST1 — PROPOSED STORM MANHOLE
- SA1 — PROPOSED SANITARY MANHOLE
- CBMH1 — PROPOSED CATCHBASIN MANHOLE
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SITE BENCHMARKS:

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ELEVATION = 189.760 METRES

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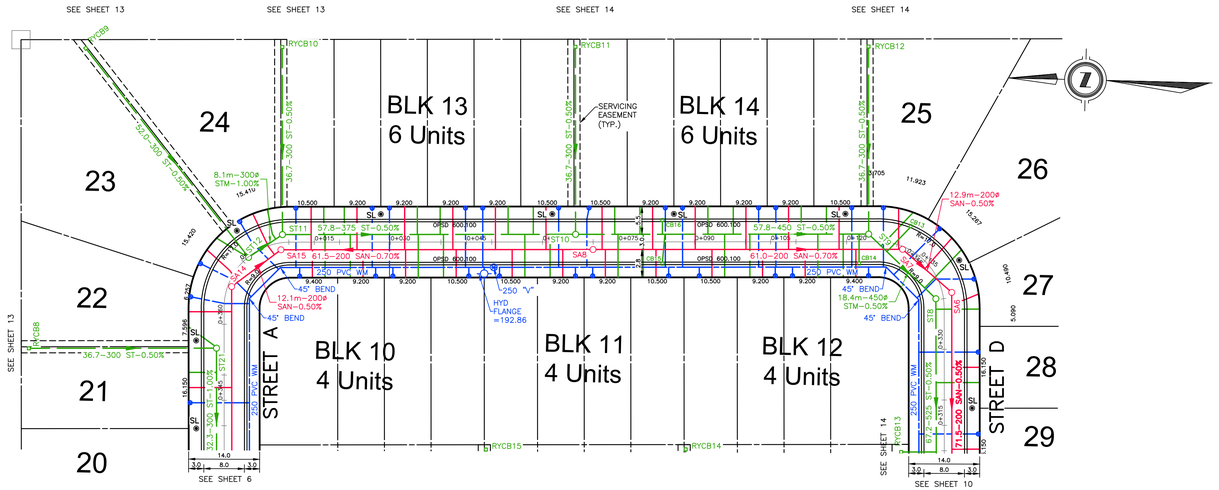
ELEVATION = 191.152 METRES

CURB AND GUTTER OPSD 600.100



REFER TO SHEET 17 FOR STREET TOWN STANDARD SERVICING LOCATIONS DETAIL.

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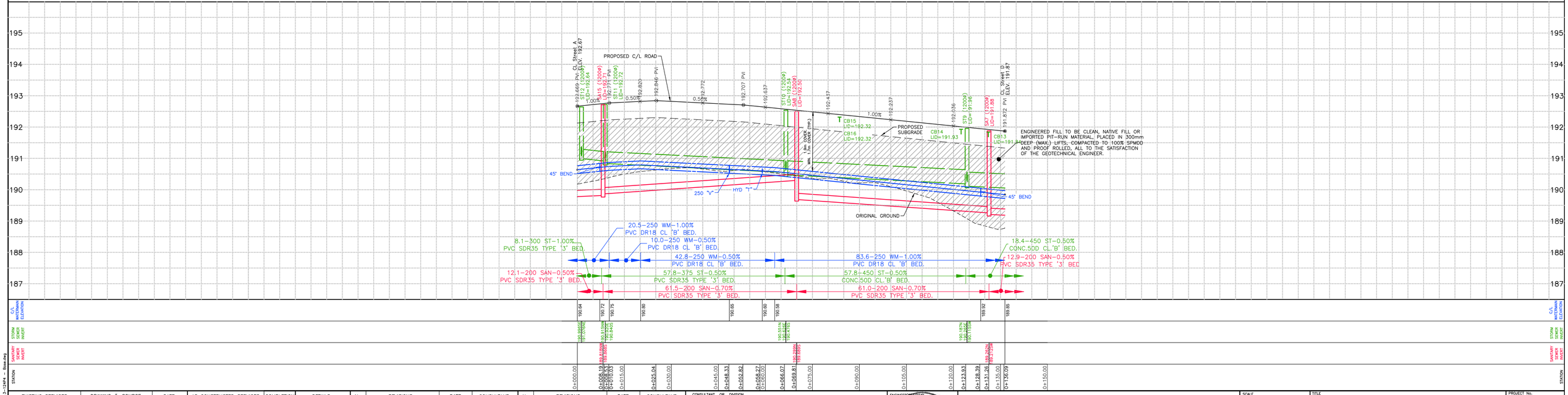
STREET C



EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION

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No.	REVISIONS	DATE	CONSULTANT

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TITLE
DOVER COAST PHASE 4
STREET C
FROM STREET A TO STREET D

PROJECT No. DEL13–124P4
SHEET No. 8
PLAN FILE No.

plotted: Sep 05/25–1:27pm DEL13–124P4 – Base.dwg

LEGEND

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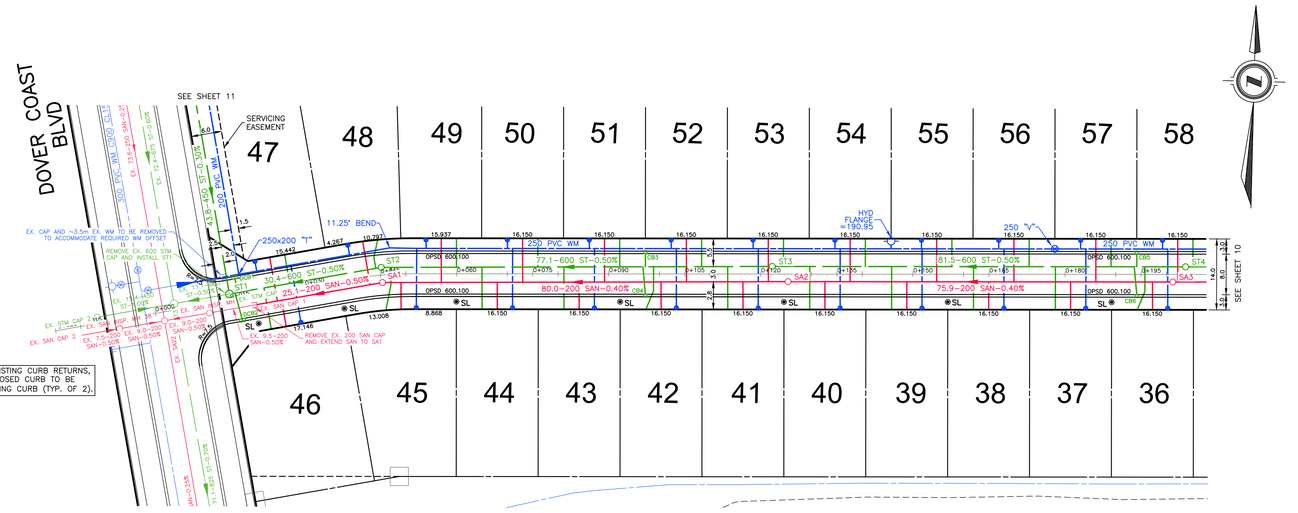
ELEVATION = 191.152 METRES

CURB AND GUTTER OPSD 600.100



REFER TO SHEET 17 FOR STREET TOWN STANDARD SERVICING LOCATIONS DETAIL.

- SANITARY PDC's (MIN. 125mm DIAMETER; SDR 28 PVC) SHALL BE CONSTRUCTED TO MINIMUM 2.25m COVER BELOW FINISHED GRADE AT PROPERTY LINE UNLESS OTHERWISE NOTED.
- STORM PDC's (MIN. 100mm DIAMETER; SDR 28 PVC) SHALL BE CONSTRUCTED TO MINIMUM 1.50m COVER BELOW FINISHED GRADE AT PROPERTY LINE UNLESS OTHERWISE NOTED.
- WATER SERVICES SHALL BE 25.4mm (1") CSA–B137.5 PEX CONSTRUCTED TO MINIMUM 1.70m COVER BELOW FINISHED GRADE AT PROPERTY LINE.

50mm (2") THICK INSULATION OVER WATERMAIN PER MOE DESIGN GUIDELINES FOR DRINKING–WATER SYSTEMS 12.7.2.3 AND NORFOLK WATER INSULATION DETAIL UNTIL 1.2m OF COVER FROM SPRINGLINE IS ACHIEVED. REFERENCE DETAIL ON SHEET 17.

WATER SERVICES CROSSING ABOVE STORM SEWER MUST BE INSULATED PER OPSD 1109.030 WHERE MIN. 1.2m COVER IS NOT ACHIEVED AND/OR 0.5m OR LESS SEPARATION FROM THE INVERT OF THE SEWER OR STRUCTURE IS NOT ACHIEVED

PRIOR TO CONSTRUCTION THE OWNER'S CONTRACTOR SHALL OBTAIN LOCATES FOR, EXPOSE AND CONFIRM LOCATION OF ALL EXISTING UNDERGROUND UTILITIES WITHIN THE LIMIT OF CONSTRUCTION. OWNER'S CONTRACTOR SHALL SUPPORT EXISTING UNDERGROUND UTILITIES AS REQUIRED TO THE SATISFACTION OF THE UTILITY OWNER

ALL SUBGRADE TO BE THOROUGHLY PROOF–ROLLED TO MEET 98% SPMDD AND, WHERE NECESSARY AT THE DISCRETION OF THE ON–SITE GEOTECHNICAL ENGINEER, SUB–EXCAVATED AND REPLACED WITH APPROVED FILL AT THE RECOMMENDATION OF THE ON–SITE GEOTECHNICAL ENGINEER. ALL SUBGRADE MUST BE INSPECTED AND APPROVED BY A GEOTECHNICAL ENGINEER PRIOR TO BACKFILLING.

ROTATE MH CONES TO AVOID CONFLICTS WITH CURBS

CATCHBASINS WITHIN HARD SURFACES REQUIRE SUBDRAINS WHICH SHALL BE 150mmø, MIN. 3.0m LONG, PERFORATED PVC PIPE WITH NON–WOVEN GEOTEXTILE FILTER SOCK (TERRAFIX 200R) AS PER DETAIL ON SHEET 17. PIPE ENDS TO BE CAPPED.

CATCHBASIN NOTES:

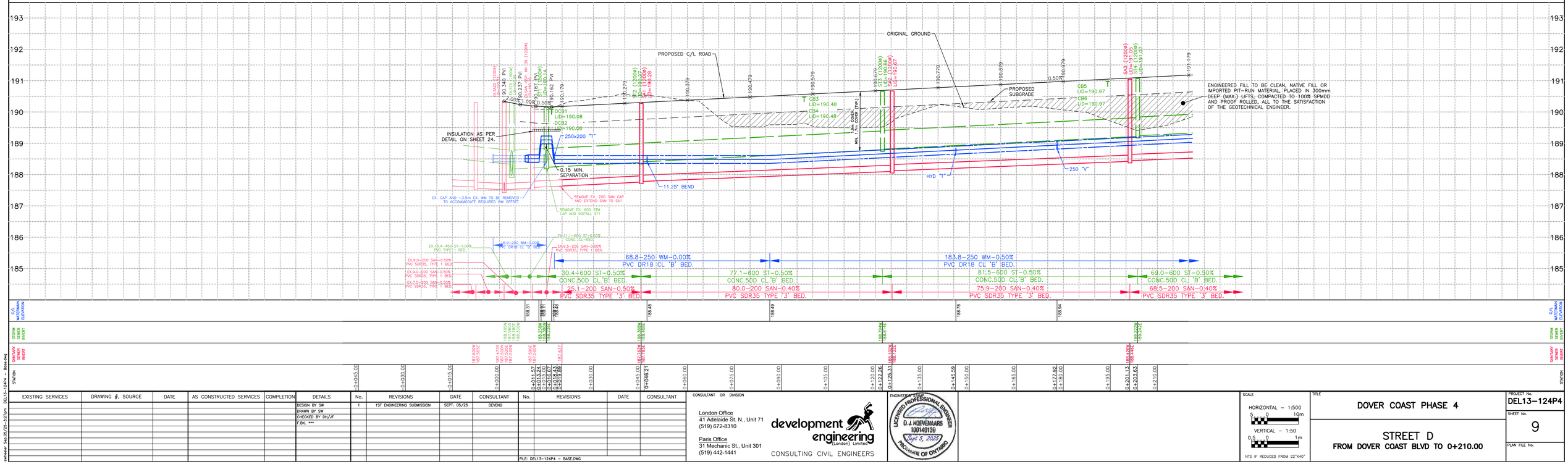
- ALL CATCHBASINS SHALL BE SETBACK. FRONT INSIDE FACE ALIGNED WITH EDGE OF PAVEMENT.
- CURB SETBACKS TO BE CONSTRUCTED PER DETAIL ON SHEET 17.
- LID ELEVATION SET TO FINISHED GRADE.
- 50mm DRAIN TO BE PROVIDED IN BASE ASPHALT.
- CATCHBASIN GRATE SHALL BE OPSD 400.110.
- SINGLE INLET CATCHBASIN CONNECTIONS SHALL BE 250mm.
- TWIN INLET CATCHBASIN CONNECTIONS SHALL BE 300mm.

ALL WATERMAIN CROSSINGS AND VERTICAL OFFSETS ABOVE OR BELOW SEWERS SHALL HAVE A MINIMUM OF 0.5m VERTICAL SEPARATION.

PARSON INSERTS ARE REQUIRED IN ALL MANHOLES UNTIL COMPLETION OF BASE COAT ASPHALT.

OWNER'S CONTRACTOR TO INSTALL CLAY COLLARS ON SANITARY SEWER IN WET CONDITIONS AT THE DIRECTION OF THE GEOTECHNICAL ENGINEER. SEE DETAIL ON SHEET 17.

STREET D



EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION

DETAILS
DESIGN BY SW
DRAWN BY SW
CHECKED BY DH/JF
F.BK. ***

No.	REVISIONS	DATE	CONSULTANT
1	1ST ENGINEERING SUBMISSION	SEPT. 05/25	DEVENG

No.	REVISIONS	DATE	CONSULTANT

FILE: DEL13–124P4 – BASE.DWG

CONSULTANT OR DIVISION

London Office
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ENGINEER'S STAMP
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D.J. HOEVENMARS
100149139
Sept 5, 2025
PROVINCE OF ONTARIO

SCALE
HORIZONTAL – 1:500
5 0 10m
VERTICAL – 1:50
0.5 0 1m
NTS IF REDUCED FROM 22"X40"

TITLE
DOVER COAST PHASE 4
STREET D
FROM DOVER COAST BLVD TO 0+210.00

PROJECT No. DEL13–124P4
SHEET No. 9
PLAN FILE No.

plotted: Sep 05/25–1:27pm DEL13–124P4 – Base.dwg

LEGEND

- ST1 — PROPOSED STORM MANHOLE
- SA1 — PROPOSED SANITARY MANHOLE
- CBMH1 — PROPOSED CATCHBASIN MANHOLE
- CB1 — PROPOSED STANDARD CATCHBASIN
- TICB1 — PROPOSED TWIN INLET CATCHBASIN
- 50.0–200 SAN–1.0% — PROPOSED SANITARY SEWER
- 50.0–600 ST–0.5% — PROPOSED STORM SEWER
- 200ø PVC WM — PROPOSED WATERMAIN
- W.V. — PROPOSED WATER VALVE
- HYD — PROPOSED HYDRANT TEE, 150 GATE VALVE & 3–WAY HYDRANT WITH STORZ CONNECTION
- ® — PROPOSED SIDEWALK RAMP LOCATION c/w TACTILE PLATES (PER SECTION 3.4 – NORFOLK COUNTY ACCESSIBILITY DESIGN GUIDELINES)
- SL — PROPOSED STREET LIGHT LOCATION
- CMB — PROPOSED LOCATION FOR COMMUNITY MAILBOX
- PROPOSED TRANSFORMER AND CONCRETE PAD

SITE BENCHMARKS:

BM1 – CUT CROSS SET IN TOP WEST CURB OF DOVER COAST BLVD AT 1ST HYDRANT #361 NORTH OF NEW LAKESHORE RD
ELEVATION = 189.760 METRES

BM2 – CUT CROSS SET IN TOP NW CORNER OF CONCRETE PAD FOR TRANSFORMER #60140 LOCATED ON THE EAST SIDE OF DOVER COAST BLVD, NW OF THE NW CORNER OF THE POND SOUTH OF PHASE 4
ELEVATION = 190.266 METRES

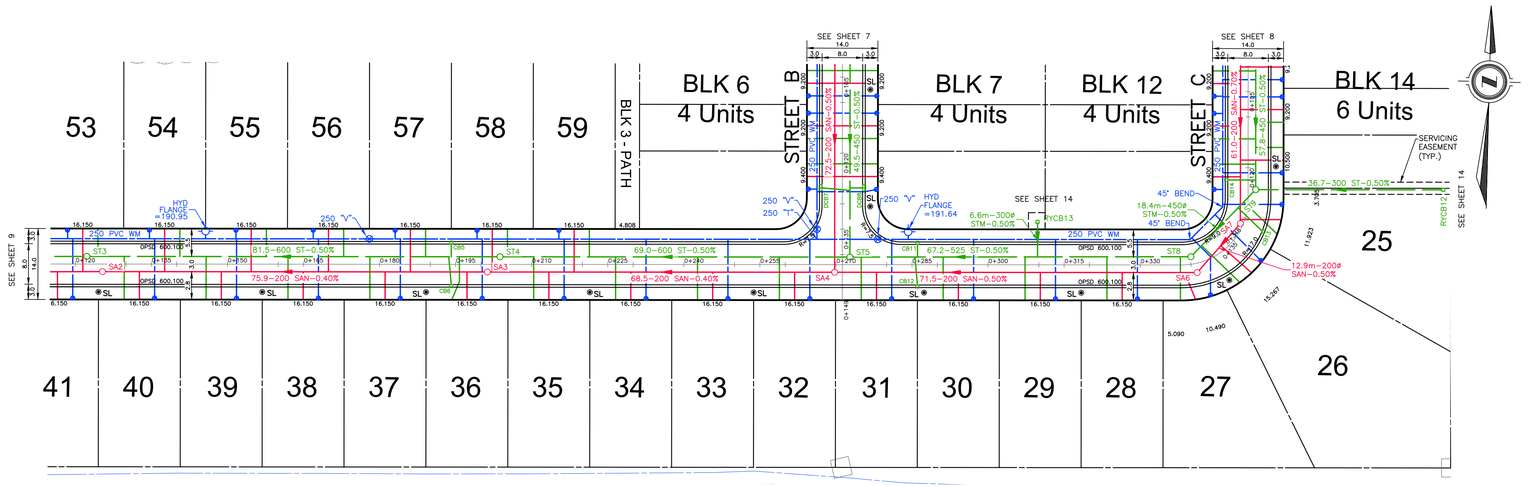
BM3 – TOP SPINDLE OF HYDRANT #368 LOCATED ON THE WEST SIDE OF DOVER COAST BLVD, 2ND HYDRANT NORTH OF NEW LAKESHORE RD.
ELEVATION = 191.396 METRES

BM4 – CUT CROSS SET TOP WEST CURB OF DOVER COAST BLVD AT HYDRANT #368, 2ND HYDRANT NORTH OF NEW LAKESHORE BLVD
ELEVATION = 190.413 METRES

BM5 – CUT CROSS SET IN TOP EAST CURB OF DOVER COAST BLVD AT 1ST CATCH BASIN NORTH OF SOUTH FUTURE EAST–WEST ROAD INTO PHASE 4
ELEVATION = 190.640 METRES

BM6 – CUT CROSS SET IN WEST CURB OF DOVER COAST BLVD AT HYDRANT #369, 3RD NORTH OF NEW LAKESHORE BLVD
ELEVATION = 191.152 METRES

CURB AND GUTTER OPSD 600.100



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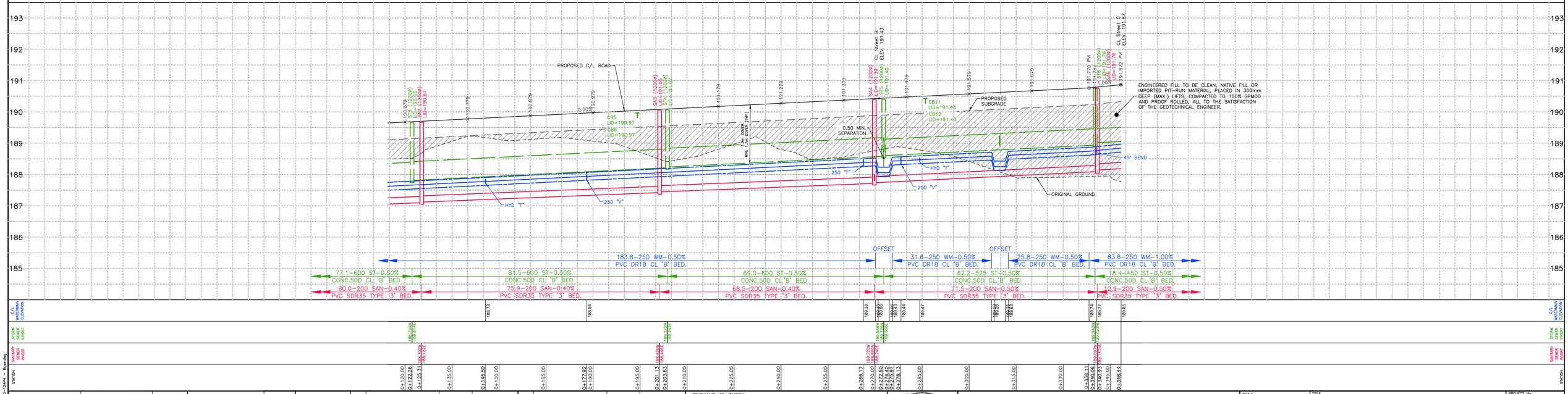
STREET D



EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION

DETAILS	
DESIGN BY SW	
DRAWN BY SW	
CHECKED BY DH/JF	
F.BK. ***	

No.	REVISIONS	DATE	CONSULTANT
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5 0 10m
VERTICAL – 1:50
0.5 0 1m
NTS IF REDUCED FROM 22"X40"

TITLE
DOVER COAST PHASE 4
STREET D
FROM 0+115.00 TO STREET C

PROJECT No. DEL13–124P4
SHEET No. 10
PLAN FILE No.

plotted: Sep 05/25–1:27pm DEL13–124P4 – Base.dwg

LEGEND

ST1	PROPOSED STORM MANHOLE
CBMH1	PROPOSED CATCHBASIN MANHOLE
CB1	PROPOSED STANDARD CATCHBASIN
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50.0–600 ST–0.5%	PROPOSED STORM SEWER

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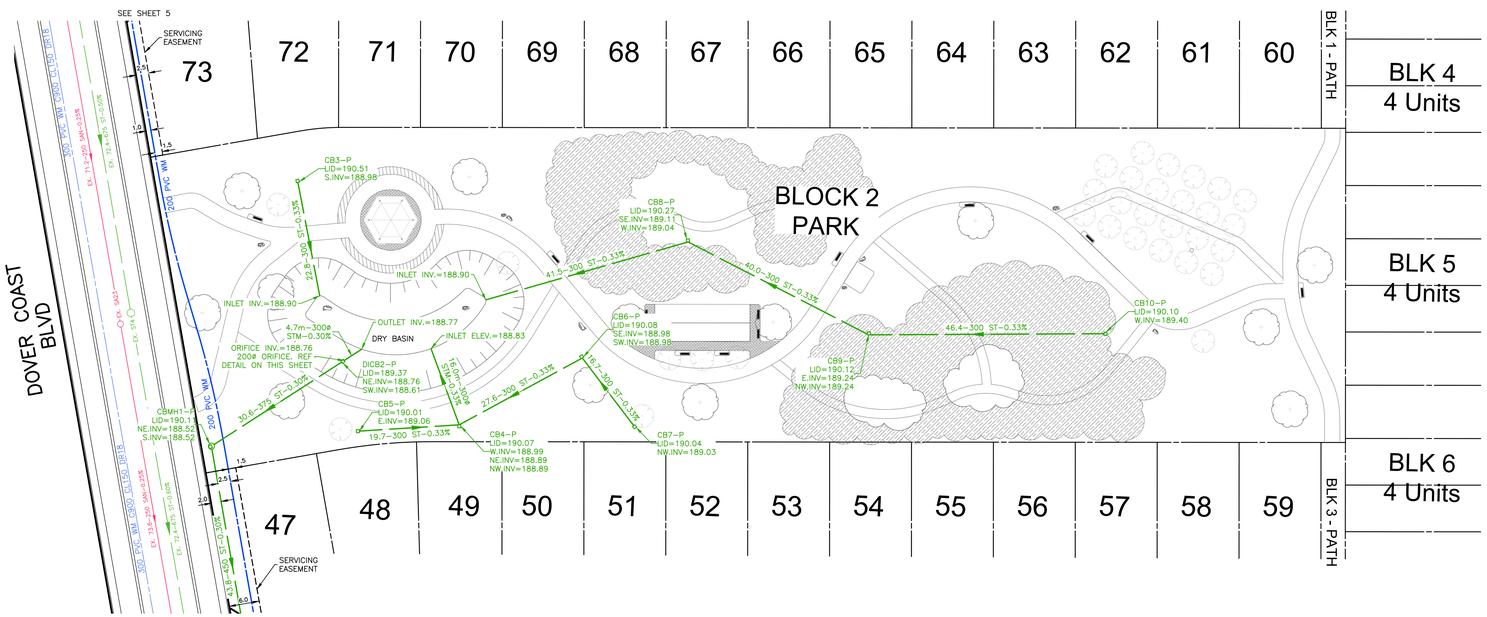

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DRY BASIN PONDING LEVELS/VOLUMES

REGIONAL EVENT ELEV.=189.79m/345m3

100–YEAR ELEV.=189.49m/215m3

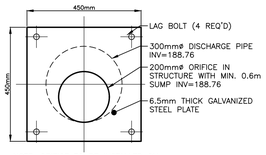
50–YEAR ELEV.=189.47m/202m3

25–YEAR ELEV.=189.44m/188m3

10–YEAR ELEV.=189.35m/150m3

5–YEAR ELEV.=189.22m/100m3

2–YEAR ELEV.=189.11m3/63m3



NOTE: ORIFICE TO BE INSTALLED ON UPSTREAM INVERT OF DICB2–P

DICB2–P ORIFICE PLATE
1:10

EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION

DETAILS	
DESIGN BY	SW
DRAWN BY	SW
CHECKED BY	DH/JF
F.BK.	***

No.	REVISIONS	DATE	CONSULTANT
1	1ST ENGINEERING SUBMISSION	SEPT. 05/25	DEVENG

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FILE: DEL13–124P4 – BASE.DWG

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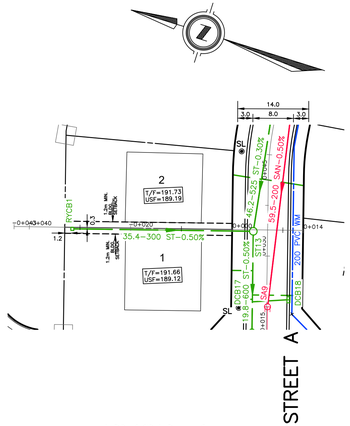
100149139
Sept 5, 2025
PROVINCE OF ONTARIO

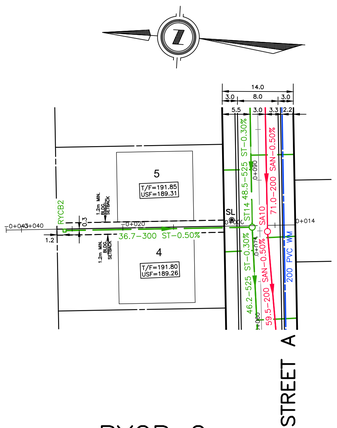
SCALE
SCALE – 1:500
5 0 10m
NTS IF REDUCED FROM 22"X40"

TITLE
DOVER COAST PHASE 4
PARK SERVICING

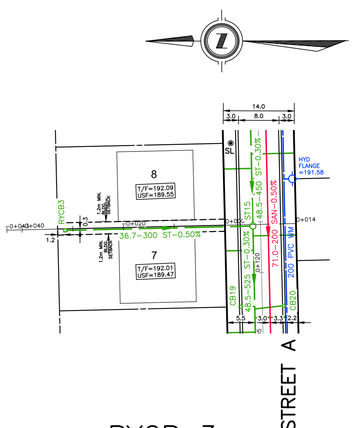
PROJECT No. DEL13–124P4
SHEET No. 11
PLAN FILE No.



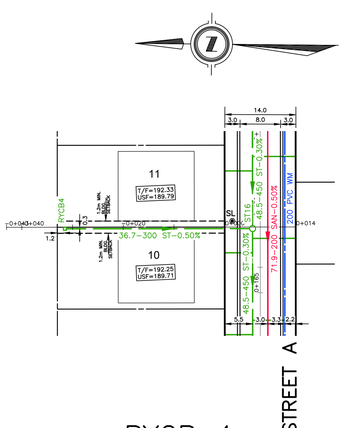
RYCB 1



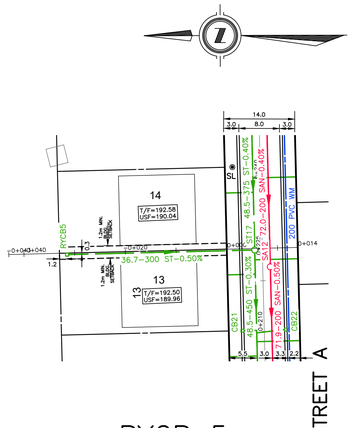
RYCB 2



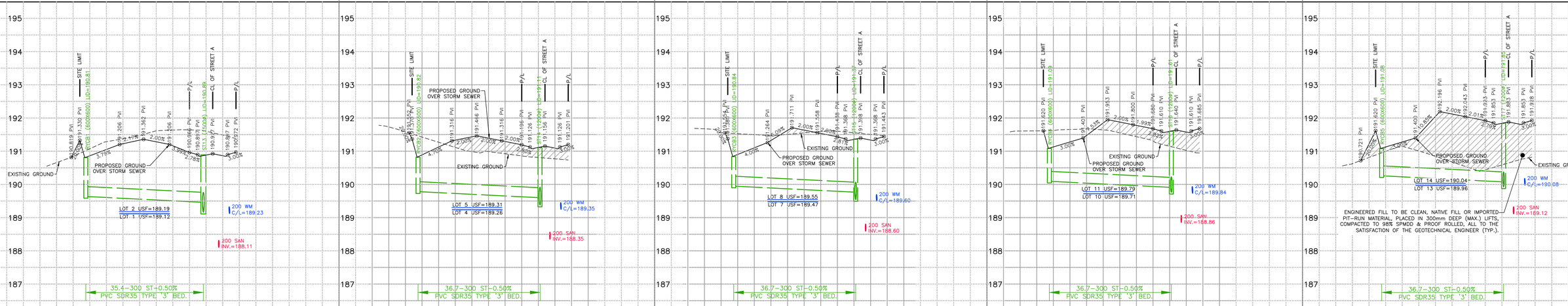
RYCB 3



RYCB 4



RYCB 5



C/L WATERMAIN ELEVATION

STORM SEWER INVERT

SANITARY SEWER INVERT

STATION

EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION

DETAILS
DESIGN BY SW
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5 0 10m
VERTICAL - 1:50
0.5 0 1m
NTS IF REDUCED FROM 22"X40"

TITLE
DOVER COAST PHASE 4
RYCB 1 - LOT 1/2
RYCB 2 - LOT 4/5
RYCB 3 - LOT 7/8
RYCB 4 - LOT 10/11
RYCB 5 - LOT 13/14

PROJECT No. DEL13-124P4
SHEET No. 12
PLAN FILE No.

plotted: Sep 05/25--1:27pm DEL13-124P4 - RYCB.dwg


RYCB 6
STREET B
STREET A
36.7–300 ST–0.50%
T/F=192.82
USF=190.28
T/F=192.74
USF=190.20
RYCB 7
36.7–300 ST–0.50%
T/F=193.06
USF=190.52
T/F=192.98
USF=190.44
RYCB 8
STREET C
36.7–300 ST–0.50%
T/F=193.22
USF=190.68
T/F=193.14
USF=190.60
RYCB 9
52.0–300 ST–0.50%
8.1m–300ø STM–1.00%
T/F=193.35
USF=190.81
T/F=193.41
USF=190.87
BLOCK 13
RYCB 10
36.7–300 ST–0.50%
PROPOSED GROUND OVER STORM SEWER
EXISTING GROUND
LOT 17 USF=190.28
LOT 16 USF=190.20
200 WM C/L=190.32
200 SAN INV.=189.31
LOT 20 USF=190.52
LOT 19 USF=190.44
250 WM C/L=190.57
200 SAN INV.=189.52
LOT 22 USF=190.68
LOT 21 USF=190.60
250 WM C/L=190.73
LOT 24 USF=190.87
LOT 23 USF=190.81
250 WM C/L=190.88
200 SAN INV.=189.78
BLOCK 13 USF=190.98
LOT 24 USF=190.87
250 WM C/L=190.95
ENGINEERED FILL TO BE CLEAN, NATIVE FILL OR IMPORTED PIT–RUN MATERIAL, PLACED IN 300mm DEEP (MAX.) LIFTS, COMPACTED TO 98% SPMDD & PROOF ROLLED, ALL TO THE SATISFACTION OF THE GEOTECHNICAL ENGINEER (TYP.).
36.7–300 ST–0.50%
PVC SDR35 TYPE '3' BED.
52.0–300 ST–0.50%
PVC SDR35 TYPE '3' BED.
C/L WATERMAIN ELEVATION
STORM SEWER INVERT
SANITARY SEWER INVERT
STATION

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CONSULTING CIVIL ENGINEERS

ENGINEER'S STAMP
LICENSED PROFESSIONAL ENGINEER
D. J. HOEVENAARS
100149139
Sept 5, 2025
PROVINCE OF ONTARIO

SCALE
HORIZONTAL – 1:500
VERTICAL – 1:50
NTS IF REDUCED FROM 22"X40"

TITLE
DOVER COAST PHASE 4

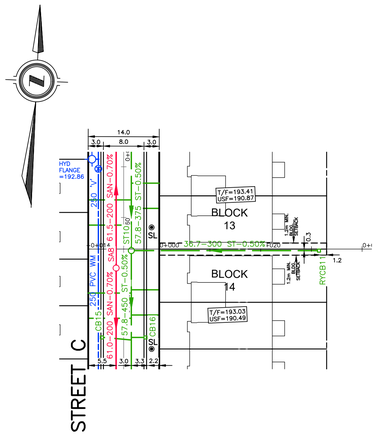
RYCB 6 – LOT 16/17
RYCB 7 – LOT 19/20
RYCB 8 – LOT 21/22
RYCB 9 – LOT 23/24
RYCB 10 – LOT 24/BLOCK 13

PROJECT No. DEL13–124P4

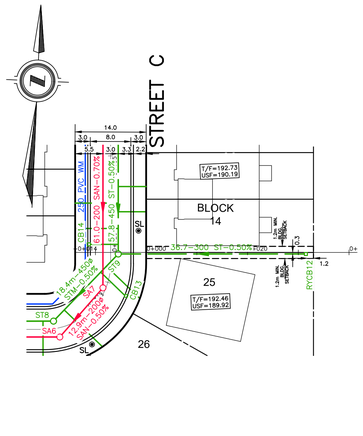
SHEET No. 13

PLAN FILE No.

swheeler Sep.05/25–3:27pm DEL13–124P4 – RYCB.dwg



RYCB 11



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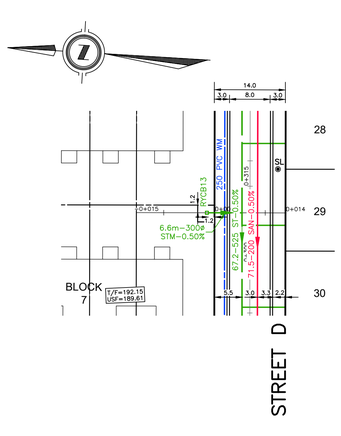

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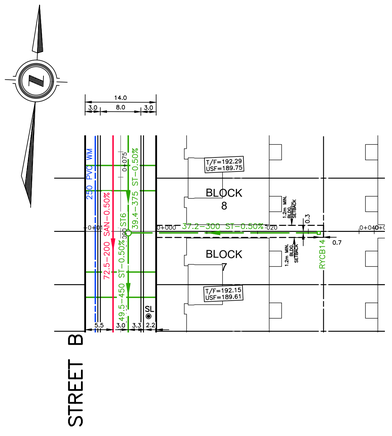
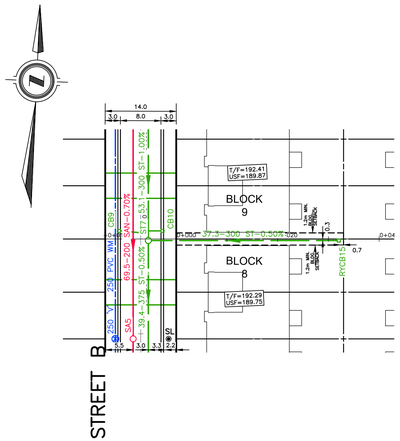
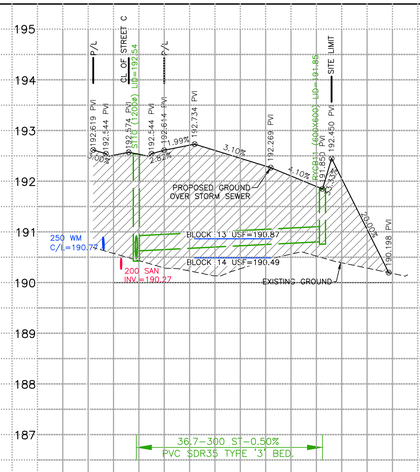
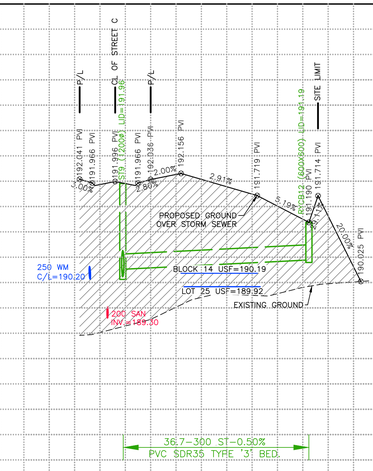


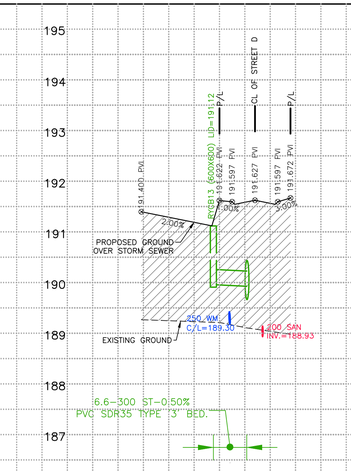
RYCB 14

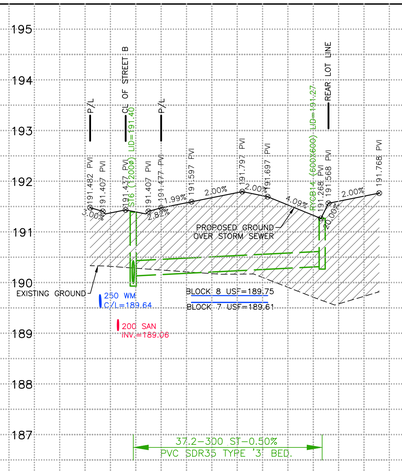


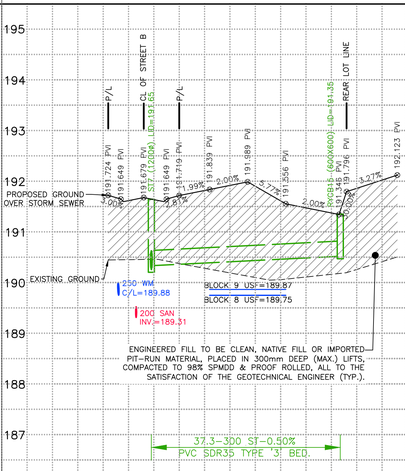
RYCB 15











C/L INTERSECTION ELEVATION

STORM SEWER INVERT

SANITARY SEWER INVERT

STATION 0+015.00 0+000.00 0+015.00 0+030.00 0+045.00

EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION

DETAILS
DESIGN BY SW
DRAWN BY SW
CHECKED BY DH/JF
F.BK. ***

No.	REVISIONS	DATE	CONSULTANT
1	1ST ENGINEERING SUBMISSION	SEPT. 05/25	DEVENG

No.	REVISIONS	DATE	CONSULTANT

FILE: DEL13-124P4 - RYCB.DWG

CONSULTANT OR DIVISION

London Office
41 Adelaide St. N., Unit 71
(519) 672-8310

Paris Office
31 Mechanic St., Unit 301
(519) 442-1441

development engineering (london) limited
CONSULTING CIVIL ENGINEERS

ENGINEER'S STAMP: LICENSED PROFESSIONAL ENGINEER, D.J. HOEVENAARS, 100149139, Sept 5, 2025, PROVINCE OF ONTARIO

SCALE
HORIZONTAL - 1:500
5 0 10m
VERTICAL - 1:50
0.5 0 1m
NTS IF REDUCED FROM 22"X40"

TITLE
DOVER COAST PHASE 4
RYCB 11 - BLOCK 13/14
RYCB 12 - BLOCK 14/LOT 25
RYCB 13 - BLOCK 7
RYCB 14 - BLOCK 7/8
RYCB 15 - BLOCK 8/9

PROJECT No. DEL13-124P4
SHEET No. 14
PLAN FILE No.

plotted: Sep 05/25--1:28pm DEL13-124P4 - RYCB.dwg

STREET A
STREET B
STREET C
STREET D
DOVER COAST BLVD
BLOCK 4
BLOCK 5
BLOCK 6
BLOCK 7
BLOCK 8
BLOCK 9
BLOCK 10
BLOCK 11
BLOCK 12
BLOCK 13
BLOCK 14
150ø SUBDRAIN UNDER BOTTOM OF SWALE. REF. DETAIL ON SHEET 17.
LIGHT DUTY SILT FENCE AS PER DETAIL ON SHEET 17.
2.4m SERVICING EASEMENT (TYP.)
REF. LANDSCAPE PLAN SHEET L1.1 BY BALLANTRY HOMES FOR ADDITIONAL PARK DESIGN INFORMATION.
150ø SUBDRAIN UNDER BOTTOM OF SWALE. REF. DETAIL ON SHEET 24.
5:1 SLOPE
TOP OF POND = 190.59
PROPOSED CURB TO BE TRANSITIONED INTO EXISTING CURB (TYP. OF 2)
SILT FENCE TO BE TRANSITIONED FROM LIGHT DUTY TO HEAVY DUTY
HEAVY DUTY SILT FENCE AS PER DETAIL ON SHEET 17.
EXISTING SWMF/IRRIGATION POND
EDGE OF POND
300 PVC WM C900 CL150 DR18
EXISTING GOLF COURSE DRAIN LID ELEV=189.87

GOLF COURSE SWALES ARE TO BE ESTABLISHED TO MAINTAIN EXISTING DRAINAGE PATTERNS. MIN. 2% SWALES ARE TO BE DIRECTED TO EXISTING GOLF COURSE DRAINS

LEGEND

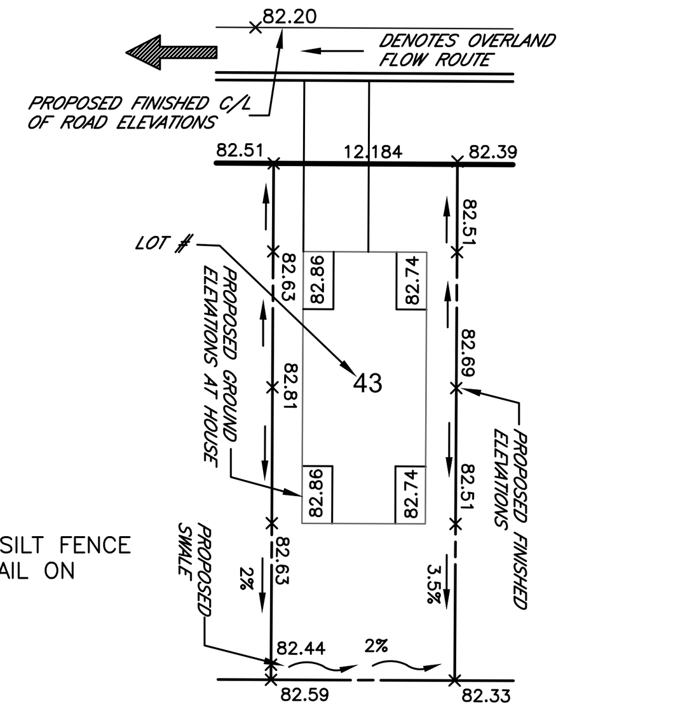
- WV — PROPOSED WATER VALVE
- HYD — PROPOSED FIRE HYDRANT
- CB — PROPOSED CATCHBASIN (OPSD 705.010)
- CICB — CURB INLET CATCH BASIN (OPSD 400.090)
- TICB — TWIN INLET CATCHBASIN (OPSD 705.020) (LID ELEVATION NOTED FOR ROAD INLETS REPRESENTS EP GRADE)
- CBMH — PROPOSED CATCHBASIN MANHOLE
- CBMH — CATCHBASIN MANHOLE WITH STRAWBALE FILTER
- ST1 — STORM MAINTENANCE HOLE
- SA1 — PROPOSED SANITARY MAINTENANCE HOLE
- EX. WV — EXISTING WATER VALVE
- EX. FH — EXISTING FIRE HYDRANT
- EX. CB — EXISTING CATCHBASIN
- EX. CBMH — EXISTING CATCHBASIN MAINTENANCE HOLE
- EX. STMH — EXISTING STORM MAINTENANCE HOLE
- Ⓡ — PROPOSED SIDEWALK RAMP LOCATION
- 78.65 — PROPOSED GRADE
- ±78.65 — EXISTING GRADE TO BE MATCHED
- 84.94 — PROFILE GRADE CHANGE
- 150mm PERFORATED SUBDRAIN
- LIGHT DUTY SILT FENCE AS PER DETAIL ON SHEET 17
- HEAVY DUTY SILT FENCE AS PER DETAIL ON SHEET 17
- L/O USF= — LOOKOUT LOT USF SPECIFIED TO ENSURE FROST PROTECTION AT REAR
- W/O USF= — WALKOUT LOT USF SPECIFIED TO ENSURE FROST PROTECTION AT REAR
- OVERLAND FLOW DIRECTION
- EF — LOTS REQUIRING ENGINEERED FILL (FILL TO 1.0m ABOVE USF)
- UNITS WHERE FOOTINGS SHALL BE DEEPENED ADJACENT TO REAR YARD STORM DRAIN
- SL — PROPOSED STREETLIGHT
- SL.PED — PROPOSED STREET LIGHTING POWER PEDESTAL
- PROPOSED HYDRO TRANSFORMER
- BELL — PROPOSED BELL PEDESTAL/GRADE BOX
- ROGERS — PROPOSED ROGERS PEDESTAL/GRADE BOX
- DENOTES MAX. PONDING LIMITS BY GRADING

NOTES

1) SEE SHEET BENCHMARKS ON SHEET 16. TWO BENCHMARKS SHALL BE USED AT ALL TIMES.
2) FOR BOREHOLE INFORMATION REF. GEOTECH REPORT BY SOIL ENGINEERING LTD DATED MARCH 2006. REPORT NO. 0511–S117

LOT GRADING NOTES

1. UNLESS SPECIFIED OTHERWISE TOPSOIL DEPTH (RESPREAD) SHALL BE 300mm.
2. NO TREES ARE TO BE UNNECESSARILY REMOVED.
3. FOR GENERAL NOTES AND DETAILS, SEE SHEETS 16 & 17.
4. BUILDERS SITE GRADING PLANS FOR INDIVIDUAL LOTS MUST BE SUBMITTED TO THE ENGINEER & APPROVED PRIOR TO COMMENCING HOUSE CONSTRUCTION.
5. EXISTING DRAINAGE OR ABUTTING LANDS IS NOT TO BE DISTURBED.
6. BASEMENT OPENINGS TO BE AT LEAST 300mm ABOVE CENTRELINE OF ROAD, UNLESS APPROVED OTHERWISE BY THE CITY ENGINEER.
7. AT LEAST TWO BENCHMARKS ARE TO BE USED AT ALL TIMES DURING CONSTRUCTION. SEE SHEET 16 FOR BENCHMARKS USED.
8. SUMP PUMP DISCHARGE MUST BE DIRECTED TO STORM SEWER VIA STORM PDC.
9. RETAINING WALLS, 1.0m HIGH OR GREATER, ARE TO BE DESIGNED BY AND CONSTRUCTED TO THE SPECIFICATIONS OF A REGISTERED PROFESSIONAL ENGINEER IN ACCORDANCE WITH THE ONTARIO BUILDING CODE.
10. LOCALIZED SURFACE DRAINAGE FROM ABUTTING LOTS TO BE DEVELOPED IN THE FUTURE MAY DISCHARGE ONTO THE PROPOSED LOTS IN THIS SUBDIVISION.



LO – DENOTES LOOK OUT LOT
WO – DENOTES WALK OUT LOT

GOLF COURSE SWALES ARE TO BE ESTABLISHED TO MAINTAIN EXISTING DRAINAGE PATTERNS. MIN. 2% SWALES ARE TO BE DIRECTED TO EXISTING GOLF COURSE DRAINS

I HEREBY CERTIFY THAT THE PROPOSED GRADING AND APPURTENANT DRAINAGE WORKS COMPLY WITH SOUND ENGINEERING DESIGN AND THAT THE PROPOSED GRADING IS COMPATIBLE WITH APPLICABLE MUNICIPAL BYLAWS AND THE EXISTING DRAINAGE PATTERNS ON AND ACROSS THESE LANDS.

EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION	DETAILS	No.	REVISIONS	DATE	CONSULTANT	No.	REVISIONS	DATE	CONSULTANT
					DESIGN BY SW		1ST ENGINEERING SUBMISSION	SEPT. 05/25					
					DRAWN BY SW								
					CHECKED BY DH/JF								
					F.BK. ***								

FILE: DEL13–124P4 – GRADING.DWG

CONSULTANT OR DIVISION

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development engineering (London) Limited
CONSULTING CIVIL ENGINEERS

ENGINEER'S STAMP
LICENSED PROFESSIONAL ENGINEER
D. J. HOEVENAARS
100149139
Sept 5, 2025
PROVINCE OF ONTARIO

SCALE
SCALE – 1:500
5 0 10m
NTS IF REDUCED FROM 22"X40"

TITLE
DOVER COAST – PHASE 4
PORT DOVER, ONTARIO

GRADING PLAN

PROJECT No.
DEL13–124P4

SHEET No.
15

PLAN FILE No.

swheeler Sep.05/25–3:28pm DEL13–124P4 – Grading.dwg

GENERAL CONSTRUCTION NOTES

1. All existing underground utilities, either shown or not shown, are to be located and marked prior to commencing construction within the site and on existing abutting road allowance. Any utilities damaged or disturbed during construction shall be repaired or replaced to the satisfaction of the governing body at the sole expense of the Owner's Contractor.
2. The Owner's Contractor is to meet all the requirements of the owners of the utilities on this plan, and must make satisfactory arrangements with the utility companies for crossing their installations and for providing adequate protection during construction. All existing underground plant (ie. telephone duct, gas mains, sewer, watermains) that will be crossed under during the installation of services for this development shall be supported by a support beam or by other methods as may be required by the Owners of the plant being crossed under. All temporary support measures required during the construction phase shall be the responsibility of the Owner's Contractor and independent engineering review/certifications shall be undertaken where necessary at no extra cost to the contract.
3. All existing boulevards and road surfaces disturbed during construction shall be restored to a condition at least as good as original (pre-construction condition), all to the satisfaction of Norfolk County.
4. Prior to commencing ANY construction, the Owner's Contractor must verify all outlet information, benchmarks, elevations and dimensions and report any discrepancies immediately to the Engineer.
5. Prior to commencing any work on the installation of services, an approved set of plans must be available on the job site and shall remain there until work is completed.
6. The Owner's Contractor is responsible for the control of surface and subsurface water.
7. The Developer shall have its Professional Engineer provide adequate inspection during construction on the site and a Certificate of Completion of works upon completion of all works which are to be assumed by the owner.
8. The Owner's Contractor shall take all necessary precautions to prevent the spilling or dumping of hazardous materials while fueling and maintaining vehicles and equipment.
9. If in the opinion of the Engineer a zone is contaminated through neglect and/or deliberate mishandling of toxic materials by the Owner's Contractor, the Owner's Contractor shall at no expense to the Owner excavate and dispose of all contaminated materials to an approved disposal site and provide soil remediation.
10. At least 48 hours prior to commencing construction on any existing road allowance maintained by Norfolk County, the Owner's Contractor is to obtain the appropriate work approval permit from the Norfolk County Engineering Department.
11. The Owner's Contractor is responsible for notifying Norfolk County for all building inspection requirements and keep them informed as to their schedule.
12. Existing servicing and topographic information was obtained by Development Engineering (London) Limited, dated May 30th, 2025.
13. Existing legal (boundary) information was obtained by KRCMAR, dated October 6, 2008.
14. For geotechnical information and recommendations respecting construction, refer to geotechnical report prepared by Soil Engineers LTD, dated March 2006, Report No. 0511-S117.

CONSTRUCTION NOTES FOR THE SERVICING CONTRACTOR

1. The Contractor shall take precautions to avoid damage to existing servicing and surfaces not designated for removal. Any damage shall be repaired and restoration completed at the expense of the Owner's Contractor.
2. Prior to initiating site works, the Owner's Contractor shall obtain locates for all existing underground utilities within the area of construction. The Owner's Contractor shall be responsible for the cost of repair or replacement of any utilities damaged or disturbed during construction, and shall immediately contact the appropriate utility owner upon such occurrence.
3. Where utility crossings are required, the Owner's Contractor shall undertake appropriate measures for the temporary support of such utilities in accordance with the requirements of the utility owner until such time as backfilling and compaction are complete.
4. Prior to construction, an approved set of plans and specifications shall be available on the job site and shall remain on-site for the duration of construction. The Owner's Contractor shall verify with the Contract Administrator that the most current drawings are in circulation.
5. The Owner's Contractor shall be responsible for protection of all survey markers and monuments during construction. Any legal survey monuments which are disturbed during construction shall be replaced at the expense of the Owner's Contractor.
6. All works shall be undertaken in accordance with current Occupational Health and Safety Act requirements.
7. Prior to undertaking on-site earth works, the Owner's Contractor shall install all sediment controls relevant to the area of site disturbance.
8. The Owner's Contractor shall be responsible for regular monitoring and cleanup of tracked mud/debris on adjacent lands and public roads to the satisfaction of the County of Norfolk.
9. The Owner's Contractor shall take all reasonable measures to avoid mixing topsoil with subsoil where required for reuse on-site.
10. On-site surface drainage shall be maintained by the Owner's Contractor at all times. Erosion and sediment controls shall be applied where necessary to prevent uncontrolled release of sediment off-site. Where excavation dewatering is necessary, pump discharge shall be directed to stable, vegetated areas or dedicated sediment traps (OPSD 219.214) to the satisfaction of the Engineer.
11. The Owner's Contractor shall maintain an operations log of erosion & sediment control structure inspections throughout the project, with particular emphasis on control measures after rainfall events of 12mm or greater. Periodic removal of accumulated sediment shall be undertaken as necessary or at the expressed direction of the Engineer. All collected sediment shall be disposed of at an approved location at no extra cost to the contract.
12. Topsoil windrows shall be constructed separately from subsoil stockpiles, and shall be located no closer than two (2) metres from any adjacent property boundary. Windrow Slopes shall generally be flatter than 3:1 (horizontal to vertical) and should generally not exceed 6 metres in height.
13. Temporary interceptor swales to be 600mm wide (min.) with 3:1 side slopes, and maintained until site pregrade is stabilized with temporary vegetation to the satisfaction of the engineer.
14. Sediment controls shall be implemented by the Owner's Contractor in localized areas, as warranted, during construction phases, upon the direction of the engineer. Control approaches should be adaptable to reflect variable site conditions and circumstances.
15. The Owner's Contractor shall prevent wind blown dust by periodic application of water and/or calcium chloride.
16. All substitutions are subject to approval by the Engineer.

EARTHWORKS NOTES AND GEOTECHNICAL CONSIDERATIONS

1. For geotechnical information and recommendations respecting construction, refer to geotechnical report prepared by Soil Engineers LTD, dated March 2006, Report No. 0511-S117.
2. Subgrade preparation: Prior to placing the granular subbase or trench bedding material, existing topsoil and unsuitable fill material shall be removed from the building envelope, servicing corridors and pavement areas. It is recommended that the subgrade be proof-rolled with a heavy roller to compress the loose surface material. The need for localized subgrade improvement will be assessed by the on-site Geotechnical Engineer based upon encountered conditions. The native sand and silty subsoils may be considered suitable for reuse as backfill material subject to appropriate moisture conditioning. Any soil proposed for reuse should be within 3% of the optimum moisture and subject to approval by the Geotechnical Engineer. The backfill material should not be placed in lifts exceeding 300mm. Subgrade fill material (if required) between competent native subgrade and granular base shall be imported granular or select/approved inorganic native material (except wet sandy silt) compacted to 95% SPMDD with acceptable moisture content control to the satisfaction of the Geotechnical Engineer.
3. The Owner's Contractor shall be responsible for the excavation of unsuitable fill material above pregrade elevation from within the work zone and the disposal of all such excess material at no extra cost to the contract. A licensed hauler may be required to transport subsoil fill and construction debris from the site to an approved facility in accordance with O.Reg. 511. Testing may be undertaken by the Owner, but all costs associated with offsite disposal shall be borne by the Owner's Contractor.
4. Excavation of subsoil and fill material shall be undertaken by the Owner's Contractor to remove cobbles where necessary prior to onsite reuse.
5. Excavation into select areas may encounter Type 3 and 4 soils, as classed by the Occupational Health and Safety Act. The Owner's Contractor shall be responsible to manage and control all water (subsurface and surface) during the contract duration, and the measures used to enact such control, including all required permits/approvals (ie. PTTW or EASR) based upon selected control methods, at no extra cost to the contract.
6. The subexcavation of select areas may warrant special temporary support measures by the Owner's Contractor, including but not limited to temporary shoring, retaining walls, piles, structural beams or underpinning, and all such measures shall be appropriately designed by qualified professionals and implemented as necessary for the timely completion of works so as to maintain project schedule, at no extra cost to the contract. Shop drawings prepared and certified by qualified professionals shall be submitted for review and acceptance by the Engineer. All such structures shall be designed with consideration for drainage of backfill without risk of piping failure. Reference shall be drawn to the geotechnical recommendations by Soil Engineers LTD.
7. Where control of groundwater may warrant the need to pump in excess of 50,000 Litres per day based upon selected control methods, the Owner's Contractor shall, at no extra cost to the contract, engage qualified professionals and Subcontractors as necessary to obtain a Permit to Take Water (PTTW) or Environmental Activity and Sector Registry (EASR), where dewatering is less than 400,000 Litres per day under normal conditions from MECP pursuant to sections 34 and 98 of the Ontario Water Resources Act further to full scale pump tests. Construction sequencing and methods will be expected to be undertaken in accordance with the Owner's Contractor's Water Control Plan.
8. Suitability of soil for reuse of select clean fill and native subsoil for compaction shall remain subject to the approval of the Geotechnical Engineer. As noted by the geotechnical investigation, blending and moisture conditioning may be warranted to prepare soils to within 3% of optimum moisture content to the satisfaction of the Geotechnical Engineer.
9. Where encountered groundwater conditions warrant, select sewer trenches shall be constructed with anti-seepage collars of select suitable subsoil or lean concrete fill to the satisfaction of the Geotechnical Engineer, at no extra cost to the contract.
10. Any structural/engineered fill placement shall be constructed by the Owner's Contractor under the full time supervision of the Geotechnical Engineer.
11. Foundation Backfill and application of impermeable soil seals prior to final grading around the building envelope should be undertaken with regard for the recommendations of Soil Engineers LTD.

SEWER (SERVICE) NOTES

1. All sewers and watermains are to be installed in accordance with the minimum requirements of the latest revision of the Ontario Provincial Standard Specifications, the Ontario Building Code and the Norfolk County Engineering Department.
2. Unless labelled specifically on the plans, all sewer pipe shall be as follows:
   - Sanitary PDCs shall be 125mm PVC SDR 28 (CSA B182.2).
   - Storm PDCs shall be 100mm PVC SDR 28 (CSA B182.2).
   - The minimum depth of a storm PDC shall be 1.5 metres from the finished property line elevation to the obvert of the PDC.
   - The minimum depth of a sanitary PDC shall be 2.25 metres from the finished property line elevation to the obvert of the PDC.
   - All pipe less than 200mm dia. shall be PVC SDR 28 (CSA B182.2).
   - Storm sewers 200mm to 450mm dia. with a depth of cover between 1.2m and 4.5m shall be PVC SDR 35 (CSA B182.2).
   - Storm sewers 200mm to 450mm dia. with a depth of cover less than 1.2m or greater than 4.5m shall be PVC SDR 35 (CSA B182.2).
   - Single catchbasin leads within the Right of Way shall be minimum 250mm PVC SDR 35 (CSA B182.2) constructed at minimum 1.00% slope.
   - Sanitary sewers 200mm to 525mm dia. shall be PVC SDR 35 (CSA B182.2).
   - Products shall be as per the approved list of manufactures provided by Norfolk County.
   - HDPE is not permissible for use unless specified otherwise.
   - 525 mm and larger concrete storm sewer pipe shall be reinforced to CSA A257.2.

   The Owner's Contractor shall be responsible for protecting the pipe during construction in the event that protective cover depths are not met due to interim conditions.
3. Service bedding: Pipe bedding spec. per bedding detail on sheet 17.
   Localized base improvement may be required for services bedded in loose, wet or dilatant silty/sandy subsoils, subject to the recommendations of the Geotechnical Engineer.
4. Backfill for service trenches: Services shall be backfilled with select native material or reclaimed granulars that are, in the opinion of the Geotechnical Engineer, suitable as backfill material and compacted as per the recommendations of a geotechnical engineer. Service trench backfill material shall be placed in uniform lifts not exceeding 300 mm in thickness, loose measurement, for the full width of the trench, and each layer shall be compacted according to OPSS 501 before a subsequent layer is placed. Backfill material shall be placed to a minimum depth of 900 mm above the crown of the pipe before power operated tractors or rolling equipment shall be used for compacting.
5. All precast concrete structures shall be bedded and backfilled with OPSS granular 'A' material compacted to 98% SPMDD, unless geotechnical conditions warrant otherwise.
6. All precast storm and sanitary sewer manholes shall be constructed in accordance with the current Ontario Provincial Standards. Catchbasin manholes (CBMH) shall typically be 1200mm inside diameter precast concrete with 600mm square standard catchbasin frames and grates, with sumps below the lowest invert unless otherwise noted on the plans. Catchbasins shall be 600mm square precast concrete with 600mm standard catchbasin frames and grates (OPSD) and 600mm sumps below the lowest invert.
7. All sanitary sewer lateral connections shall be installed using prefabricated tees. The use of any service saddle must be approved by Norfolk County Environmental Services Division. All connections shall conform to current OPSD 1006.010 and OPSS 410.
8. For single catchbasins, the minimum size of the connection shall be 250mm and the minimum grade shall be 1.0%. For double catchbasins, the minimum size of connection shall be 300mm and the minimum grade shall be 1.0%. For rear lot catchbasins, the minimum size of the connection shall be 300mm and the minimum grade shall be 0.5%.
9. 3.0 metre lengths of 150mm diameter perforated filter wrapped CSP pipe are to be installed as subdrains connected to two sides of each catchbasin and catchbasin manhole in pavement. The subdrains are to be located just below subgrade elevation and placed with perforations down (see detail on sheet 17). All exposed subdrain outlets (ie. not protected by precast structure) shall be protected with rodent grates, appropriately sized and grouted CSP outlet sleeves (OPSD 206.050) and rip rap protection (OPSD 810.010).
10. The Owner's Contractor is responsible for:
    (a) connecting any existing sewer or drain encountered during construction to a new sewer or into another existing sewer;
    (b) ensuring that there is no interruption of any surface or subsurface drainage flow that would adversely affect neighbouring properties or the safety of the construction site.
11. Per the requirements in OPSS 410.07.16.03 and 410.07.16.04, All sanitary sewers constructed within new subdivisions are to be subject to an Infiltration Test, an Exfiltration Test or Low Pressure Air Test, in accordance with OPSS 410, as determined by the Contract Administrator and the Contractor based on the situation. Detailed results of the testing are to be provided to the Contract Administrator and to the County for review and acceptance as part of the Conditional Inspection process prior to receiving a Conditional Certificate of Approval. Sanitary sewer maintenance holes within new subdivisions shall be tested for leakage in accordance with OPSS 407.
12. The Owner's Contractor shall construct temporary measures to control silt entering the storm drainage system. These measures are to remain in place until construction has been completed all to the specifications of the County Engineer. Geotextile and straw bale filters shall be installed around all existing and new CB's and CBMH's immediately upon installation in accordance with the detail. Straw bales are to remain in place until paving and/or sodding is complete.
13. Upon completion of sewer works, the Owner's Contractor is responsible for flushing and cleaning the sewers, manholes, catchbasin manholes and catchbasins and for successfully pulling a mandrel through the flexible sewer pipes. The Owner's Contractor shall undertake suitable mandrel tests for installed flexible sewer pipes in accordance with OPSS 410, and full video inspection of all sewers per OPSS 409 to the satisfaction of the Engineer.
14. All sewers and watermains are to be installed in accordance with the minimum requirements of the latest revision of the Ontario Provincial Standard Specifications and the Norfolk County Design Criteria. The Engineer will conduct periodic inspections to ensure that the proper standards are being met.
15. Any proposed substitutions are subject to approval by the Engineer.

HARDSCAPE SURFACING (ROADS, LANES, PARKING, CURBS, SIDEWALKS) NOTES

1. All dimensions for roadworks are to edge of pavement unless otherwise shown. Curb radii are shown to edge of pavement.
2. Material Conformance: Prior to import of materials to the work site, the Owner's Contractor shall make arrangements for the geotechnical analysis of Granular A and B materials to prove conformance with OPSS 1010. Asphalt mix designs shall be submitted to indicate conformance with OPSS 1150 and placement should be undertaken in accordance with OPSS 310. Concrete shall be placed in accordance with OPSS 353 and OPSS 1350.
3. All organic, unstable or unsuitable materials beneath the road allowances or paved areas must be removed and these areas backfilled with an approved fill material or OPSS Granular 'B' compacted to 98% SPMDD, all to the satisfaction of a Geotechnical Engineer.
4. All existing boulevards and road surfaces disturbed during construction shall be restored to a condition at least as good as original, all to the satisfaction of Norfolk County.
5. All on-site curb & gutter shall be constructed as per OPSD 600.100 unless otherwise specified.
6. Phasing of Asphalt Lifts: After placement of granular base and binder asphalt, a further 8 month delay is recommended for surface course asphalt placement to permit a pavement evaluation to be undertaken by the Geotechnical Engineer to identify repair or remedial works.
7. The Owner's Contractor shall raise all CB's to final grade and complete concrete curb setbacks prior to delayed sheet asphalt.
8. Any proposed substitutions subject to approval by the Engineer.

SITE BENCHMARKS:

BM1 – CUT CROSS SET IN TOP WEST CURB OF DOVER COAST BLVD AT 1ST HYDRANT #361 NORTH OF NEW LAKESHORE RD
ELEVATION = 189.760 METRES

BM2 – CUT CROSS SET IN TOP NW CORNER OF CONCRETE PAD FOR TRANSFORMER #60140 LOCATED ON THE EAST SIDE OF DOVER COAST BLVD, NW OF THE NW CORNER OF THE POND SOUTH OF PHASE 4
ELEVATION = 190.266 METRES

BM3 – TOP SPINDLE OF HYDRANT #368 LOCATED ON THE WEST SIDE OF DOVER COAST BLVD, 2ND HYDRANT NORTH OF NEW LAKESHORE RD.
ELEVATION = 191.396 METRES

BM4 – CUT CROSS SET TOP WEST CURB OF DOVER COAST BLVD AT HYDRANT #368, 2ND HYDRANT NORTH OF NEW LAKESHORE BLVD
ELEVATION = 190.413 METRES

BM5 – CUT CROSS SET IN TOP EAST CURB OF DOVER COAST BLVD AT 1ST CATCH BASIN NORTH OF SOUTH FUTURE EAST-WEST ROAD INTO PHASE 4
ELEVATION = 190.640 METRES

BM6 – CUT CROSS SET IN WEST CURB OF DOVER COAST BLVD AT HYDRANT #369, 3RD NORTH OF NEW LAKESHORE BLVD
ELEVATION = 191.152 METRES

WATERMAIN (SERVICE) NOTES

1. All watermains, services and appurtenances shall be constructed in accordance with the current County drawings, M.O.E. guidelines, Ontario Provincial Standards and Specifications and AWWA standards and specifications. The Engineer will conduct periodic inspections to ensure that the proper standards are being met.
2. The Contractor shall provide 48 hours advanced notice to the County Environmental Infrastructure Services Divisions prior to undertaking any work on the water system.
3. Unless labeled specifically on the plans, all watermain pipe shall be as per the approved products in the County's Design Criteria. All watermain/service shall be installed to a depth of cover of 1.7–2.2m unless shown otherwise on the plan.
4. Watermains and services shall be bedded in Class B bedding with 150mm Granular A bedding and 300mm Granular A cover, compacted to 95% Proctor Density.
5. All PVC watermains and all fittings shall be restrained and secured by means of mechanical restraining rings which meet or exceed all requirements of Uni-Bell B-13. All restrainers are to be installed to manufacturer's specifications and installation procedures.
6. Tracer wire shall be T.W.U., No. 10 gauge, stranded and insulated copper wire with 60 mil of black, cross-linked polyethylene (XLPE) insulation specifically manufactured for direct burial applications. Tracer wire to be installed per Section 10.6.1. of Norfolk County's Design Criteria, any deviation from the installation instructions must be approved by the Environmental Services Division of Norfolk County.
7. Where cover is less than 1.7m (even temporary conditions), the watermain/service shall be adequately insulated over the affected length as per the County detail on sheet 17.
8. New fire hydrants shall conform to AWWA C502. Hydrants shall have two 63.5mm (2.5") threaded male hose connections and one 101.6mm (4") Storz front pumper port. The front pumper port shall face the street.
9. Upon completion of water service installation, the Contractor is responsible for flushing, hydrostatic testing, disinfection and bacteriological testing of the water service in accordance with Norfolk County specifications.
10. Every water service shall be metered in accordance with Norfolk County standards.

Watermains (unless specified otherwise)
- PVC pipe 100–300mm shall be AWWA C900 DR18 (CSA B137.3)
- PVC pipe 350mm and greater shall be AWWA C900 DR25 (CSA B137.3)
- All PVC pipe and PVC fittings in sizes 150mm to 300mm are to be blue in colour, with push-on gasket joints and shall conform to AWWA C907 and CSA B137.3 or shall be epoxy coated ductile iron compact fittings and shall conform to AWWA C153/ANSI A21.53
- Ductile iron pipe shall be designed and manufactured in accordance with AWWA C150 & C151 / ANSI A21.50 & A21.51 and shall be cement mortar lined in accordance with AWWA C104/ANSI A21.4. Ductile iron pipe shall be a minimum thickness of Class 52. Shall be installed per section 10.4.1. in Norfolk County Design Criteria.
- Fittings for ductile iron pipe shall conform to AWWA C153/ANSI A21.53, having mechanical joint ends conforming to AWWA C11/ANSI A21.11 and shall be cement lined in accordance with AWWA C104/ANSI A21.4.

Services
• All water service connections shall be 25.4 mm (1") diameter PEX in accordance with CSA-B137.5, ASTM's F876 & F877, and NSF 61. They will require a Connection Permit from Norfolk County.
• Services to be installed in accordance with Section 10.10.0 in Norfolk Design Criteria.
• Service connections to PVC mains shall be connected by using PVC moulded/fabricated tee. No saddles will be permitted within a new subdivision. Stainless steel saddles may be used for connections to an existing main.
• Curb stops to be located 300mm from property line on street side; and shall conform to ANSI/AWWA C800 and ANSI/NSF Standard 61. All curb stops shall be equipped with electrical grounding tail nuts and shall be corrosion protected with a zinc or magnesium anode.
• Curb stops for copper services shall have compression connections and shall be fluorocarbon coated balls valves without drains.

Hydrants
• Hydrants to be AWWA C502.
• Hydrants shall open left (counter clockwise) and close right (clockwise).
• Hydrants shall be painted as per Norfolk County Fire Department direction and have cast iron caps.
• Hydrants shall have all drain holes plugged.
• Hydrant leads shall be 150mm and shall be connected using a gate valve and anchor tee.
• To be installed minimum 1.5m from any driveway; minimum cover of 1.7m and maximum 1.9m; flange to be graded 0mm to 75mm from finished grade.

Valves
• Shall be gate valves and conform to AWWA C509.
• Valves are to open counter-clockwise;
• Valve boxes shall be No. 5 screw type with No. 6 base and centering ring. The valve box cover shall have the word "WATER" or a large "W" cast into its upper surface.
• Valves typically are to be located in line with the extension of the property limit line.
• Valves shall be the same sizes as the watermain.

DIAMETER (mm)	MIN. NO. OF STEEL RODS (19mmø)	MIN. LENGTH WITHIN WHICH JOINTS TO BE RESTRAINED ON EACH SIDE OF FITTINGS (m)				
		11-1/4°	22-1/2°	45°	90° & TEES	DEAD END & VALVES
100	2	4.0			4.0	8
150	2				5.5	10
200	2				7.0	13
250	4				8.5	16
300	4				10	19

NORFOLK COUNTY WATERMAIN RESTRAINT TABLE

EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION	DETAILS	No.	REVISIONS	DATE	CONSULTANT	No.	REVISIONS	DATE	CONSULTANT
					DESIGN BY SW	1	1ST ENGINEERING SUBMISSION	SEPT. 05/25	DEVENG				
					DRAWN BY SW								
					CHECKED BY DH/JF								
					F.BK. ***								

FILE: DEL13-124P4 – NOTES AND DETAILS.DWG

CONSULTANT OR DIVISION

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(519) 672-8310

Paris Office
31 Mechanic St., Unit 301
(519) 442-1441

development engineering (London) Limited
CONSULTING CIVIL ENGINEERS

ENGINEER'S SEAL
LICENSED PROFESSIONAL ENGINEER
D. J. HOEVENAARS
100149139
Sept 5, 2025
PROVINCE OF ONTARIO

SCALE

TITLE
DOVER COAST – PHASE 4
PORT DOVER, ONTARIO

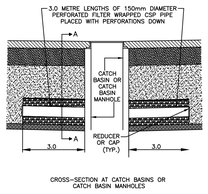
CONSTRUCTION NOTES

PROJECT No.
DEL13-124P4

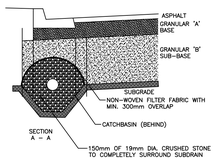
SHEET No.
16

PLAN FILE No.

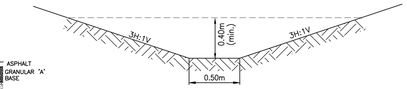
autoplotted: Sep 05/25–1:28pm DEL13-124P4 – Notes and Details.dwg



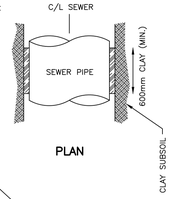
CROSS-SECTION AT CATCH BASINS OR CATCH BASIN MANHOLES



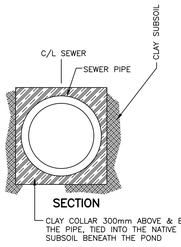
TYPICAL SUBDRAIN INSTALLATION DETAIL AT CB, TICB, CBMH'S
NTS



TYPICAL CUTOFF SWALE
NTS



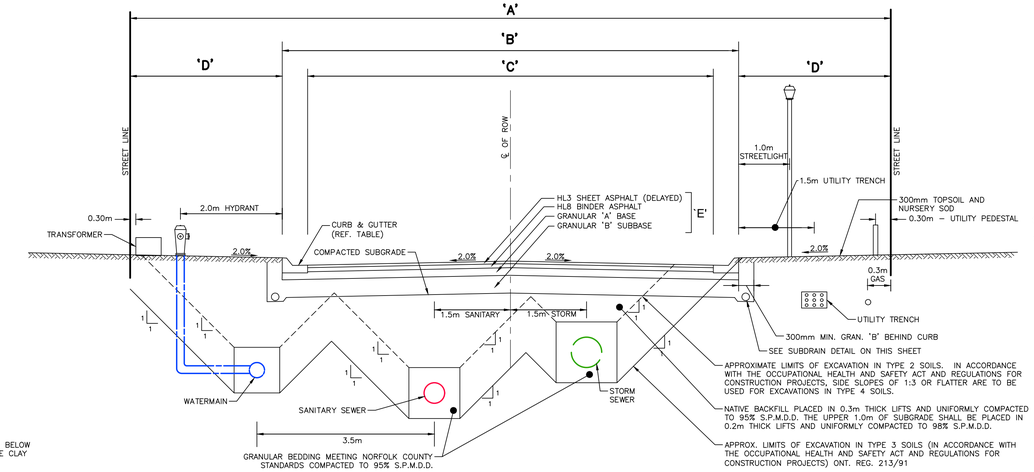
PLAN



SECTION

CLAY COLLAR 300mm ABOVE & BELOW THE PIPE, TIED INTO THE NATIVE CLAY SUBSOIL BENEATH THE POND

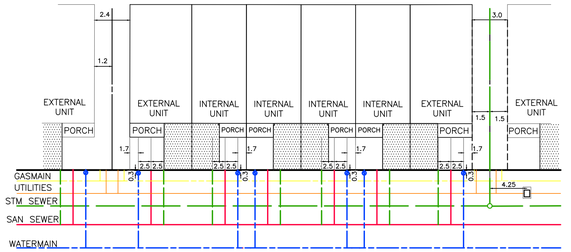
CLAY COLLAR
NTS



NOTES:
- TRENCH CONSTRUCTION IS TO BE IN ACCORDANCE WITH THE LATEST HEALTH & SAFETY REGULATIONS (213/91)
- ENCOUNTERED SOIL AND GROUNDWATER CONDITIONS OR NEED TO SUPPORT EXISTING UTILITIES MAY WARRANT EXCAVATION SHORING OR OTHER CONSTRUCTION METHODS AS NECESSARY
- REFER TO GEOTECHNICAL REPORT FOR ADDITIONAL RECOMMENDATIONS
- SHOULD CONSTRUCTION TAKE PLACE UNDER WET SUB-GRADE OR WEATHER CONDITIONS, SUB-GRADE PREPARATION AND GRANULAR REQUIREMENTS SHOULD BE REVIEWED BY THE GEOTECHNICAL ENGINEER.
- THE ASPHALT SHALL BE SUPPLIED AND PLACED IN ACCORDANCE WITH O.P.S.S. FORMS 310 AND 1150
- COMPACTION OF GRANULAR A AND GRANULAR B TO 100% SPMDD
- COMPETENT SUBGRADE MUST BE COMPACTED TO 98% SPMDD AS APPROVED BY GEOTECHNICAL ENGINEER
- ALL SIDEWALK AREAS TO BE FOUNDED UPON 100mm GRANULAR 'A' COMPACTED TO 100% SPMDD

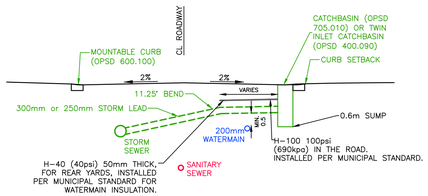
STREET NAME	CURB TYPE	'A' ROW WIDTH (METRES)	'B' BACK OF CURB (METRES)	'C' ASPHALT WIDTH (METRES)	'D' BOULEVARD WIDTH (METRES)	'E' (MILLIMETRES) ASPHALT HL3	'E' (MILLIMETRES) ASPHALT HL8	'E' (MILLIMETRES) GRANULAR A	'E' (MILLIMETRES) GRANULAR B
STREET A, B, C, D	OPSD 600.10	14.00	9.00	8.00	2.50	40	50	150	300

PRIVATE ROAD TYPICAL CROSS SECTION

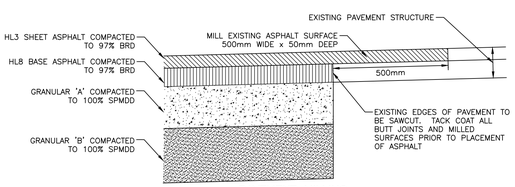


STREET TOWN STANDARD SERVICING LOCATIONS
NTS

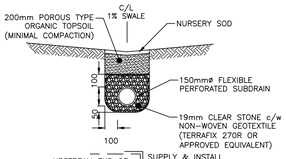
NOTE:
- SANITARY PDC's (MIN. 125mm DIAMETER; SDR 28 PVC) SHALL BE CONSTRUCTED TO MINIMUM 2.25m COVER BELOW FINISHED GRADE AT PROPERTY LINE UNLESS OTHERWISE NOTED.
- WATER SERVICES SHALL BE 25.4mm (1") CSA-B137.5 PEX CONSTRUCTED TO MINIMUM 1.70m COVER BELOW FINISHED GRADE AT PROPERTY LINE.



TYPICAL CATCHBASIN LEAD CROSS SECTION
1:50

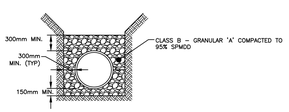


PAVEMENT MILLING
N.T.S.



SUBDRAIN TO FOLLOW LINE AND GRADE OF GRASS SWALE. CONNECT TO CB's AND CBMH's AT INVERT 0.6m BELOW LIDS.

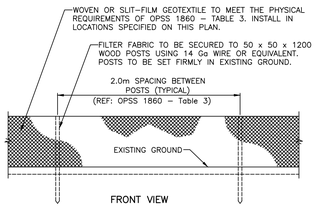
TYPICAL PRIVATE SUBDRAIN INSTALLATION
NTS



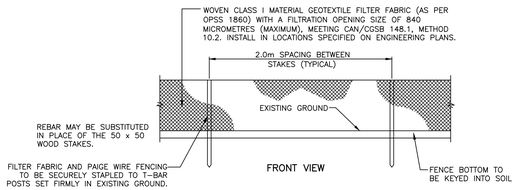
RIGID & FLEXIBLE PIPE

NOTES:
- BEDDING FOR SERVICE LATERALS SHALL BE EQUIVALENT TO THE BEDDING SPECIFIED FOR MAINLINE SEWER PIPE.
- PIPE BEDDING SHALL BE PLACED SIMULTANEOUSLY ON BOTH SIDES OF THE PIPES AND THE COVER MATERIAL SHALL BE PLACED THE FULL WIDTH OF THE TRENCH.

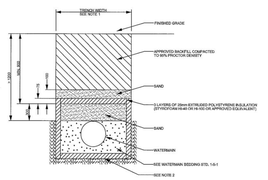
BEDDING STANDARD FOR GRAVITY AND PRESSURE PIPE
NTS



LIGHT-DUTY SILT FENCE
(REF: OPSD 219.11)
NTS

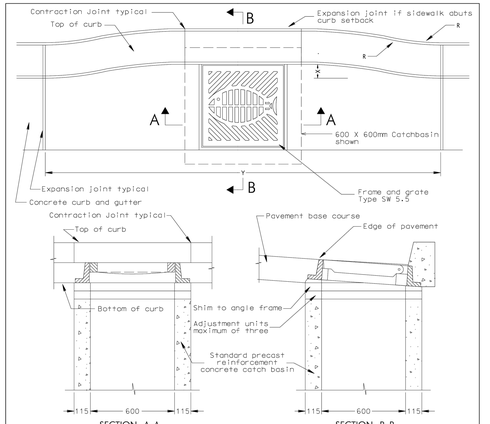


HEAVY-DUTY SILT FENCE
OPSD 219.130
NTS



NOTE
1. MINIMUM TRENCH WIDTH TO BE O.D. PLUS 600mm. MAX TRENCH WIDTH TO BE O.D. PLUS 750mm.
2. INSULATING THE BOTTOM OF THE TRENCH MAY BE REQUIRED UNDER CERTAIN CIRCUMSTANCES (i.e. OVER A CULVERT).

NORFOLK COUNTY	REV. DATE: NOVEMBER 2011	
	APPROVED BY: BF	DRAWN BY: THH
WATERMAIN INSULATION DETAILS	STD. DWG. NUMBER	SCALE: N.T.S.

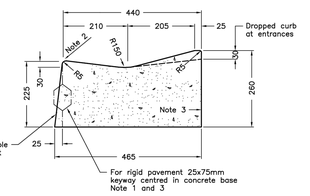


NOTES:
1. "X" – Represents the offset distance required to accomodate the various Ontario Provincial Standard Drawing curb types.
"Y" – Represents the length of the concrete curb setback required to accomodate the various Ontario Provincial Standard Drawing curb types.

O.P.S.D No.	"X" Distance	"Y"	
600.01	200	2600	1500
600.04	300	3600	2000
600.06	325	3900	2000

A. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

2. Concrete curb setbacks shall not be implemented when curb face sidewalk is specified



NOTES:
1 When curb and gutter is adjacent to concrete pavement or base, this drawing shall be used in conjunction with OPSD 552.010 and 552.020.
2 Flexible and composite pavement shall be placed 5mm above the adjacent edge of gutter.
3 For slipforming procedure a 5% batter is acceptable.
A Treatment at entrances shall be according to OPSD 351.010.
B Outlet treatment shall be according to the OPSD 610 Series.
C The transition from one curb type to another shall be a minimum length of 3.0m, except in conjunction with guide rail where it shall be according to the OPSD 900 Series.
D All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2012	Rev 2
CONCRETE MOUNTABLE CURB WITH NARROW GUTTER		
	OPSD 600.100	

EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION

DETAILS
DESIGN BY SW
DRAWN BY SW
CHECKED BY DH/JF
F.BK. ***

No.	REVISIONS	DATE	CONSULTANT
1	1ST ENGINEERING SUBMISSION	SEPT. 05/25	DEVENG

No.	REVISIONS	DATE	CONSULTANT

FILE: DEL13-124P4 – NOTES AND DETAILS.DWG

CONSULTANT OR DIVISION

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Paris Office
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(519) 442-1441

development engineering (London) Limited
CONSULTING CIVIL ENGINEERS

ENGINEER'S STAMP: LICENSED PROFESSIONAL ENGINEER D. J. HOEVEMAARS 100149139 Sept 5, 2025 PROVINCE OF ONTARIO

SCALE

TITLE
DOVER COAST – PHASE 4
PORT DOVER, ONTARIO

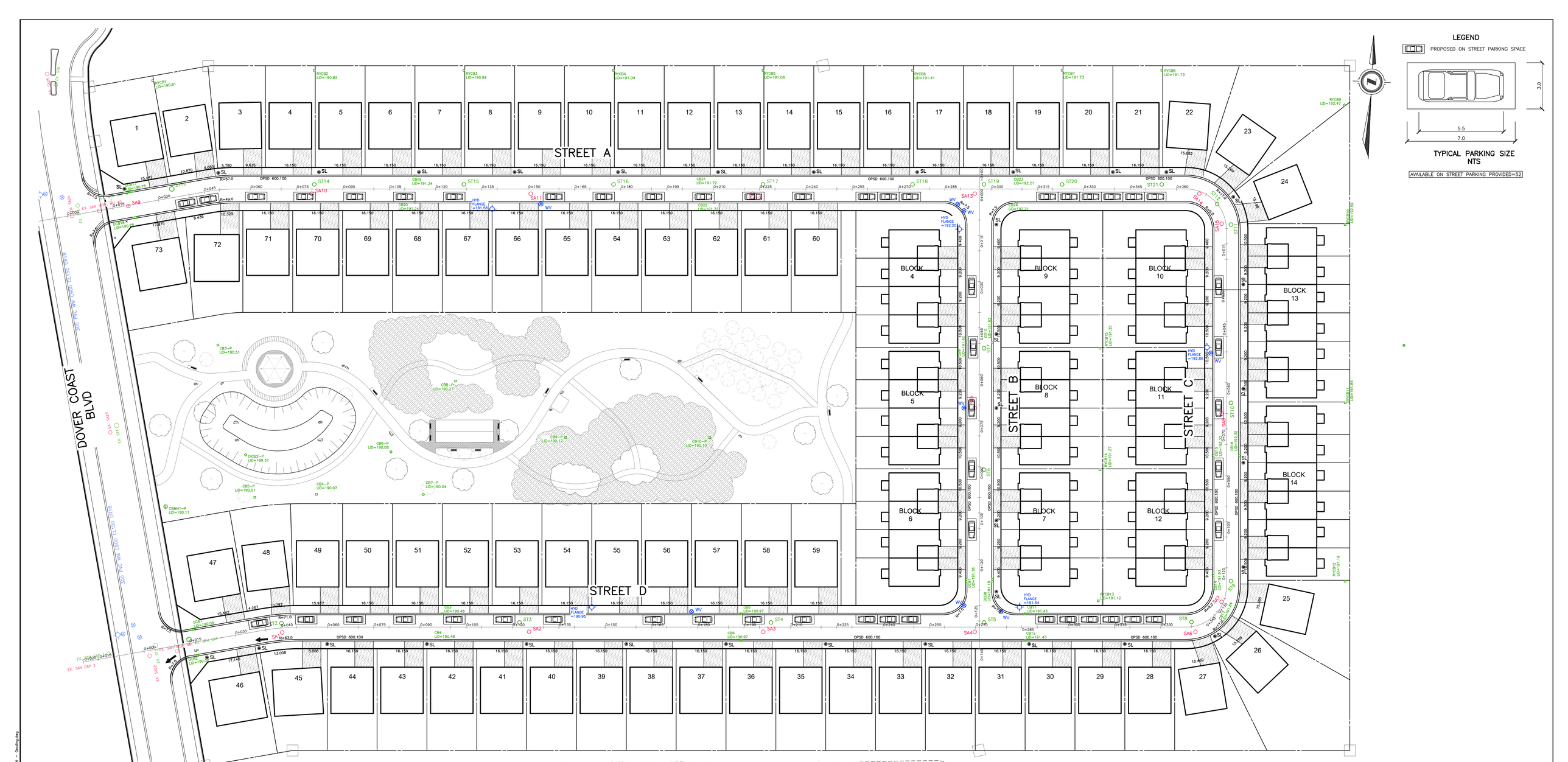
CONSTRUCTION DETAILS

PROJECT No. DEL13-124P4

SHEET No. 17

PLAN FILE No.

plotted: Sep 05 (Fri) - 1:28pm DEL13-124P4 - Notes and Details.dwg



EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION

DETAILS
DESIGN BY SW
DRAWN BY SW
CHECKED BY DH/JF
F.BK. ***

No.	REVISIONS	DATE	CONSULTANT
	1ST ENGINEERING SUBMISSION	SEPT. 05/25	

No.	REVISIONS	DATE	CONSULTANT

FILE: DEL13-124P4 - GRADING.DWG

CONSULTANT OR DIVISION

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development engineering (london) Limited
CONSULTING CIVIL ENGINEERS

ENGINEER'S STAMP
LICENSED PROFESSIONAL ENGINEER
D. J. HOEVENAARS
100149139
Sept 5, 2025
PROVINCE OF ONTARIO

SCALE
SCALE - 1:500
5 0 10m
NTS IF REDUCED FROM 22"X40"

TITLE
DOVER COAST - PHASE 4
PORT DOVER, ONTARIO

PARKING PLAN

PROJECT No.
DEL13-124P4

SHEET No.
18

PLAN FILE No.

LEGEND

- Subject Boundary
- Townhouse Units

AREA STATISTICS

Residential Single Detached (16.15m Lots)		4.21 ha
Townhouse Units (9.20m Lots - Blocks 4-14)		1.64 ha
Park (Block 2)		1.44 ha
Path (Block 1, 3)		0.03 ha
R.O.W. (Street A - Street D)		1.36 ha
Gross Area:		8.68 ha
Existing SWM Easement (Block 15,16,17)		0.008 ha

NOT INCLUDED IN RESIDENTIAL SINGLE DETACHED LOT AREA CALCULATIONS

UNIT COUNT

Residential Single Detached (16.15m Lots)	73
Townhouse Units (9.20m Lots - Blocks 4-14)	48
Total Lots	121

NOTES:
All measurements are in meters.

KEY PLAN

Subject Boundary

Metric Scale
0 500 1000

0 15 30 45 60
metric scale

CONCEPT SITE PLAN

Part of Lot 15 and 16, Concession 1
(Geographic Township of Woodhouse)
Norfolk County

Dover Coast Blvd.

BLACKTHORN Development Corp.

Land Development | Land Use Planning | Project Management | Government Relations

Scale	Date	Drawing Number	Rev.	Drawn
1:800	September 10, 2025	2445-22		JD

BLACKTHORN Development Corp.

Land Development | Land Use Planning | Project Management | Government Relations

DELIVERED VIA COUNTY PORTAL UPLOAD

October 16, 2025

County of Norfolk
Community Development Division
12 Gilbertson Drive
Simcoe, Ontario
N3Y 3N3

Attention: **Ms. Alisha Cull, BES, MCIP, RPP, Ec.D.**
Manager of Planning Services, Planning and Realty Services, Community and Development Services

Dear Madam,

RE: **Dover Coast Phase 4**
Proposed Draft Plan of Subdivision, Draft Plan of Condominium *(Common Element)* & Site Plan Control
Part Lot 15, Wdh Concession 1 & Part 36 Plan No. 37R-9924 *("Subject Lands")*
Roll Number 3310337040192960000

Our office is pleased to enclose Applications for a Draft Plan of Subdivision, Draft Plan of Condominium *(Common Element)* and Site Plan Control, to implement development of the Phase 4 Dover Coast lands.

The enclosed Applications and Submission Items were confirmed and informed by means of a Pre-Application Consultation Meeting held on November 13th, 2024, with the final Comments and Requirements provided February 18th, 2025.

Introduction

This Submission is being advanced in accordance with the County's requirements, with this Cover Letter providing for a description of the lands subject to this Submission including a description of the proposed development, review of existing policies and regulations including required *Planning Act* applications, summary of supporting studies, an overview and justification of the proposed Phase 4 development.

Property Location and Description

The Subject Lands are vacant, located on the east side of Dover Coast Boulevard, north of New Lakeshore Road, west of E Quarter Line and south of Highway 6. The Subject Lands abut and are surrounded by the existing Links at Dover Coast public golf course.

The Subject Lands have a total Site Area of approximately 8.68 Hectares *(21.4 Acres)*.

As mentioned, development of the Subject Lands represents the 4th phase of development of the overall Dover Coast development being an Adult Lifestyle Community.

The Subject Lands do not contain any Natural Heritage Features and can accommodate the proposed development consisting of residential single detached and townhome dwellings.

The Subject Lands include an existing stormwater management easement, located at the southwest portion of the lands. The existing easement will be maintained and reconfigured through the Detailed Design process.

As mentioned, the Subject Lands are surrounded by the existing Links at Dover Coast public golf course as well as existing residential uses and limited existing commercial uses.

Description of Proposed Development

As mentioned, the Subject Lands are intended to be developed for residential uses consisting of single detached dwellings and townhouse dwellings, totaling 121 dwellings.

Two site accesses are proposed off of Dover Coast Boulevard with 14-metre Private Streets, proposed, internally, two pedestrian walkway paths and a Privately-Owned Publicly Accessible Space *(e.g. POPS)* proposed centrally.

Statistically, the proposed development includes:

- 73 Single Detached Dwellings with minimum lot*(s)* frontages of 16.15 metres *(Approx. 53 Feet)*.

- 48 Townhouse Dwellings with minimum lot*(s)* frontages of 9.2 metres *(Approx. 30 Feet)* forming part of 11 Townhome Blocks.

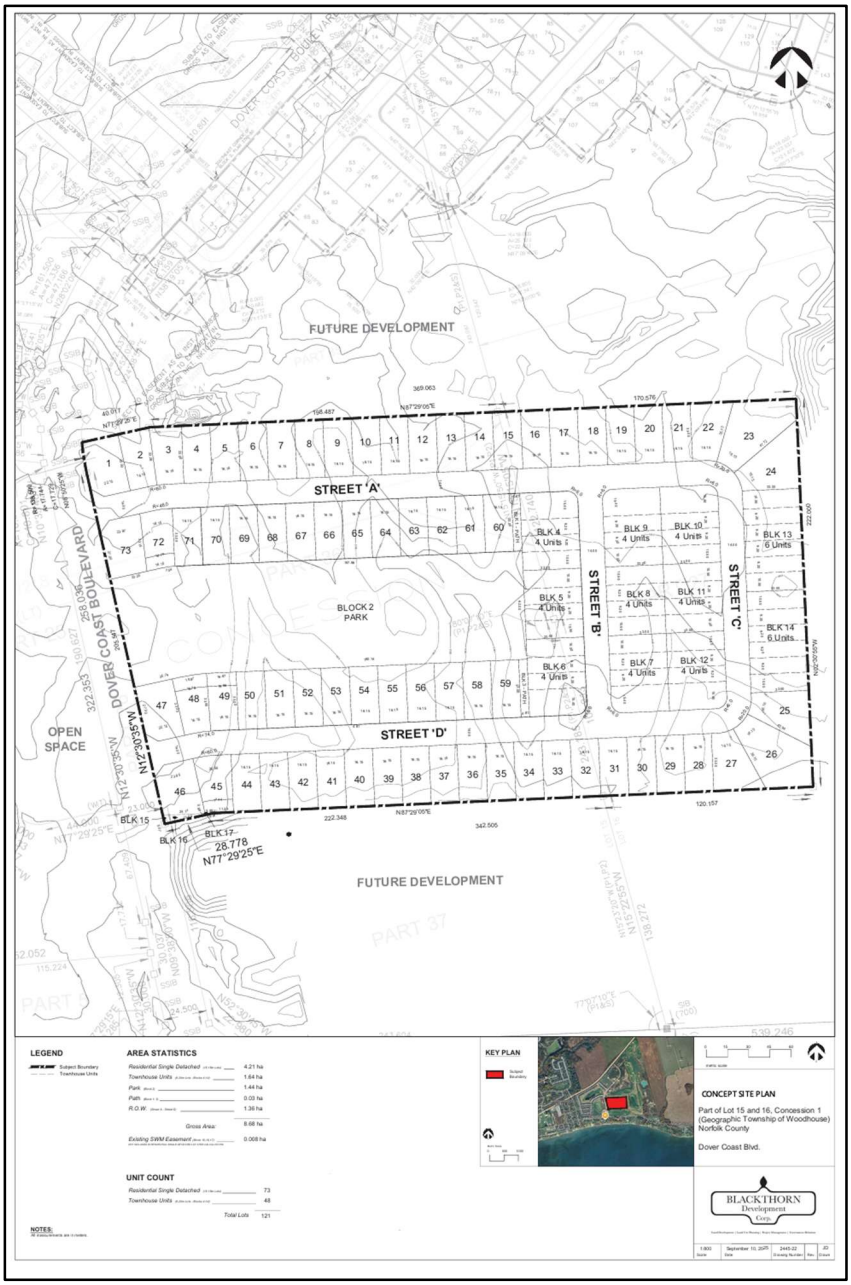
- 14-metre wide Private Rights of Way.

- A POPS of approximately 1.44 hectares *(Approx. 3.55 Acres)*, centrally located with a dry basin, proposed, for stormwater management purposes.

- Two pedestrian pathways, 4.81 metres wide *(Approx. 15.7 feet)* provided connections from the POPS to the Private Street.

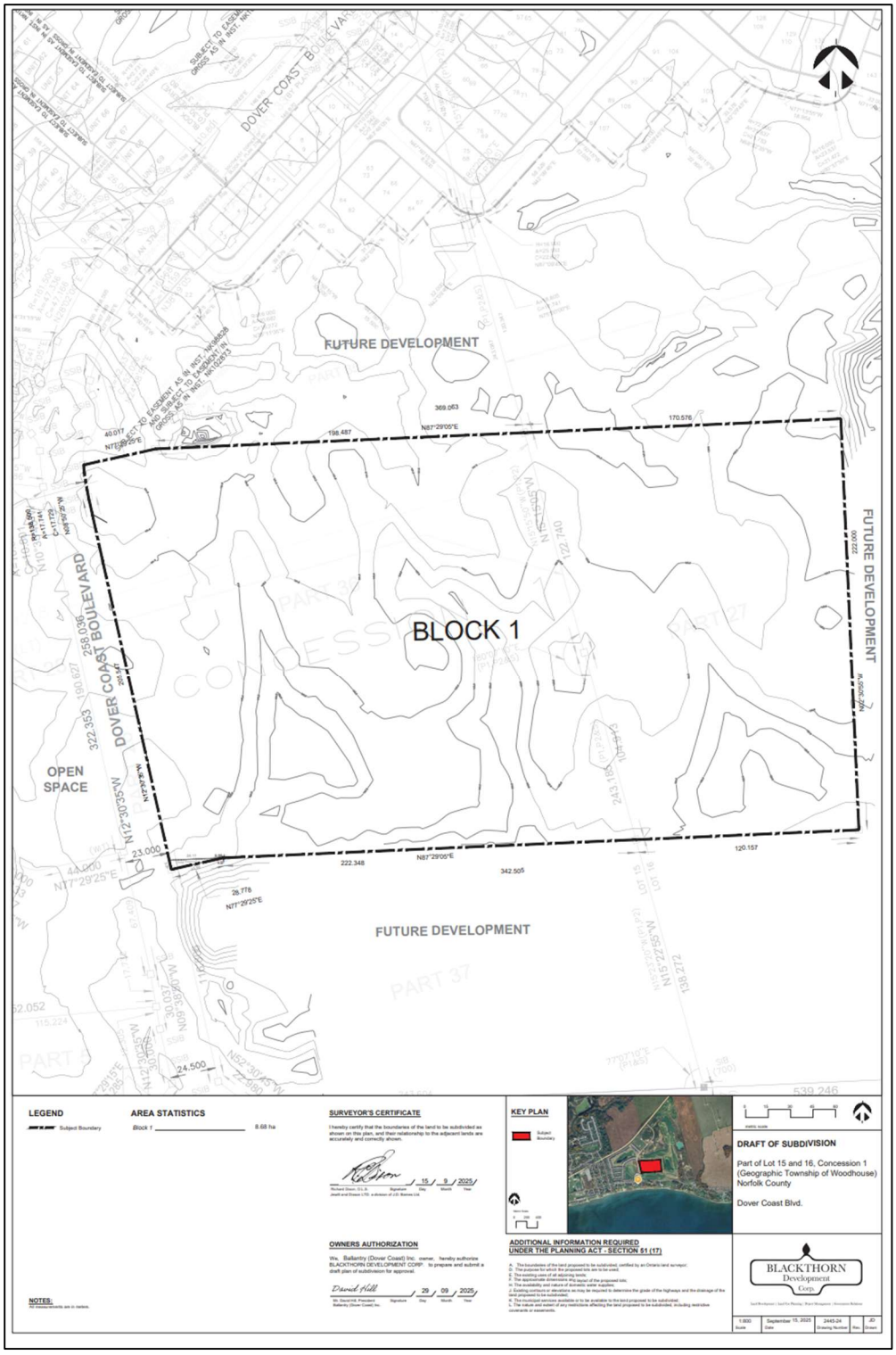
The proposed development's tenure will be a Common Element Plan of Condominium by virtue of a Plan of Subdivision creating the development block and Condominium Plan creating the parcels of tied land, as outlined in the following Figures:

Figure 1: Concept Site Plan



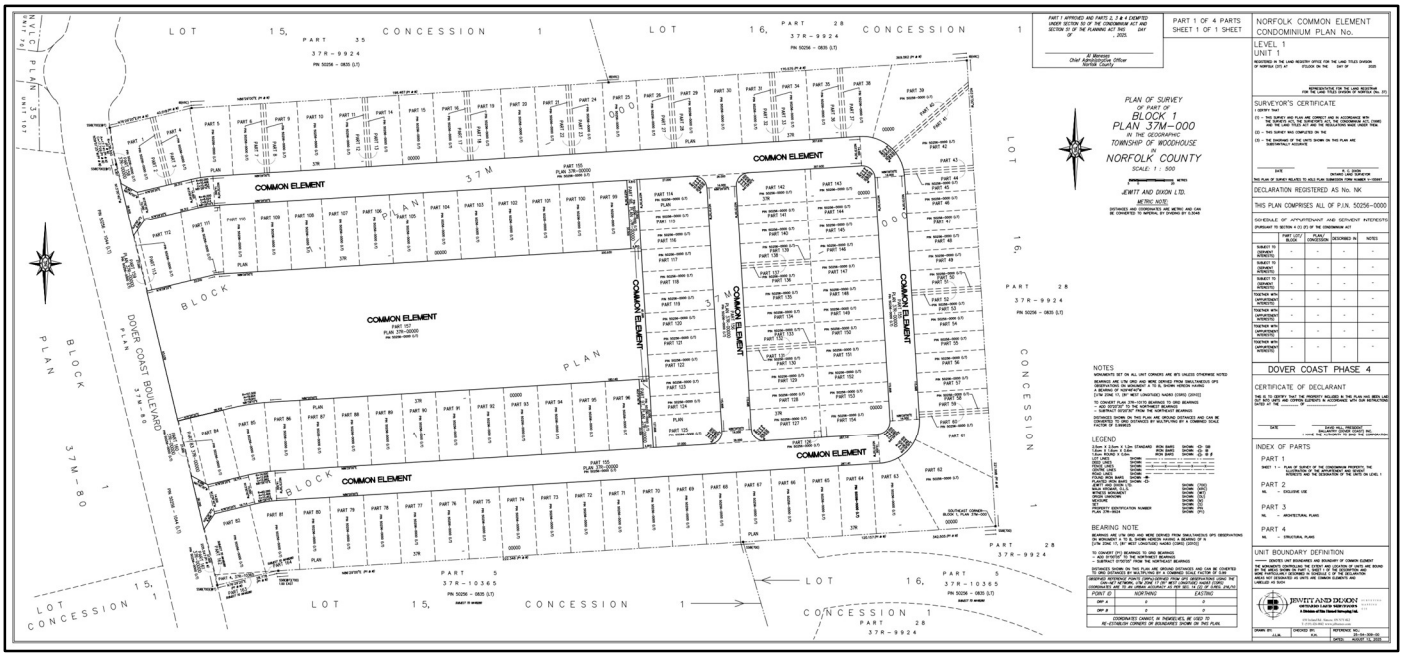
Source: Blackthorn Development Corp.

Figure 2: Draft Plan of Subdivision



Source: Blackthorn Development Corp

Figure 3: Draft Plan of Condominium *(Common Element)*



Source: Jewit and Dixon Ontario Land Surveyors

Existing Land Use Policies, Regulations & Required Planning Applications

Development and land use planning of the Subject Lands is governed by Provincial, and Municipal polices.

Provincial Policy:

Provincial policy includes the *Planning Act* and *Provincial Planning Statement (2024)* that combines and replaces the existing *Provincial Policy Statement, 2020 and A Place to Grow: Growth Plan for the Greater Golden Horseshoe, 2020*.

The new *Provincial Planning Statement (2024)* outlines the Province's policies governing land use planning including growth management, settlement boundary expansions, housing and employment areas, natural and cultural heritage, transportation, and infrastructure. All development applications and Municipal Official Plans including Zoning By-laws must be consistent with the new *Provincial Planning Statement (2024)*, as required by Section 26 of the *Planning Act*.

Norfolk County Official Plan:

Per the January 1st, 2023, consolidated *Norfolk County Official Plan*, the Subject Lands are designated 'Urban Residential' and within the Port Dover Urban Area.

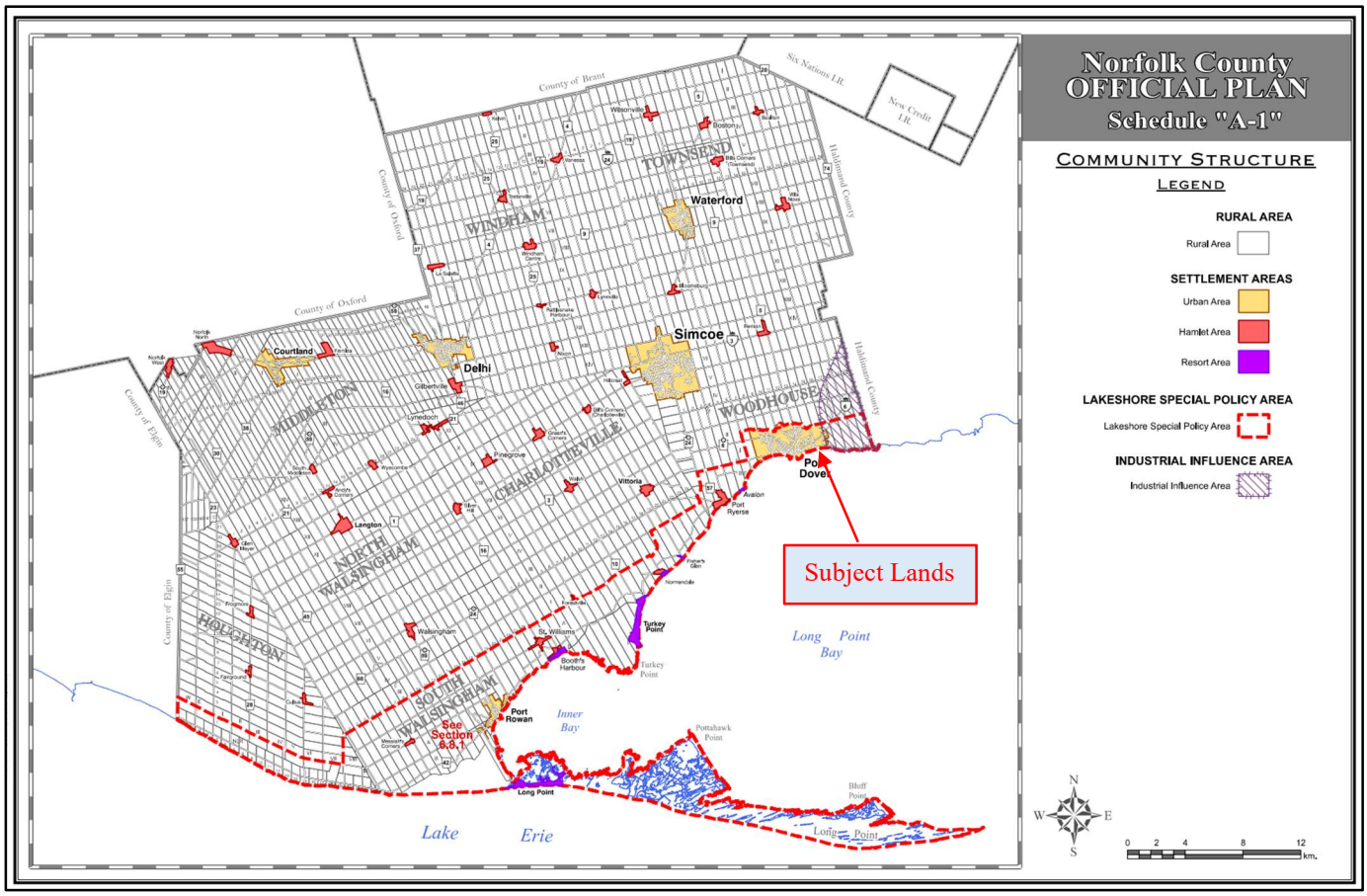
The 'Urban Residential' designation permits urban dwellings including the proposed Single Detached Dwellings and Townhouse Dwellings with the opportunity to include Garden Suites, on

the Single Detached Lots, Accessory Units, and Home Occupations in accordance with the specific policies of the Official Plan.

To permit the proposed development, of the Subject Lands for residential uses, a County Official Plan Amendment is not required.

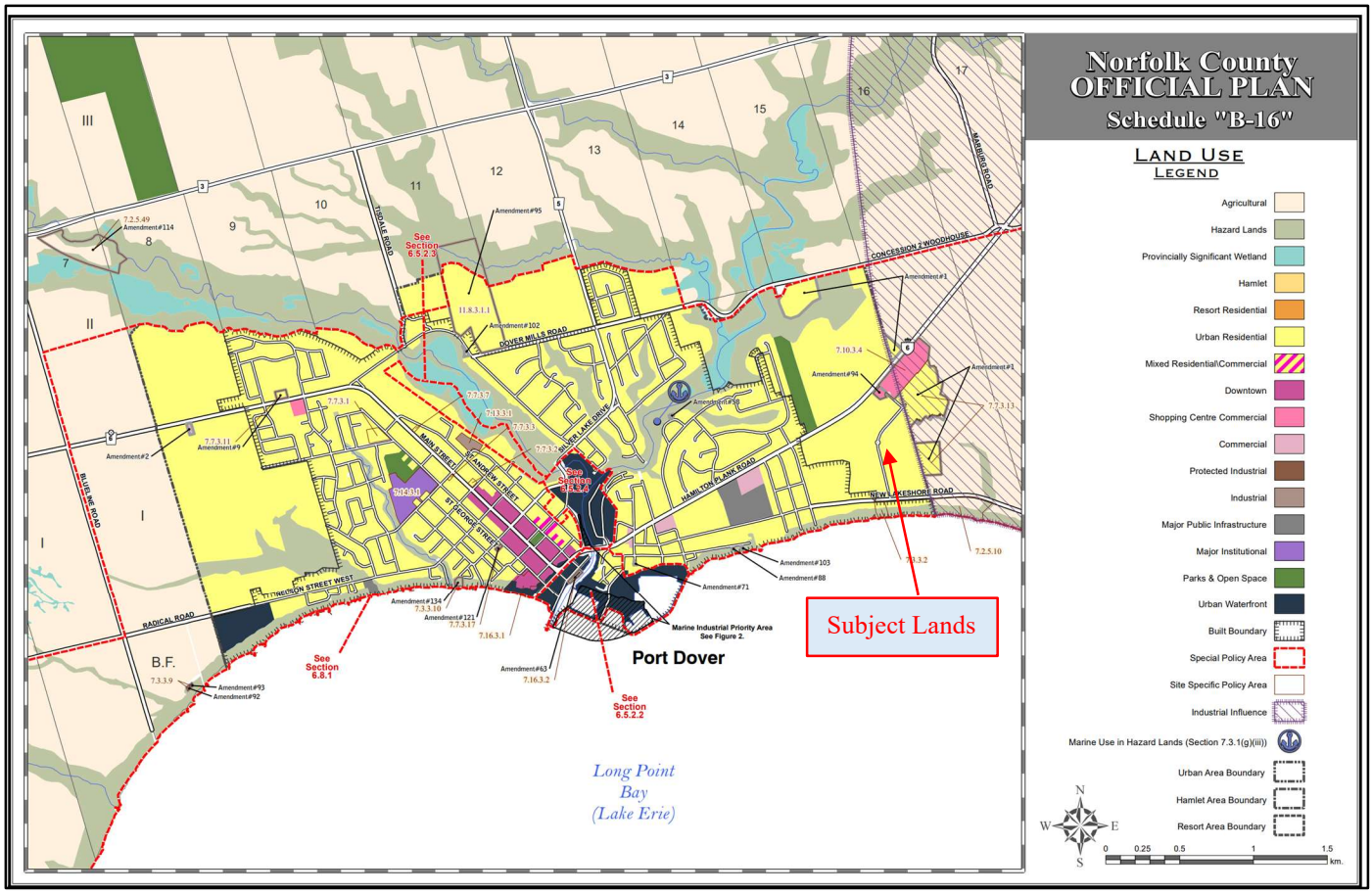
The Subject Lands also form part of the *Lakeshore Policy Area Secondary Plan* per Schedule "A-1" of the County Official Plan.

Figure 4: County of Norfolk Official Plan, A-1- Community Structure



Source: County of Norfolk Official Plan, January 2023 Office Consolidation

Figure 5: County of Norfolk Official Plan, B-16 – Land Use Designations



Source: *County of Norfolk Official Plan, January 2023 Office Consolidation*

Norfolk County Zoning By-law No.1-Z-2014, as amended:

The Subject Lands are zoned 'Residential R4-Zone' with a Holding Symbol *(H)* per the County of *Norfolk Zoning By-law No. 1-Z-2014*, as amended and consolidated as of January 1st, 2021.

The proposed dwelling types are permissible in accordance with the 'Residential R4-Zone' and applicable Special Provision No. 14.543, of the Zoning By-law, which permits additional uses including the proposed Single Detached Dwellings.

In evaluating conformity to the Zoning By-law, the proposed development is subject to various specific provisions including but not limited to lot area, lot frontage, building setbacks, separation distances, building height, and maximum number of multi-unit dwellings not exceeding 40 percent of the total number of dwelling units within each development phase.

For the purposes of zoning interpretation, the intent of the Special Provision was for the entire development or Subject Lands are to be considered one lot. Meaning, the noted Special Provision

does not include a rear, front, interior side or exterior side yard setbacks and accordingly, the setbacks within Section 5.4.2, of the Zoning By-law, do not apply.

The Holding Symbol, applicable to the Subject Lands will remain until such a time as engineering drawings have been approved, the completion of the roundabout at Dover Coast Boulevard and Highway 6, draft plan conditions have been cleared including the posting securities and entering into a development agreement which will be registered on title.

Figure 6: Norfolk County Zoning By-law No.1-Z-2014 Map

Source: County of Norfolk Community Web Map

While a Zoning By-law Amendment is not required to implement the proposed development, should any relief by required from the applicable zoning provisions, during the Building Permit stage of the process, a Minor Variance application can be considered.

Lastly, it should be noted the Subject Lands are not located within the Long Point Region Conservation Authority Regulated Area.

To permit the proposed development a Draft Plan of Subdivision and Site Plan Control applications required, in accordance with the Planning Act.

A Draft Plan of Condominium *(Common Element)* is also required, to establish tenure.

Supporting Studies & Plans

To assess the Subject Lands and the proposed development various Supporting Studies and Plans were prepared including an Urban Design Brief, Engineering Memorandums together with a Hydrant Flow Test and Detailed Engineering Plans with Parking Plan, a Park Landscape Concept Plan, and Streetlighting Plans.

As the proposed development represents a phase of the overall Dover Coast Community, the provided Studies and Plans are specific to Phase 4 and are supplementary to prior Studies and Plans undertaken.

Furthermore, the Studies and Plans were prepared in accordance with the Pre-Application Consultation Meeting comments and requirements.

The Studies and Plans demonstrate the Phase 4 development, as proposed, is implementable in accordance with the County's design standards, and a high-quality urban design aesthetic.

It should be noted; the previously prepared and filed Stage 1 and 2 Archaeological Assessments are being relied upon in support of the Phase 4 lands and included with this Submission including an Acknowledgement Letter from the Ministry of Heritage, Sport, Tourism, and Culture Industries.

Overall, the Supporting Studies and Plans including the Stage 1 and 2 Archaeological Assessments, Urban Design Brief, Engineering Memorandums together with a Hydrant Flow Test and Detailed Engineering Plans with Parking Plan, a Park Landscape Concept Plan, and Streetlighting Plans informed the proposed development's design, while also providing for important analysis to ensure conformity with various provincial and County policies and regulations.

The Supporting Studies and Plans also provided for meaningful input considered as part of this Planning Justification Brief, in assessing the appropriateness and land use planning objectives associated with the proposed development of the Subject Lands.

In summary, the Supporting Studies have demonstrated the proposed development is feasible and does not pose any adverse impacts being representative of good land use planning.

Planning Policy Analysis and Justification Brief

As mentioned, the Subject Lands are governed Provincial and Municipal policies and regulations including the *Planning Act* and *Provincial Planning Statement (2024)* which combines and replaces the existing *Provincial Policy Statement, 2020 and A Place to Grow: Growth Plan for the Greater Golden Horseshoe, 2020*.

The new *Provincial Planning Statement (2024)* outlines the Province's policies governing land use planning including growth management, settlement boundary expansions, housing and employment areas, natural and cultural heritage, transportation, and infrastructure. All development applications and Municipal Official Plans including Zoning By-laws must be consistent with the new *Provincial Planning Statement (2024)*, as required by Section 26 of the *Planning Act*.

Municipally, the Subject Lands are governed by the *County of Norfolk Official Plan* and *County of Norfolk Zoning By-law No. 1-Z-2014*, as amended.

The following is an assessment and analysis of the applicable Provincial and Municipal land use policies including justification for the proposed Draft Plan of Subdivision, Draft Plan of Condominium *(Common Element)* and Site Plan Control applications.

Planning Act, Matters of Provincial Interest, Sections 2 & 51 *(24)*:

Section 2 of the *Planning Act* requires that an approval authority, in carrying out its responsibilities under the *Act*, "shall have regard to" matters of provincial interest.

Section 51, subsection 24 sets out the criteria for which Draft Plans of Subdivision are evaluated to have regard for health, safety, convenience, accessibility for persons with disabilities and the welfare of future and present residents within the municipality.

The following addresses both noted sections of the *Planning Act*, as follows:

The Proposed Development has regard for matters of Provincial Interest per Section 2 of the *Planning Act* including:

(a) the protection of ecological systems, including natural areas, features and functions;

(f) the adequate provision and efficient use of communication, transportation, sewage and water services and waste management systems;

(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;

(i) the adequate provision and distribution of educational, health, social, cultural and recreational facilities;

(j) the adequate provision of a full range of housing, including affordable housing;

(l) the protection of the financial and economic well-being of the Province and its municipalities;

(o) the protection of public health and safety;

(p) the appropriate location of growth and development;

(q) the promotion of development that is designed to be sustainable, to support public transit and to be oriented to pedestrians;

(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 development is appropriately located within an area designated for development, is orderly with appropriate scale of development fitting within the surrounding land use context, and provides for a varied housing type *(e.g., Single Detached Dwellings & Townhouse Dwellings)*.

The proposed dwellings are capable of accommodating accessory or garden suites *(On the Single Detached Lots)* which can assist with affordability of housing.

The proposed development is accessible and a sustainable form of development, in that, the design accommodates pedestrianism, active living with the POPS, and is located in proximity to

recreational services, conservation area *(e.g., Black Creek Conservation Area)* and proximity to Public Service Facilities.

The proposed Draft Plan of Subdivision has regard for required criteria per Section 51 *(24)* of the *Planning Act* including:

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

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

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

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

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

(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;

(f) the dimensions and shapes of the proposed lots;

(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;

(i) the adequacy of utilities and municipal services;

(j) the adequacy of school sites;

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

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

(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).

In review the above noted and applicable criteria, the proposed Draft Plan of Subdivision has regard for matters of Provincial Interest, is not premature, conforms to the Official Plan with available lands to accommodate the proposed development and has been designed in accordance with the requirements of the Act, with adequate access to community services, an available road network, and poses no adverse impacts to natural features.

Provincial Planning Statement 2024:

The Provincial Planning Statement *(PPS 2024)*, issued under Section 3 of the *Planning Act,* outlines matters and policies of Provincial Interest, as they would relate to land use planning and seeks to establish the policy*(s)* foundation for regulations with the goal of enhancing the quality of life for residents of Ontario.

All decisions under the *Planning Act* shall be consistent with the PPS 2024.

The PPS 2024 promotes coordinated land use planning with efficient use of land and development patterns, which will accommodate an appropriate supply and range of residential, employment, institutional and recreational land uses.

In assessing the appropriateness of the proposed development including the proposed Draft Plan of Subdivision and Site Plan, the entirety of the PPS 2024 is relevant. The following specific policies are also relevant in assessing the Proposed Development and consistency with the PPS 2024:

Chapter 2: Building Homes, Sustaining Strong and Competitive Communities

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

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

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

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

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

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

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

The proposed development makes efficient use of lands located within an existing Settlement Area being the Port Dover Urban Area while helping to provide housing options for the County. The proposed housing typologies consisting of Single Detached and Townhouse Dwellings are appropriate when considering the surrounding land use context.

The proposed development also provides for a POPS, which can facilitate recreational and passive activities. The proposed development will be serviced via Municipal Services, from infrastructure installed through prior phases of the Dover Coast development.

Chapter 2.2: Housing

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

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

b) permitting and facilitating:

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

2. 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 proposed development's dwellings can accommodate accessory dwellings or garden suites *(On the Single Detached Lots)*, contributing to housing affordability while ensuring an appropriate land use pattern, in keeping with the surrounding area context, which is reflective of a stable, lifestyle neighbourhood setting along with access to Public Service Facilities. The Subject Lands are already planned for future residential uses, per the County's Official Plan designation and in-effect Zoning, which permits the housing typologies as proposed. The proposed development is efficient and makes use of
vacant lands which will ultimately support active transportation and will result in a net increase in residential units for the community including completion of the Dover Coast Lifestyle Community.

Chapter 2.3: Settlement Areas and Settlement Area Boundary Expansions

2.3.1 General Policies for Settlement Areas

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

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

a) efficiently use land and resources;
b) optimize existing and planned infrastructure and public service facilities;
c) support active transportation;
d) are transit-supportive, as appropriate; and
e) are freight-supportive.

3. Planning authorities shall support general intensification and redevelopment to support the achievement of complete communities, including by planning for a range and mix of housing options and prioritizing planning and investment in the necessary infrastructure and public service facilities.

4. Planning authorities shall establish and implement minimum targets for intensification and redevelopment within built-up areas, based on local conditions.

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

6. Planning authorities should establish and implement phasing policies, where appropriate, to ensure that development within designated growth areas is orderly and aligns with the timely provision of the infrastructure and public service facilities.

The Subject Lands are located within an already established Settlement Area being the Port Dover Urban Area and are sutiable to accommodate new housing through efficient use of vacant lands, optimizing existing and planned infrastrucutre while contributing new infrastructure and facilities including roads, and a POPS.

The proposed development will contriubte to a Complete Community by means of providing a range of housing types including Single Detached and Townhouse Dwellings, capable of also accommodating accessory units and/or garden suites *(On the Single Detched Lots)*.

Chapter 3 being the Infrastructure and Facilities policies, per the PPS 2024 are also relevant, in that, the proposed development is to be serviced by means of Municipal Services. Further, in accordance with the Engineering Memorandums, submitted in support of the proposed development, site servicing including sewage, water and stormwater management services are propsoed in an efficinet manner, and intergration of existing services to accommodate the propsoed development.

The Draft Paln of Subdivision also includes a POPS, connected by two pedestrian pathways.

Per the Policies within Chapter 3.9, of the PPS 2024, healthy, active, and inclusive communities are to be promoted, as follows:

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

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

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

c) providing opportunities for public access to shorelines; and

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

The design of the proposed development ensures the proposed Private Streets with 14 metre widths, the POPS and pedestrial pathways are designed in accordance with County Engineering Design Standards and accessible. The Plan includes an abundance of open space with the POPS, helping to foster interaction between residents, recreation, and ensuring connectivity to the community.

Per Chapter 4.6, as noted, the previous Stage 1 and 2 Archaeological Assesments did not discover any archaeological resources or cultural resoruces on the Subject Lands and therefore, the Propsoed Development does not pose any impact to any cultural heritage and archaeological resource.

Lastly, per Chapter 5, the proposed development does not encroach onto any natural hazards.

Accordingly, the proposed development including the proposed Draft Plan of Subdivision and Site Plan are consistent with the Policies of the PPS 2024, in that, the proposed development is located within a designated growth area, provides for contribution to housing supply, can be accommodated with Municipal Services, creates public spaces including the proposed POPS and does not pose any adverse impacts to the natural environment while be compatible with surrounding land uses.

The proposed Draft Plan of Condominium will establish tenure as a Common Element Condominium which will lessen the burden on public expenditures as the development will be privately maintained.

Based on the aformentioend, the propsoed development of the Subejct Lands including the proposed Plan of Subdivision and Site Plan Control applications are consistent with the Provincial Planning Statement, 2024.

County of Norfolk Official Plan:

As mentioned, the Subject Lands form part of the *Lakeshore Special Policy Area Secondary Plan* and are designated 'Urban Residential' within the Port Dover Urban Area per the *County of Norfolk Official Plan*.

The proposed development being located within an existing Urban Area is supportable in accordance with the Port Dover Urban Area policies, per the Official Plan.

Further, the 'Urban Residential' designation permits urban dwellings including the proposed Single Detached Dwellings and Townhouse Dwellings with the opportunity to include Garden Suites and Home Occupations in accordance with policies 5.3.3.1 and 5.3.3.2 of the Official Plan.

The following, applicable 'Urban Residential' polices have been reviewed to ensure conformity with the same, in evaluating the proposed development:

> *The following policies apply to land designated Urban Residential.*
>
> *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.*
>
> *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;*
>
> *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;*
>
> *iii) the development will be encouraged to have direct access to an arterial or collector road, where possible and appropriate;*
>
> *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;

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

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;

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;

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

ix) triplexes, fourplexes, freehold street townhouses or other similar small-scale 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 policies pertaining to high density residential uses and neighbourhood commercial uses were not evaluated as the proposed development does not include high density or commercial land uses.

In reviewing the above, applicable policies, the proposed development has direct access to Dover Coast Boulevard being a Local Road, which provides access to New Lakeshore Road, connecting the Subject Lands to Highway 6 via Lakeview Avenue. Upon completion of the roundabout at the junction with Highway 6, the proposed development will have direct access to the Highway via Dover Coast Boulevard. Prior to Removal of the Holding Symbol, the completion of Dover Coast Boulevard and the noted, roundabout is required, ensuring the proposed development can be serviced with an adequate road network.

The proposed development has regard and is consistent with surrounding land use with a gross density of approximately 14 units per hectare, consisting of both Single Detached Dwellings and Townhouse Dwellings, which is in keeping within the density range for such housing typologies, per the Official Plan.

Per the Urban Design Brief, the proposed development is well designed, integrated, and will be reviewed through Site Plan Control in accordance with Section 9.6.5 of the Official Plan.

The proposed development includes a POPS which provides for a vista from Dover Coast

Boulevard while being connected to the proposed dwellings via two pedestrian pathways. The POPS will contribute to parkland dedication while also providing for active and passive recreational opportunities, as demonstrated by the following Concept Plan:

Figure 7: Concept Recreation Through the Woods

Source: Malone Given Parsons

Being within the *Lakeshore Special Policy Area Secondary Plan*, the policies of the Plan including the Design Guidelines were reviewed to ensure conformity to the same. The Subject Lands are not part of a neighbourhood planning area and are in proximity to an 'Urban Tourism Node *(Conceptual)*' per Schedule "F" of the Secondary Plan.

The Secondary Plan puts forward a Growth Management Strategy, Design Guidelines, and various policies to ensure safe, sustainable neighbourhoods within the Lakeshore Special Policy Area.

The Subject Lands are within an 'Urban Area' and Section 3.4 policies, therefore, continue to apply. As the Subject Lands are already designated to accommodate future growth and form part

of the 4th Phase of the Dover Coast Lifestyle Community, the proposed development will aid the fulfilment of growth management population forecasts within the need to expand the urban area.

The proposed development respects and reinforces the existing character of the Dover Coast community by means of providing for traditional housing typologies and elevated architectural design, in conformance with the Desing Guidelines, as demonstrated by the Urban Design Brief.

Being a lifestyle community, within Port Dover, the policies within Section 11.3.2.1 *(g)* were reviewed and the proposed development conforms to said policies, in that, the Subject Lands form part of phased development, with no special crop lands, not within primate agricultural lands, no issues arising with Minimum Distance Separation *(MDS)*, will be implemented with appropriate services, and serviced by an appropriate road network. Lastly, the Subject Lands are devoid of any natural features and are vacant, readily available to accommodate additional housing to complete the Dover Coast Lifestyle Community.

Further, a review of the Sustainable Neighborhood Design policies indicates the proposed development conforms with the same, in that, the Plan is compact, walkable with a human scale environment including a substantial and central open space block assisting with the promotion of recreational use for future residents while also providing a view corridor or vistas from Dover Coast Road.

Overarchingly, the proposed development meets the general intent, vision and principles of the Secondary Plan.

Based on review of the applicable Official Plan policies, the proposed development meets the general intent and conforms to the Official Plan.

Norfolk County Zoning By-law No.1-Z-2014, as amended:

As mentioned, the Subject Lands are zoned 'Residential R4-Zone' with a Holding Symbol *(H)* per the County of *Norfolk Zoning By-law No. 1-Z-2014*, as amended and consolidated as of January 1st, 2021.

The proposed dwelling types are permissible in accordance with the 'Residential R4-Zone' and applicable Special Provision No. 14.543, of the Zoning By-law, which permits additional uses including the proposed Single Detached Dwellings.

The Subject Lands have an existing Holding Symbol, which can only be removed once the roundabout is constructed at Dover Coast Boulevard and Highway 6, along with approval of all engineering drawings and clearance of Draft Plan Conditions.

It is therefore anticipated that the Removal of Holding Symbol application will be filed, upon review of the enclosed submission.

The proposed development has been designed in accordance with the Special Provisions, per Section 14.543, of the Zoning By-law, which treats the lands as 'one lot'. The lot*(s)* configuration includes the required exterior yards along Dover Coast Boulevard while also ensuring compliance with the 40% Lot Coverage for all buildings proposed including ensuring the Townhouse Dwellings are no more than 40% of the total lot yield.

Through the technical review process, should any deviations from the Zoning By-law be identified, it is recommended a Minor Variance Application be considered to address the same.

Based on review of the Zoning By-law and notably, Special Provision 14.543, the proposed development conforms to the general intent of the Zoning By-law.

In summation, the proposed development is representative of good land use planning, is consistent with the *Planning Act*, has regard for matters of Provincial Interest, is consistent with the *Provincial Planning Statement (2024)*, conforms to the County of Norfolk Official Plan and meets the general intent of the *Norfolk County Zoning By-law No.1-Z-2014*, as amended.

Submission Items

In support of complete Draft Plan of Subdivision, Draft Plan of Condominium *(Common Element)* and Site Plan Control applications, to implement Phase 4 of the Dover Coast Lifestyle Community, please find enclosed the following Submission Items:

- One *(1)* PDF file of this Cover and Planning Justification Letter, as prepared by the undersigned.
- One *(1)* PDF file of a fully completed, executed, and commissioned Planning Application Form, as prepared by the undersigned.
- One *(1)* PDF file of a Parcel Register as issued by Service Ontario.
- One *(1)* PDF file of a Draft Plan of Subdivision, as prepared by the undersigned.
- One *(1)* PDF file of a Draft M-Plan, as prepared by Jewitt and Dixon Ontario Land Surveyors.
- One *(1)* PDF file of a proposed Draft Plan of Condominium *(Common Element)*, as prepared by Jewitt and Dixon Ontario Land Surveyors.

- One *(1)* PDF file of a Concept Site Plan, as prepared by the undersigned.
- One *(1)* PDF file of a Park Landscape Concept Plan, as prepared by Malone, Given, Parsons.
- One *(1)* PDF file of a Civil Engineering Plans inclusive of a Parking Plan, as prepared by Development Engineering *(London)* Ltd.
- One *(1)* PDF file of a Sanitary Servicing Memorandum, as prepared by Development Engineering *(London)* Ltd.
- One *(1)* PDF file of a Stormwater Management Memorandum, as prepared by Development Engineering *(London)* Ltd.
- One *(1)* PDF file of a Water Servicing Memorandum, as prepared by Development Engineering *(London)* Ltd.
- One *(1)* PDF file of Street Lighting Plans, as prepared by ERTH Holdings Inc.
- One *(1)* PDF file of a Stage 1 & 2 Archaeological Assessment, as prepared by Mayer Heritage Consultants Inc.
- One *(1)* PDF file of a Stage 1 & 2 Archaeological Assessment pertaining to the Highway 6 Roundabout, as prepared by Archaeological Services Inc.
- One *(1)* PDF file of a Stage 1 & 2 Archaeological Assessment pertaining to the Highway 6 Roundabout Acknowledgement Letter dated June 10th, 2021, as issued by the Ministry of Citizenship and Multiculturalism.
- One *(1)* PDF file of an Urban Seign Brief, as prepared by Malone, Given, Parsons.

End of Submission Items.

The required application*(s)* fees will be provided under separate cover once confirmed, by the County

Your attention regarding the prompt circulation and review of the enclosed applications is great appreciated.

Should you have any questions or require further information, please do not hesitate to contact the undersigned.

Yours truly,

BLACKTHORN DEVELOPMENT CORP.

Maurizio Rogato, B.U.R.Pl., M.C.I.P., R.P.P.
Principal

Copy: Client

PLAN 37M – _____

CERTIFICATE OF REGISTRATION

I CERTIFY THAT THIS PLAN IS REGISTERED IN THE LAND REGISTRY OFFICE FOR THE LAND TITLES DIVISION OF NORFOLK (37) AT O'CLOCK ON THE DAY OF , 2025
AND ENTERED IN THE PARCEL REGISTER(S) FOR ALL OF PIN 50256 – 1045 (LT)
AND THE REQUIRED CONSENTS ARE REGISTERED AS PLAN DOCUMENT NO.

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

THIS PLAN COMPRISES ALL OF PIN 50256 – 1045 (LT)

BLOCK 1 IS SUBJECT TO AN EASEMENT AS SET OUT IN INSTRUMENT No. NK48280

APPROVED UNDER SECTION 51 (58)
OF THE PLANNING ACT, R.S.O. 1990
ON THIS DAY OF , 2025.

Al Meneses
Chief Administrative Officer
Norfolk County

PLAN OF SUBDIVISION
OF PART OF
LOT 15
CONCESSION 1
IN THE GEOGRAPHIC
TOWNSHIP OF WOODHOUSE
IN
NORFOLK COUNTY

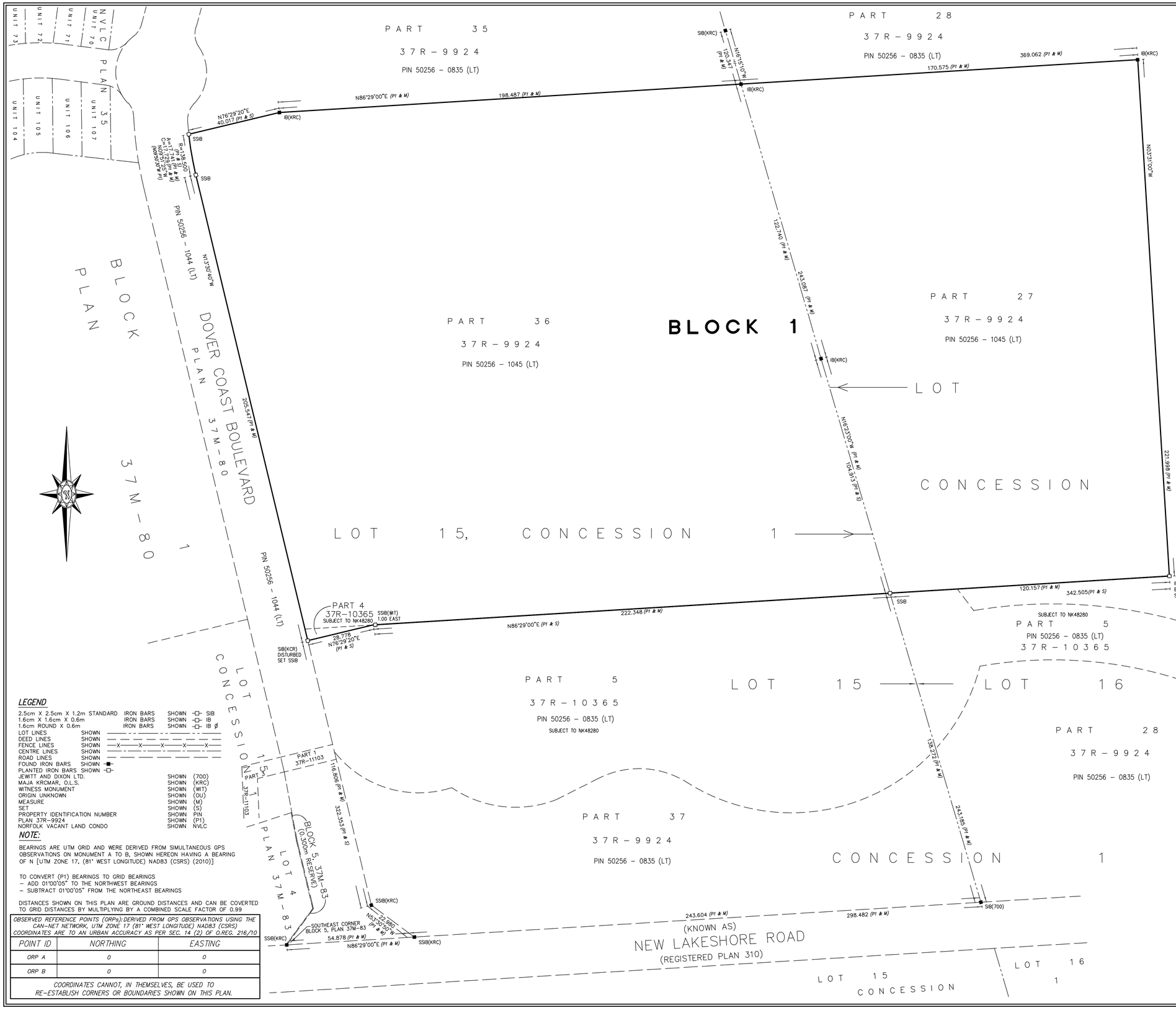
SCALE: 1 : 750

7.5 0 30 METRES

JEWITT AND DIXON LTD.

METRIC NOTE:

DISTANCES AND COORDINATES ARE METRIC AND CAN BE CONVERTED TO IMPERIAL BY DIVIDING BY 0.3048



LEGEND

2.5cm X 2.5cm X 1.2m STANDARD	IRON BARS	SHOWN	SIB
1.6cm X 1.6cm X 0.6m	IRON BARS	SHOWN	IB
1.6cm ROUND X 0.6m	IRON BARS	SHOWN	IB Ø
LOT LINES		SHOWN	
DEED LINES		SHOWN	
FENCE LINES		SHOWN	
CENTRE LINES		SHOWN	
ROAD LINES		SHOWN	
FOUND IRON BARS		SHOWN	
PLANTED IRON BARS		SHOWN	
JEWITT AND DIXON LTD.		SHOWN	(700)
MAJA KRCMAR, O.L.S.		SHOWN	(KRC)
WITNESS MONUMENT		SHOWN	(WIT)
ORIGIN UNKNOWN		SHOWN	(OU)
MEASURE		SHOWN	(M)
SET		SHOWN	(S)
PROPERTY IDENTIFICATION NUMBER		SHOWN	PIN
PLAN 37R–9924		SHOWN	(P1)
NORFOLK VACANT LAND CONDO		SHOWN	NVLC

NOTE:

BEARINGS ARE UTM GRID AND WERE DERIVED FROM SIMULTANEOUS GPS OBSERVATIONS ON MONUMENT A TO B, SHOWN HEREON HAVING A BEARING OF N [UTM ZONE 17, (81° WEST LONGITUDE) NAD83 (CSRS) (2010)]

TO CONVERT (P1) BEARINGS TO GRID BEARINGS
– ADD 01°00'05" TO THE NORTHWEST BEARINGS
– SUBTRACT 01°00'05" FROM THE NORTHEAST BEARINGS

DISTANCES SHOWN ON THIS PLAN ARE GROUND DISTANCES AND CAN BE COVERTED TO GRID DISTANCES BY MULTIPLYING BY A COMBINED SCALE FACTOR OF 0.99

OBSERVED REFERENCE POINTS (ORPs):DERIVED FROM GPS OBSERVATIONS USING THE CAN–NET NETWORK, UTM ZONE 17 (81° WEST LONGITUDE) NAD83 (CSRS)
COORDINATES ARE TO AN URBAN ACCURACY AS PER SEC. 14 (2) OF O.REG. 216/10

POINT ID	NORTHING	EASTING
ORP A	0	0
ORP B	0	0

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

OWNER'S CERTIFICATE

THIS IS TO CERTIFY THAT:

1. BLOCK 1 HAS BEEN LAID OUT IN ACCORDANCE WITH OUR INSTRUCTIONS.

DATED: _____

DAVID HILL, PRESIDENT
BALLANTRY (DOVER COAST) INC.
I HAVE THE AUTHORITY TO BIND THE CORPORATION

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT THE SURVEYORS ACT, AND THE LAND TITLES ACT, AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON THE 16TH DAY OF JULY, 2025.

DATED: AUGUST 12, 2025

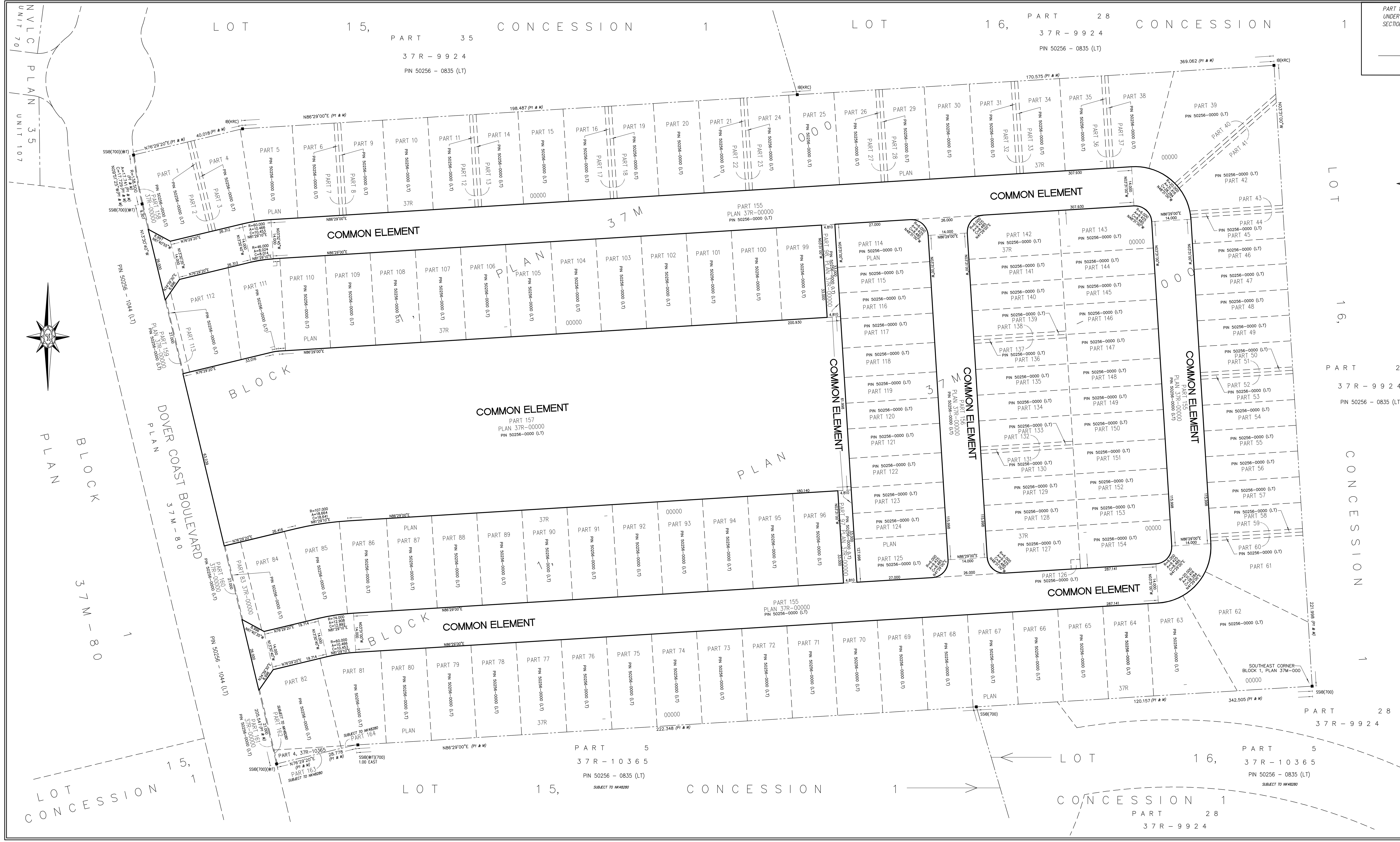
R. C. DIXON
ONTARIO LAND SURVEYOR

THIS PLAN OF SURVEY RELATES TO AOLS PLAN SUBMISSION FORM NUMBER V–105997

SUBDIVISION NAME

JEWITT AND DIXON ONTARIO LAND SURVEYORS
A Division of Kim Husted Surveying Ltd.
SURVEYING MAPPING GIS
650 Ireland Rd., Simcoe, ON N3Y 4K2
T: (519) 426-0842 www.jdbarnes.com

DRAWN BY:	CHECKED BY:	REFERENCE NO.:
J.L.M.	K.H.	25–54–309–00
		DATED: AUGUST 13, 2025



PART 1 APPROVED AND PARTS 2, 3 & 4 EXEMPTED UNDER SECTION 50 OF THE CONDOMINIUM ACT AND SECTION 51 OF THE PLANNING ACT THIS DAY OF , 2025.

Al Meneses
Chief Administrative Officer
Norfolk County

PART 1 OF 4 PARTS
SHEET 1 OF 1 SHEET

NORFOLK COMMON ELEMENT CONDOMINIUM PLAN No.

LEVEL 1
UNIT 1

REGISTERED IN THE LAND REGISTRY OFFICE FOR THE LAND TITLES DIVISION OF NORFOLK (37) AT O'CLOCK ON THE DAY OF 2025

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

PLAN OF SURVEY
OF PART OF
BLOCK 1
PLAN 37M-000
IN THE GEOGRAPHIC
TOWNSHIP OF WOODHOUSE
IN
NORFOLK COUNTY
SCALE: 1 : 500

5 0 20 METRES

JEWITT AND DIXON LTD.

METRIC NOTE:
DISTANCES AND COORDINATES ARE METRIC AND CAN BE CONVERTED TO IMPERIAL BY DIVIDING BY 0.3048

SURVEYOR'S CERTIFICATE
I CERTIFY THAT

(1) – THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYOR'S ACT, THE CONDOMINIUM ACT, (1998) AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.

(2) – THIS SURVEY WAS COMPLETED ON THE

(3) – THE DIAGRAMS OF THE UNITS SHOWN ON THIS PLAN ARE SUBSTANTIALLY ACCURATE

DATE

R. C. DIXON
ONTARIO LAND SURVEYOR

THIS PLAN OF SURVEY RELATES TO AOLS PLAN SUBMISSION FORM NUMBER V-105997

DECLARATION REGISTERED AS No. NK

THIS PLAN COMPRISES ALL OF P.I.N. 50256-0000

SCHEDULE OF APPURTENANT AND SERVIENT INTERESTS
(PURSUANT TO SECTION 4 (1) (F) OF THE CONDOMINIUM ACT

	PART LOT/ BLOCK	PLAN/ CONCESSION	DESCRIBED IN	NOTES
SUBJECT TO (SERVIENT INTERESTS)	-	-	-	-
SUBJECT TO (SERVIENT INTERESTS)	-	-	-	-
SUBJECT TO (SERVIENT INTERESTS)	-	-	-	-
TOGETHER WITH (APPURTENENT INTERESTS)	-	-	-	-
TOGETHER WITH (APPURTENENT INTERESTS)	-	-	-	-
TOGETHER WITH (APPURTENENT INTERESTS)	-	-	-	-
TOGETHER WITH (APPURTENENT INTERESTS)	-	-	-	-

DOVER COAST PHASE 4

CERTIFICATE OF DECLARANT
THIS IS TO CERTIFY THAT THE PROPERTY INCLUDED IN THIS PLAN HAS BEEN LAID OUT INTO UNITS AND COMMON ELEMENTS IN ACCORDANCE WITH OUR INSTRUCTIONS DATED AT THE ________ OF ______________.

DATE

DAVID HILL, PRESIDENT
BALLANTRY (DOVER COAST) INC.
I HAVE THE AUTHORITY TO BIND THE CORPORATION

NOTES
MONUMENTS SET ON ALL UNIT CORNERS ARE IB'S UNLESS OTHERWISE NOTED

BEARINGS ARE UTM GRID AND WERE DERIVED FROM SIMULTANEOUS GPS OBSERVATIONS ON MONUMENT A TO B, SHOWN HEREON HAVING A BEARING OF N29°48'40"W
[UTM ZONE 17, (81° WEST LONGITUDE) NAD83 (CSRS) (2010)]

TO CONVERT PLAN 37R-10170 BEARINGS TO GRID BEARINGS
– ADD 00°20'30" TO THE NORTHWEST BEARINGS
– SUBTRACT 00°20'30" FROM THE NORTHEAST BEARINGS

DISTANCES SHOWN ON THIS PLAN ARE GROUND DISTANCES AND CAN BE CONVERTED TO GRID DISTANCES BY MULTIPLYING BY A COMBINED SCALE FACTOR OF 0.999625

LEGEND

2.5cm X 2.5cm X 1.2m STANDARD IRON BARS	SHOWN	SIB
1.6cm X 1.6cm X 0.6m IRON BARS	SHOWN	IB
1.6cm ROUND X 0.6m IRON BARS	SHOWN	IB Ø
LOT LINES	SHOWN	
DEED LINES	SHOWN	
FENCE LINES	SHOWN	—X—X—X—X—X—
CENTRE LINES	SHOWN	
ROAD LINES	SHOWN	
FOUND IRON BARS	SHOWN	■
PLANTED IRON BARS	SHOWN	□
JEWITT AND DIXON LTD.	SHOWN	(700)
MAJA KRCMAR, O.L.S.	SHOWN	(KRC)
WITNESS MONUMENT	SHOWN	(WIT)
ORIGIN UNKNOWN	SHOWN	(OU)
MEASURE	SHOWN	(M)
SET	SHOWN	(S)
PROPERTY IDENTIFICATION NUMBER	SHOWN	PIN
PLAN 37R-9924	SHOWN	(P1)

BEARING NOTE
BEARINGS ARE UTM GRID AND WERE DERIVED FROM SIMULTANEOUS GPS OBSERVATIONS ON MONUMENT A TO B, SHOWN HEREON HAVING A BEARING OF N
[UTM ZONE 17, (81° WEST LONGITUDE) NAD83 (CSRS) (2010)]

TO CONVERT (P1) BEARINGS TO GRID BEARINGS
– ADD 01°00'05" TO THE NORTHWEST BEARINGS
– SUBTRACT 01°00'05" FROM THE NORTHEAST BEARINGS

DISTANCES SHOWN ON THIS PLAN ARE GROUND DISTANCES AND CAN BE COVERTED TO GRID DISTANCES BY MULTIPLYING BY A COMBINED SCALE FACTOR OF 0.99

OBSERVED REFERENCE POINTS (ORPs): DERIVED FROM GPS OBSERVATIONS USING THE CAN-NET NETWORK, UTM ZONE 17 (81° WEST LONGITUDE) NAD83 (CSRS) COORDINATES ARE TO AN URBAN ACCURACY AS PER SEC. 14 (2) OF O.REG. 216/10

POINT ID	NORTHING	EASTING
ORP A	0	0
ORP B	0	0

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

INDEX OF PARTS
PART 1
SHEET 1 – PLAN OF SURVEY OF THE CONDOMINIUM PROPERTY, THE ILLUSTRATION OF THE APPURTENT AND SEVIENT INTERESTS AND THE DESIGNATION OF THE UNITS ON LEVEL 1
PART 2
NIL – EXCLUSIVE USE
PART 3
NIL – ARCHITECTURAL PLANS
PART 4
NIL – STRUCTURAL PLANS

UNIT BOUNDARY DEFINITION
—— DENOTES UNIT BOUNDARIES AND BOUNDARY OF COMMON ELEMENT

THE MONUMENTS CONTROLLING THE EXTENT AND LOCATION OF UNITS ARE BOUND BY THE AREAS SHOWN ON PART 1, SHEET 1 OF THE DESCRIPTION AND MORE PARTICULARLY DESCRIBED IN SCHEDULE C OF THE DECLARATION AREAS NOT DESIGNATED AS UNITS ARE COMMON ELEMENTS AND LABELLED AS SUCH

JEWITT AND DIXON
ONTARIO LAND SURVEYORS
A Division of Kim Husted Surveying Ltd.
SURVEYING MAPPING GIS
650 Ireland Rd., Simcoe, ON N3Y 4K2
T: (519) 426-0842 www.jdbarnes.com

DRAWN BY:	CHECKED BY:	REFERENCE NO.:
J.L.M.	K.H.	25-54-309-00
		DATED: AUGUST 12, 2025

FUTURE DEVELOPMENT

BLOCK 1

OPEN SPACE

FUTURE DEVELOPMENT

FUTURE DEVELOPMENT

DOVER COAST BOULEVARD

DOVER COAST BOULEVARD

SUBJECT TO EASEMENT AS IN INST. NK98828 AND SUBJECT TO EASEMENT IN GROSS AS IN INST. NK102873

SUBJECT TO EASEMENT AS IN INST. NK102873 AND SUBJECT TO EASEMENT IN GROSS AS IN INST. NK98828

SUBJECT TO EASEMENT AS IN INST. NK102873 AND SUBJECT TO EASEMENT IN GROSS AS IN INST. NK98828

SUBJECT TO EASEMENT AS IN INST. NK102873 AND SUBJECT TO EASEMENT IN GROSS AS IN INST. NK98828

SOUTHEAST CORNER OF BLOCK 2, PLAN 37M-80

PART 36

PART 37

PART 27

PART 25

PART 5

CONCESSION 1

LEGEND

Subject Boundary

AREA STATISTICS

Block 1 _____ 8.68 ha

NOTES:
All measurements are in meters.

SURVEYOR'S CERTIFICATE

I hereby certify that the boundaries of the land to be subdivided as shown on this plan, and their relationship to the adjacent lands are accurately and correctly shown.

Richard Dixon, O.L.S. — Signature — 15 / 9 / 2025 (Day / Month / Year)
Jewitt and Dixson LTD. a division of J.D. Barnes Ltd.

OWNERS AUTHORIZATION

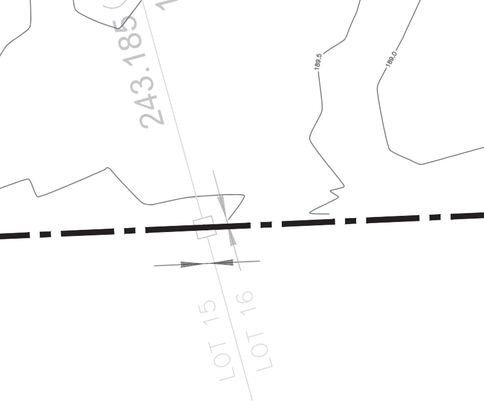
We, Ballantry (Dover Coast) Inc. owner, hereby authorize BLACKTHORN DEVELOPMENT CORP. to prepare and submit a draft plan of subdivision for approval.

David Hill — Signature — 29 / 09 / 2025 (Day / Month / Year)
Mr. David Hill, President
Ballantry (Dover Coast) Inc.

KEY PLAN

Subject Boundary

Metric Scale
0 200 400



0 15 30 45 60
metric scale

DRAFT OF SUBDIVISION

Part of Lot 15 and 16, Concession 1
(Geographic Township of Woodhouse)
Norfolk County

Dover Coast Blvd.

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

A. The boundaries of the land proposed to be subdivided, certified by an Ontario land surveyor;
D. The purpose for which the proposed lots are to be used;
E. The existing uses of all adjoining lands;
F. The approximate dimensions and layout of the proposed lots;
H. The availability and nature of domestic water supplies;
J. Existing contours or elevations as may be required to determine the grade of the highways and the drainage of the land proposed to be subdivided;
K. The municipal services available or to be available to the land proposed to be subdivided;
L. The nature and extent of any restrictions affecting the land proposed to be subdivided, including restrictive covenants or easements.

BLACKTHORN Development Corp.

Land Development | Land Use Planning | Project Management | Government Relations

1:800	September 15, 2025	2445-24		JD
Scale	Date	Drawing Number	Rev.	Drawn

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

PROPERTY DESCRIPTION: PT LOTS 15 & 16, CON 1 WOODHOUSE BEING PTS 27 & 36, PL 37R9924;; TOGETHER WITH AN EASEMENT OVER PT LTS 14 & 15 CON 1, PTS 7 & 9 37R9924 AS IN NK48280; TOGETHER WITH AN EASEMENT OVER PT LT 15 CON 1, PT 9 37R9924 AS IN NK48280; SUBJECT TO AN EASEMENT OVER PART 4, 37R10365 IN FAVOUR OF PART LOTS 14 AND 15, CONCESSION 1, PARTS 6-16 &41 37R9924 AS IN NK48280; NORFOLK COUNTY

PROPERTY REMARKS: PLANNING ACT CONSENTS IN NK17015.

ESTATE/QUALIFIER:	RECENTLY:	PIN CREATION DATE:
FEE SIMPLE ABSOLUTE	DIVISION FROM 50256-0848	2017/05/09

OWNERS' NAMES	CAPACITY	SHARE
BALLANTRY (DOVER COAST) INC.		

REG. NUM.	DATE	INSTRUMENT TYPE	AMOUNT	PARTIES FROM	PARTIES TO	CERT/ CHKD
*** PRINTOUT INCLUDES ALL DOCUMENT TYPES (DELETED INSTRUMENTS NOT INCLUDED) **						
37R9594	2006/11/28	PLAN REFERENCE				C
NK126	2006/12/18	APL ABSOLUTE TITLE		PORT DOVER FARMS INC.	PORT DOVER FARMS INC.	C
	REMARKS: NOTICE 604113; PART 1 ON 37R-9594					
37R9924	2008/10/15	PLAN REFERENCE				C
NK92010	2016/08/17	NOTICE	$2	NORFOLK VACANT LAND CONDOMINIUM CORPORATION NO. 28		C
NK148919	2021/12/24	CHARGE	$12,000,000	2079095 ONTARIO LTD.	FIRST SOURCE FINANCIAL MANAGEMENT INC.	C
NK148920	2021/12/24	NO ASSGN RENT GEN		2079095 ONTARIO LTD.	FIRST SOURCE FINANCIAL MANAGEMENT INC.	C
	REMARKS: NK148919.					
NK148922	2021/12/24	POSTPONEMENT		MORRISON FINANCIAL MORTGAGE CORPORATION	FIRST SOURCE FINANCIAL MANAGEMENT INC.	C
	REMARKS: NK140980 TO NK148919					
NK176410	2024/11/12	TRANSFER		BALLANTRY (ERIE) INC. 2079095 ONTARIO LTD.	BALLANTRY (DOVER COAST) INC.	C
NK176411	2024/11/12	CHARGE	$15,600,000	BALLANTRY (DOVER COAST) INC.	CAMERON STEPHENS MORTGAGE CAPITAL LTD.	C
NK176412	2024/11/12	NOTICE	$2	BALLANTRY (DOVER COAST) INC.	FIRST SOURCE FINANCIAL MANAGEMENT INC.	C
NK176413	2024/11/12	CHARGE	$4,873,000	BALLANTRY (DOVER COAST) INC.	2079095 ONTARIO LTD.	C
NK176432	2024/11/12	POSTPONEMENT		FIRST SOURCE FINANCIAL MANAGEMENT INC.	CAMERON STEPHENS MORTGAGE CAPITAL LTD.	C
	REMARKS: NK148919 TO NK176411					
NK176433	2024/11/12	TRANSFER OF CHARGE		2079095 ONTARIO LTD.	MORRISON FINANCIAL MORTGAGE CORPORATION OLYMPIA TRUST COMPANY	C

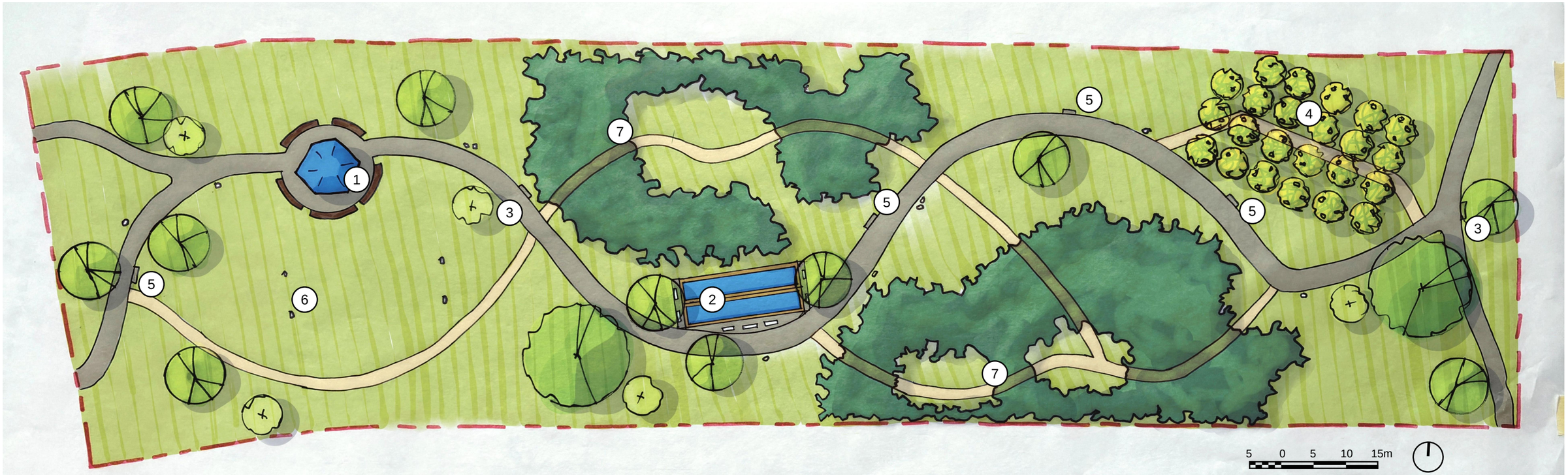
NOTE: ADJOINING PROPERTIES SHOULD BE INVESTIGATED TO ASCERTAIN DESCRIPTIVE INCONSISTENCIES, IF ANY, WITH DESCRIPTION REPRESENTED FOR THIS PROPERTY.
NOTE: ENSURE THAT YOUR PRINTOUT STATES THE TOTAL NUMBER OF PAGES AND THAT YOU HAVE PICKED THEM ALL UP.

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

REG. NUM.	DATE	INSTRUMENT TYPE	AMOUNT	PARTIES FROM	PARTIES TO	CERT/ CHKD
	REMARKS: NK176413.					
NK184349	2025/10/02	LR'S ORDER		LAND REGISTRAR, NORFOLK LAND REGISTRY OFFICE		C
	REMARKS: AMENDS DESCRIPTION					

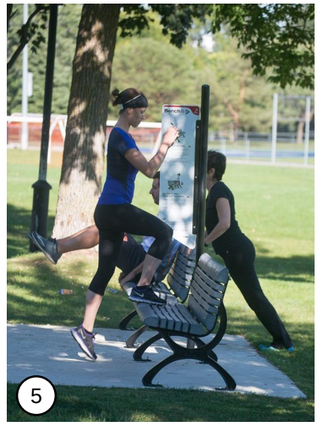
NOTE: ADJOINING PROPERTIES SHOULD BE INVESTIGATED TO ASCERTAIN DESCRIPTIVE INCONSISTENCIES, IF ANY, WITH DESCRIPTION REPRESENTED FOR THIS PROPERTY.
NOTE: ENSURE THAT YOUR PRINTOUT STATES THE TOTAL NUMBER OF PAGES AND THAT YOU HAVE PICKED THEM ALL UP.

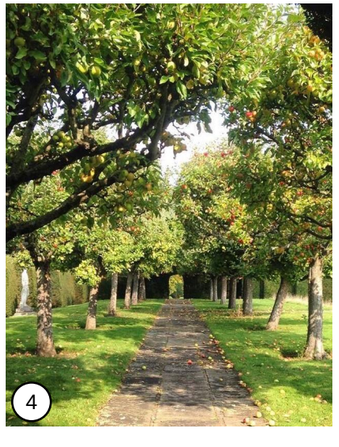
Final Concept : Recreation Through the Woods



Design Features:

1. Welcome Pavilion / Shade Structure with game tables and annual beds for community use
2. Seasonal Bocce Ball court with seating
3. Walking trails with seating
4. Fruit Orchard
5. Adult exercise workout circuit
6. Boulders for Informal Play
7. Accessible "Woodland" trails, with adjacent natural decorative elements (e.g. logs, boulders)





development engineering (London) Limited

CONSULTING CIVIL ENGINEERS

Technical Memorandum

Date: July 18, 2025

To: Sewer Engineering Division, Norfolk County

Subject: **Sanitary Servicing Letter to Address Phase 4 of Dover Coast Subdivision**
DevEng Project Number: DEL13-124P4

Introduction

Development Engineering (London) Limited [DevEng] has been retained by Ballantry Homes to prepare detailed engineering design for the Phase 4 development of Dover Coast Subdivision in Port Dover, Ontario. The current Concept Plan (by Blackthorn Development Corp., ref. to Appendix A) proposes 73 single-family lots and 48 medium-density units.

This technical memorandum has been prepared to summarize the site-level sanitary servicing design in support of detailed design and Site Plan Approval of Phase 4 of Dover Coast Subdivision.

Sanitary Servicing

Existing Infrastructure

There is an existing municipal sanitary sewer within the road allowance of Dover Coast Boulevard. The existing 250 mm sewer was designed and constructed as part of Municipal works for Dover Coast Subdivision, refer to the 'As Constructed' drawing M17 by DevEng in Appendix A. Two 200 mm sanitary stubs were provided during the construction and are located at the proposed intersection of Street A and at the proposed intersection at Street D.

As outlined in the Dover Coast – Municipal Works Master Sanitary Design Sheet (M10; by DevEng dated June 20, 2017) the allocated population for the subject site is 372 people (Area A8). Refer to Appendix A for the sanitary design sheet.

Proposed Infrastructure

Sewers within the proposed development will consist of 200 mm diameter PVC gravity sewers. The sewer sizing and grades have been designed in accordance with Section 9 of the Norfolk County's Design Criteria, as well as from Norfolk County's changes to Development Standards/Guidelines (dated November 28, 2024; ref. to correspondence in Appendix A). The sanitary sewers from the proposed development will connect to the existing Municipal sanitary sewer on Dover Coast Boulevard at the two sanitary stubs previously mentioned.

As outlined in the proposed design sheet for the Phase 4 development (Appendix B), the proposed population for the subject site is now 334 people.

Conclusion

The sanitary gravity sewer is proposed with adequate capacity to support the Phase 4 development and as the proposed population is less than the allocated population, we are of the opinion that the proposed and existing sanitary servicing is sufficient to support the proposed development while meeting all necessary municipal requirements and recommendations.

We trust this letter and supporting appended documents address the sanitary servicing design requirements to support the Site Plan Approval and proposed detailed design for the Phase 4 development of Dover Coast Subdivision. If there are any questions, comments, or concerns, please do not hesitate to contact our firm.

Troy Winger, E.I.T.
Designer

Derek Hoevenaars, P.Eng.
Senior Project Engineer

Submitted by:
Development Engineering (London) Limited

On Behalf of:
Ballantry Homes

Appendix A: Background Information

LEGEND

- Subject Boundary
- Townhouse Units

AREA STATISTICS

Residential Single Detached (16.15m Lots)		4.21 ha
Townhouse Units (9.20m Lots - Blocks 4-14)		1.64 ha
Park (Block 2)		1.44 ha
Path (Block 1, 3)		0.03 ha
R.O.W. (Street A - Street D)		1.36 ha
Gross Area:		8.68 ha

UNIT COUNT

Residential Single Detached (16.15m Lots)	73
Townhouse Units (9.20m Lots - Blocks 4-14)	48
Total Lots	121

NOTES:
All measurements are in meters.

SURVEYOR'S CERTIFICATE

I hereby certify that the boundaries of the land to be subdivided as shown on this plan, and their relationship to the adjacent lands are accurately and correctly shown.

Waldemar Golinski O.L.S. Signature Day Month Year

OWNERS AUTHORIZATION

We, 2079095 Ontario Ltd. (Dover Coast) owner, hereby authorize BLACKTHORN DEVELOPMENT CORP. to prepare and submit a draft plan of subdivision for approval.

John Lennox
Dover Coast
Signature Day Month Year

KEY PLAN

Subject Boundary

Metric Scale
0 500 1000

0 15 30 45 60
metric scale

DRAFT OF SUBDIVISION OPTION 1

Part of Lot 15 and 16, Concession 1
(Geographic Township of Woodhouse)
Norfolk County

Dover Coast Blvd.

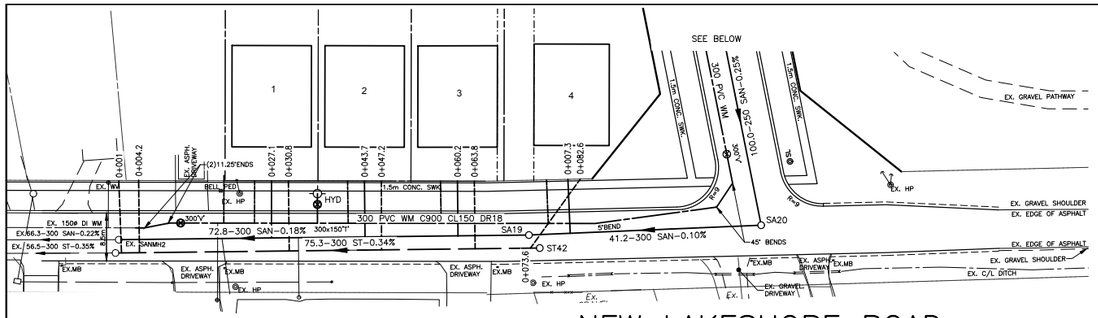
ADDITIONAL INFORMATION REQUIRED UNDER THE PLANNING ACT - SECTION 51 (17)

A. The boundaries of the land proposed to be subdivided, certified by an Ontario land surveyor;
D. The purpose for which the proposed lots are to be used; Residential Single Family and Townhomes.
E. The existing uses of all adjoining lands;
H. The availability and nature of domestic water supplies;
J. Existing contours or elevations as may be required to determine the grade of the highways and the drainage of the land proposed to be subdivided;
K. The municipal services available or to be available to the land proposed to be subdivided;

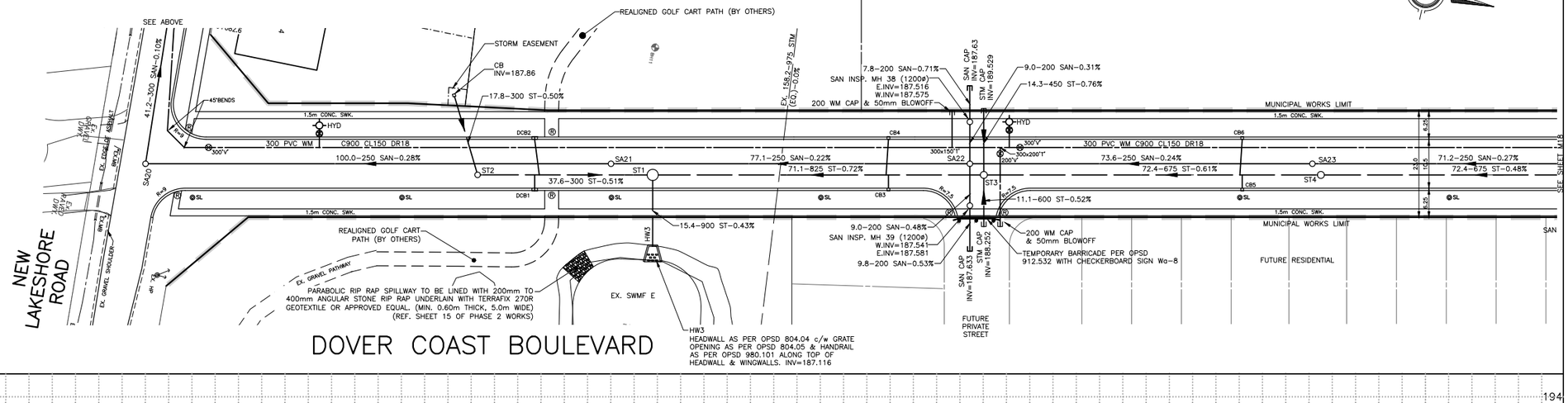
BLACKTHORN Development Corp.

Land Development | Land Use Planning | Project Management | Government Relations

1:800	March 25, 2025	2445-21		JD
Scale	Date	Drawing Number	Rev.	Drawn



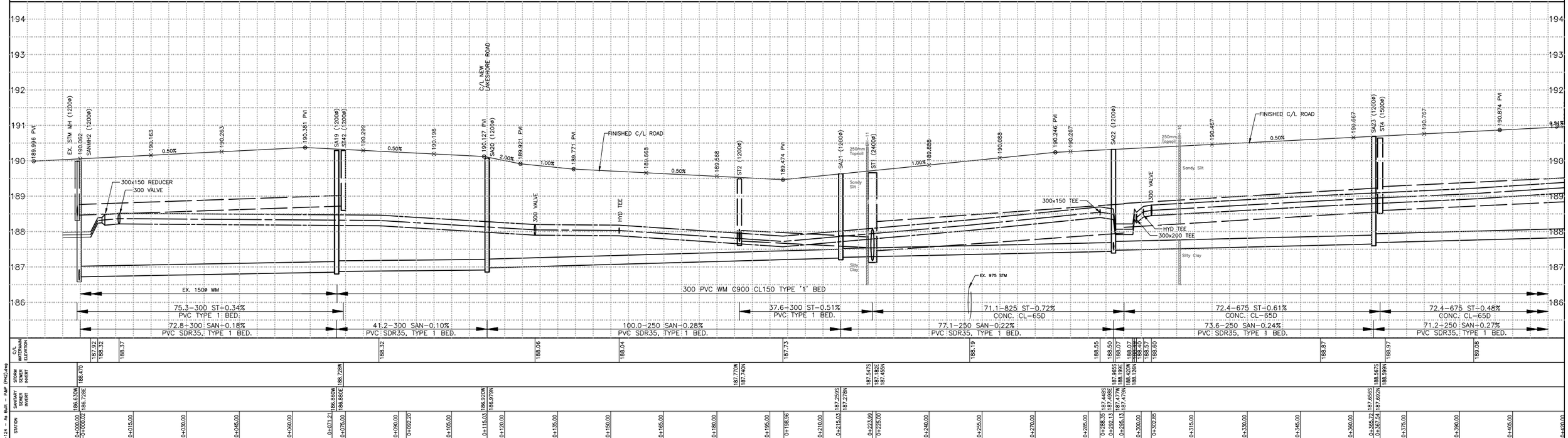
NEW LAKESHORE ROAD



DOVER COAST BOULEVARD

DENOTES 300x300 "T", 150 GATE VALVE & 3-WAY HYDRANT WITH STORZ CONNECTION

MUNICIPAL ROAD 'A' CURB AND GUTTER – OPSD 600.040
NEW LAKESHORE ROAD CURB AND GUTTER – OPSD 600.100



EXISTING SERVICES	DRAWING #, SOURCE	DATE

AS CONSTRUCTED SERVICES	COMPLETION
SANITARY SEWERS, MHs & PDCs	JUNE 2016
STORM SEWERS, MHs, CBs & PDCs	JUNE 2016
WATERMAIN & WSCs	JUL. 2016
GRANULAR BASE	AUG. 2016
CURB & GUTTER	AUG. 2016
SIDEWALK	
PAVING – BASE	SEPT. 2016
PAVING – SURFACE	

DETAILS	CONSULTANT
DESIGN BY JR	DE(L)L
DRAWN BY JR	DE(L)L
CHECKED BY JF	DE(L)L
F.BK. 1054	DE(L)L

No.	REVISIONS	DATE	CONSULTANT
1	FIRST SUBMISSION TO COUNTY	MARCH 06/15	DE(L)L
2	SECOND SUBMISSION TO COUNTY	OCT. 29/15	DE(L)L
3	REVISED PER COUNTY COMMENTS	JUNE 01/16	DE(L)L
4	AS CONSTRUCTED	OCT. 2016	DE(L)L

FILE: DEL13-124 – AS BUILT – P&P (PH2).DWG

CONSULTANT OR DIVISION

Consulting Civil Engineers
41 Adelaide St. N., Unit 71
London, Ontario N6B 3P4
Phone (519) 672-8310
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development engineering (London) Limited
CONSULTING CIVIL ENGINEERS

ENGINEER'S STAMP

Norfolk COUNTY

SCALE
HORIZONTAL – 1:500
5 0 10m
VERTICAL – 1:50
0.5 0 1m

TITLE
DOVER COAST – MUNICIPAL WORKS
PORT DOVER, ONTARIO

NEW LAKESHORE ROAD & DOVER COAST BOULEVARD
STA. 0+000 TO STA. 0+420

PROJECT No. DEL13-124
SHEET No. M17
PLAN FILE No.

DEL13-124 – As Built – P&P (Ph2).dwg
jsountsos Oct/14/16-9:52am

THE FOLLOWING POPULATION ALLOWANCES HAVE BEEN USED TO DESIGN THE SANITARY SEWERS:

RESIDENTIAL (EXISTING TOWN) =2.75 PEOPLE / UNIT
RESIDENTIAL (UNCERTAIN DEVELOPMENT) = 30 UNITS / HECTARE @ 2.75 PEOPLE / UNIT
RESIDENTIAL (DOVER COAST) = 1.8 PEOPLE / UNIT (SOUTH OF HWY. 6)
RESIDENTIAL (DOVER COAST) = 2.75 PEOPLE / UNIT (NORTH OF HWY. 6)
COMMERCIAL = 90 PEOPLE / HECTARE
PER CAPITA DESIGN SEWAGE (L / PERSON / DAY) = **300**

SANITARY SEWER DESIGN SHEET
NORFOLK COUNTY

DESIGN CRITERIA

SEWAGE = $\frac{300 \times M \times P/1000}{86,400}$

INFILTRATION (DOVER COAST) = **0.13 L/s/ha**
INFILTRATION (EXISTING) = **0.28 L/s/ha**

PEAKING FACTOR (M) $= 1 + \frac{14}{4 + \sqrt{P}}$

DATE: 42278.00
DESIGNED B: JR/LM
CHECKED BY: LM/JF

PROJECT FILE NO. DEL13-124

PROJECT NAME: DOVER COAST DEVELOPMENT
ULTIMATE BUILD OUT

LOCATION				AREA			POPULATION						SEWAGE FLOWS				SEWER DESIGN						PROFILE		
AREA No.	STREET	FROM MANHOLE	TO MANHOLE	NET OR GROSS	HECTARES	TOTAL HECTARES	PER HECTARE	PER LOT	NO. OF LOTS	DELTA POP.	TOTAL POP.	PEAKING FACTOR	INFILT L / s	SEWAGE L / s	Q TOTAL L / s	n	PIPE SIZE mm	SLOPE %	CAP L / s	VELOCITY m / s	LENGTH m	FALL IN SEWER	DROP IN MANHOLE	INVERT ELEVATION U.S.	INVERT ELEVATION D.S.
DOVER COAST - NORTH																									
F1	FUTURE				30.100	30.100	30	2.75		2483	2483	3.51	3.91	30.27	34.18	0.013	300	0.3	52.96	0.81					
F2	FUTURE				5.171	5.171	30	2.75		427	427	4.01	0.67	5.94	6.61	0.013	300	0.3	52.96	0.52					
F3	FUTURE				35.869	71.140	30	2.75		2959	5869	3.18	9.25	64.80	74.05	0.013	375	0.3	96.03	0.96					
DOVER COAST - SOUTH																									
A1 (HOTEL/COMM.)	DOVER COAST BLVD.			N	2.210	2.210	120	(Rooms)		200	200	3.32	0.29	2.30	2.59	0.013	200	0.40	20.74	0.45					
A2 (COMMERCIAL)	DOVER COAST BLVD.			N	2.681	4.891	100,000	(Sq.Ft)		241	441	3.20	0.64	4.91	5.54	0.013	200	0.40	20.74	0.55					
	DOVER COAST BLVD.	SA35	SA34	N	0.000	4.891		1.80			441	4.00	0.64	6.13	6.77	0.013	250	0.40	37.61	0.59	54.8	0.219	0.030	190.55	189.33
	DOVER COAST BLVD.	SA34	SA33	N	0.000	4.891		1.80			441	4.00	0.64	6.13	6.77	0.013	250	0.40	37.61	0.59	50.5	0.202	0.030	189.30	189.10
	DOVER COAST BLVD.	SA33	SA32	N	0.000	4.891		1.80			441	4.00	0.64	6.13	6.77	0.013	250	0.40	37.61	0.59	43.2	0.173	0.030	189.07	189.90
	DOVER COAST BLVD.	SA32	SA31	N	0.000	4.891		1.80			441	4.00	0.64	6.13	6.77	0.013	250	0.40	37.61	0.59	40.4	0.162	0.030	189.87	189.71
A3 (Residential)	DOVER COAST BLVD.	INSP.MH 44	SA31	N	1.740	1.740		1.80	112	202	202	4.15	0.23	2.90	3.13	0.013	200	0.40	20.74	0.48				189.75	189.71
A3a (Medial Centre)	BARRETT COURT	INSP.MH 49	SA48		0.990	0.990				* 18	18	4.40	0.13	0.28	0.40	0.013	200	0.40	20.74	0.00	17.2	0.069	0.030	189.97	189.90
	BARRETT COURT	SA48	SA47		0.000	0.990				0	18	4.40	0.13	0.28	0.40	0.013	200	0.40	20.74	0.00	65.6	0.262	0.030	189.87	189.61
	BARRETT COURT	SA47	SA30		0.000	0.990				0	18	4.40	0.13	0.28	0.40	0.013	200	0.40	20.74	0.00	70.9	0.284	0.030	189.58	189.30
	DOVER COAST BLVD.	SA31	SA30	N	0.000	6.631		1.80			643	3.92	0.86	8.74	9.60	0.013	250	0.39	37.14	0.62	94.5	0.369	0.030	189.68	189.30
	DOVER COAST BLVD.	SA30	SA29	N	0.000	6.631		1.80			643	3.92	0.86	8.74	9.60	0.013	250	0.40	37.61	0.63	78.7	0.315	0.030	189.27	188.95
A4 (RETIREMENT RESIDENCE)	DOVER COAST BLVD.	INSP.MH 43	SA29	N	2.618	2.618	160	(Beds)		240	240	4.12	0.34	3.43	3.77	0.013	200	0.40	20.74	0.51				189.04	188.99
	DOVER COAST BLVD.	SA29	SA28	N	0.000	9.249		1.80			883	3.83	1.20	11.75	12.96	0.013	250	0.40	37.61	0.68	100.0	0.400	0.030	188.92	188.52
A31	SCHOONER DRIVE	SA37	SA36	N	0.682	0.682		1.80	13	23	23	4.37	0.09	0.36	0.44	0.013	200	0.70	27.44	0.22	95.4	0.668	0.030	189.92	189.25
A30	SCHOONER DRIVE	SA36	SA28A	N	0.675	1.357		1.80	11	20	43	4.33	0.18	0.65	0.83	0.013	200	0.70	27.44	0.30	83.2	0.582	0.030	189.22	188.64
	SCHOONER DRIVE	SA28A	SA28	N		1.357					43	4.33	0.18	0.65	0.83	0.013	200	0.70	27.44	0.30	12.5	0.088	0.030	188.61	188.52
A5	DOVER COAST BLVD.	SA28	SA27	N	9.249	19.855		1.80	142	256	1182	3.75	2.58	15.40	17.98	0.013	250	0.25	29.73	0.65	52.5	0.131	0.030	188.49	188.36
A6	DOVER COAST BLVD.	SA27	SA26	N	0.286	20.141					1182	3.75	2.62	15.40	18.01	0.013	250	0.25	29.73	0.65	46.3	0.116	0.030	188.33	188.22
A7 (PRIVATE CLUBHOUSE)	DOVER COAST BLVD.	SA26	SA25	N	1.515	21.656				60	1242	3.74	2.82	16.11	18.93	0.013	250	0.25	29.73	0.65	45.8	0.115	0.030	188.17	188.06
	DOVER COAST BLVD.	SA25	SA24	N		21.656					1242	3.74	2.82	16.11	18.93	0.013	250	0.25	29.73	0.65	46.7	0.117	0.030	188.04	187.93
A8	DOVER COAST BLVD.	SA24	SA23	N	8.934	30.590		1.80	207	372	1614	3.66	3.98	20.49	24.46	0.013	250	0.25	29.73	0.68	71.2	0.178	0.030	187.90	187.72
	DOVER COAST BLVD.	SA23	SA22	N		30.590					1614	3.66	3.98	20.49	24.46	0.013	250	0.25	29.73	0.68	73.6	0.184	0.030	187.69	187.50
	DOVER COAST BLVD.	SA22	SA21	N		30.590					1614	3.66	3.98	20.49	24.46	0.013	250	0.25	29.73	0.68	77.1	0.193	0.030	187.47	187.28
A9	DOVER COAST BLVD.	SA21	SA20	N	0.405	30.995					1614	3.66	4.03	20.49	24.52	0.013	250	0.25	29.73	0.68	100.0	0.250	0.030	187.25	187.01
A10	NEW LAKESHORE	SA20	SA19	N	1.648	32.643		2.75	6	17	1630	3.65	4.24	20.68	24.92	0.013	300	0.25	48.35	0.69	40.2	0.101	0.030	186.98	186.87
	NEW LAKESHORE	SA19	EX. SANMH	N		32.643					1630	3.65	4.49	20.68	25.17	0.013	300	0.25	48.35	0.00	73.8	0.185	0.030	186.64	186.69
A11	NEW LAKESHORE			N	0.917	33.560		2.75	3	8	1638	3.65	4.75	20.77	25.52	0.013	300	0.22	45.36	0.67	66.2	0.146	0.030		
A12	NEW LAKESHORE			N	0.890	34.450		2.75	3	8	1647	3.65	5.00	20.87	25.87	0.013	300	0.23	46.37	0.68	61.5	0.141	0.030		
A13	NEW LAKESHORE			N	0.864	35.314		2.75	3	8	1655	3.65	5.24	20.96	26.20	0.013	300	0.24	47.37	0.70	63.3	0.152	0.030		
A14	REGATTA DRIVE	SA18	SA17	N	0.564	0.564		1.80	9	16	16	4.39	0.07	0.25	0.32	0.013	200	0.40	20.74	0.17	56.4	0.226	0.030	188.70	188.52
A15	REGATTA DRIVE	SA17	SA16	N	0.553	1.117		1.80	11	20	36	4.34	0.15	0.54	0.69	0.013	200	0.40	20.74	0.24	66.1	0.264	0.030	188.49	188.23
A16	REGATTA DRIVE	SA16	SA15	N	0.509	1.626		1.80	10	18	54	4.31	0.21	0.81	1.02	0.013	200	0.40	20.74	0.30	67.2	0.269	0.030	188.20	187.93
A17	REGATTA DRIVE	SA15	SA14	N	0.272	1.898		1.80	5	9	63	4.29	0.25	0.94	1.19	0.013	200	0.40	20.74	0.32	36.3	0.145	0.030	187.90	187.75
A18	REGATTA DRIVE	SA14	SA13	N	0.173	2.071		1.80	3	5	68	4.29	0.27	1.02	1.29	0.013	200	0.40	20.74	0.33	29.9	0.120	0.030	187.72	187.60
A19	REGATTA DRIVE	SA13	EX. SANMH	N	0.110	2.181		1.80	1	2	70	4.28	0.28	1.04	1.33	0.013	200	0.40	20.74	0.34				187.57	187.40
A20	VIKING LANE			N	0.600	0.600		1.80	10	18	18	4.39	0.08	0.27	0.35	0.013	200	0.40	20.74	0.17					
A21	REGATTA DRIVE			N	0.580	3.361		1.80	9	16	104	4.24	0.44	1.54	1.97	0.013	200	0.40	20.74	0.41					
A22	GAMBLE			N	0.460	0.460		1.80	9	16	16	4.39	0.06	0.25	0.31	0.013	200	0.40	20.74	0.16					
A23	REGATTA DRIVE			N	0.580	4.401		1.80	9	16	137	4.20	0.57	2.00	2.57	0.013	200	0.40	20.74	0.45					
A24	SCHOONER			N	0.480	0.480		1.80	7	13	13	4.40	0.06	0.19	0.26	0.013	200	0.40	20.74	0.15					
A25	REGATTA DRIVE			N	0.160	5.041		1.80	2	4	153	4.19	0.66	2.22	2.88	0.013	200	0.40	20.74	0.47					
A26	REGATTA DRIVE			N	0.100	5.141		1.80	0	0	153	4.19	0.67	2.22	2.89	0.013	200	0.40	20.74	0.47					
A27	NEW LAKESHORE			N	1.031	41.486		2.75	5	14	1822	3.62	6.20	22.88	29.07	0.013	300	0.27	50.25	0.75					
A28	NEW LAKESHORE			N	1.709	43.195		2.75	6	17	1838	3.61	6.67	23.07	29.74	0.013	300	0.21	44.31	0.68					
A29	NEW LAKESHORE			N	0.092	43.287		2.75	0	0	1838	3.61	6.70	23.07	29.77	0.013	300	0.25	48.35	0.73					
A32	SCHOONER DRIVE		SA12	N	0.108	0.108		1.80	0	0	0	4.50	0.01	0.00	0.01										
A33	SCHOONER DRIVE	SA12	SA11	N	0.333	0.441		1.80	4	7	7	4.43	0.06	0.11	0.17	0.013	200	0.70	27.44	0.16	67.2	0.470	0.030	190.48	190.01
A34	SCHOONER DRIVE	SA11	SA10	N	0.333	0.774		1.80	4	7	14	4.40	0.10	0.22	0.32	0.013	200	0.60	25.40	0.19	67.0	0.402	0.030	189.98	189.58
A35	SCHOONER DRIVE	SA10	SA9	N	0.506	1.280		1.80	6	11	25	4.37	0.17	0.38	0.55	0.013	200	0.40	20.74	0.21	100.0	0.400	0.030	189.55	189.15
A36	SCHOONER DRIVE	SA9	SA7	N	0.500	1.780		1.80	6	11	36	4.34	0.23	0.54	0.77	0.013	200	0.41	21.00	0.26	100.0	0.410	0.030	189.12	188.17
A37	SCHOONER DRIVE	SA7	SA6	N	0.431	2.211		1.80	5	9	45	4.32	0.29	0.68	0.96	0.013	200	0.40	20.74	0.29	100.0	0.400	0.030	188.68	188.28
A38	SCHOONER DRIVE	SA6	SA5	N	0.171	2.382		1.80	1	2	47	4.32	0.31	0.70	1.01	0.013	200	0.38	20.22	0.29	23.7	0.090	0.030	188.25	188.16
A39	SCHOONER DRIVE	SA5	SA4	N	0.502	2.884		1.80	9	16	63	4.29	0.37	0.94	1.31	0.013	200	0.38	20.22	0.33	78.5	0.298	0.030	188.13	187.82
A40	SCHOONER DRIVE	SA4	EX.CAP	N	0.543	3.427		1.80	10	18	81	4.27	0.45	1.20	1.65	0.013	200	0.40	20.74	0.38	58.7	0.235	0.030	187.79	187.55
A41	SCHOONER DRIVE	EX.CAP	EX.SANMH	N	0.270	3.697		1.80	4	7	88	4.26	0.48	1.30	1.78	0.013	200	0.46	22.24	0.41	34.8	0.160	0.030	187.55	187.39
A42	VIKING			N	0.520	0.520		1.80	9	16	16	4.39	0.07	0.25	0.31	0.013	200	0.50	23.19	0.18	101.5	0.508			
A43	SCHOONER			N	0.570	4.787		1.80	8	14	119	4.22	0.62	1.74	2.36	0.013	200	0.50	23.19	0.47	63.6	0.318			
A44	GAMBLE			N	0.410	0.410		1.80	8	14	14	4.40	0.05	0.22	0.27	0.013	200	0.50	23.19	0.17	91.7	0.459			
A45	SCHOONER			N	0.430	0.430		1.80	7	13	13	4.40	0.06	0.19	0.25	0.013	200	0.50	23.19	0.16	69.9	0.350			
A46	SCHOONER			N	0.200	0.630		1.80	2	4	16	4.39	0.08	0.25	0.33	0.013	200	0.50	23.19	0.18	17.4	0.087			
A47	SCHOONER			N	0.580	1.210		1.80	9	16	32	4.35	0.16	0.49	0.65	0.013	200	0.50	23.19	0.25	65.7	0.329			
A48	BENSON			N	0.090	6.497		1.80	0	0	166	4.18	0.84	2.40	3.25	0.013	200	0.50	23.19	0.53	48.5	0.243			
	HIGHWAY 6			N	0.000	71.140		2.75	0	0	5869	3.18	9.25	64.80	74.05	0.013	375	0.25	87.66	0.89	53.4	0.134			
	HIGHWAY 6			N	0.000	71.140		2.75	0	0	5869	3.18	9.25	64.80	74.05	0.013	375	0.25	87.66	0.89	57.2	0.143			
	HIGHWAY 6			N	0.000	71.140		2.75	0	0	5869	3.18	9.25	64.80	74.05	0.013	375	0.25	87.66	0.89	100.0	0.250			
	HIGHWAY 6			N	0.000	71.140		2.75	0	0	5869	3.18	9.25	64.80	74.05	0.013	375	0.25	87.66	0.89	14.6	0.037			
A49	LAKEVIEW			N	0.341	71.481		2.75	2	6	5875	3.18	9.34	64.85	74.20	0.013	**375**	0.25	87.66	0.89	71.0	0.178			
A50	LAKEVIEW			N	0.231	71.712		2.75	0	0	5875	3.18	9.41	64.85	74.26	0.013	375	0.25	87.66	0.89	55.6	0.139			
A51	LAKEVIEW			N	1.105	72.817		2.75	11	30	5905	3.18	9.72	65.14	74.86	0.013	**375**	0.25	87.66	0.89	100.8	0.252			
A52	LAKEVIEW			N	0.947	73.764		2.75	10	28	5932	3.18	9.98	65.41	75.39	0.013	375	0.25	87.66	0.90	99.4	0.249			
A53	LAKEVIEW			N	0.945	81.206		2.75	8	22	6062	3.17	11.09	66.65	77.74	0.013	**375**	0.25	87.66	0.90	87.8	0.220	0.030		
A54	LAKEVIEW			N	0.807	82.013		2.75	8	22	6084	3.16	11.32	66.86	78.18	0.013	**375**	0.25	87.66	0.91	86.0	0.215	0.030		
A55	LAKEVIEW			N	1.208	1.208		2.75	13	36	36	4.34	0.34	0.54	0.88	0.013	200	0.60	25.40	0.30					
A56	NEW LAKESHORE			N	0.190	126.508		2.75		0	7958	3.05	18.41	84.35	102.76	0.013	**450**	0.22	133.72	0.93	106.8	0.235	0.030		
A57	HIGHWAY 6			N	0.552	0.552		2.75	4	11	11	4.41	0.15	0.17	0.32	0.013	200	0.40	20.74	0.17					
A58	MARDON (N)			N	5.617	6.169		2.75	53	146	157	4.18	1.73	2.28	4.00	0.013	200	0.40	20.74	0.51					
A59	MARDON (S)			N	1.247	1.247		2.75	13	36	36	4.34	0.35	0.54	0.89	0.013	200	0.40	20.74	0.28					
A60	NEW LAKESHORE			N	0.183	134.107		2.75		0	8151	3.04	20.54	86.10	106.64	0.013	**450**	0.22	133.72	0.93	87.2	0.192	0.030		
A61	HIGHWAY 6			N	2.032	2.032		2.75			0	4.50	0.57	0.00	0.57	0.013	200	0.40	20.74	0.22					
A62	WOODHOUSE (N)			N	5.381	7.413		2.75	39	107	107	4.24	2.08	1.58	3.65	0.013	200	0.40	20.74	0.50					
A63	WOODHOUSE (S)			N	1.436	1.436		2.75	12	33	33	4.35	0.40	0.50	0.90	0.013	200	0.40	20.74	0.28					
A64	NEW LAKESHORE			N	0.174	142.956		2.75		0	8291	3.04	23.01	87.37	110.39	0.013	**450**	0.25	142.55	0.99	87.6	0.219	0.030		
A65	NEW LAKESHORE			N	3.755	146.711		2.75		0	8291	3.04	24.07	87.37	111.44	0.013	**450**	0.25	142.55	0.99	93.0	0.233	0.030		
A66	NEW LAKESHORE			N	2.372	149.083		2.75	30	83	8373	3.03	24.73	88.12	112.85	0.013	**450**	0.25	142.55	1.00	125.4	0.314	0.030		

Total Allocated Population = 372 People

MEDICAL CENTRE

*	Block Area	0.99 ha
	Sewage per OBC	275 L/day (per doctor)
	Sewage per OBC	75 L/day (per staff 8-hr shift)
	Total #	15 Offices + staff
	Sewage=	5250 L/day
	Equiv. Res. Pop	18 p

EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION

DETAILS	No.	REVISIONS	DATE	CONSULTANT
DESIGN BY JR	1	FIRST SUBMISSION TO COUNTY	MARCH 06/15	DE(L)L
DRAWN BY JR	2	SECOND SUBMISSION TO COUNTY	OCT. 29/15	DE(L)L
CHECKED BY JF	3	REVISED PER COUNTY COMMENTS	JUNE 01/16	DE(L)L
F.BK. 1054	4	ISSUED FOR APPROVAL	OCT. 14/16	DE(L)L
	5	ADDED MEDICAL CENTRE	JUNE 20/2017	DE(L)L
FILE: DEL13-124 MASTER SERVICING.DWG				

CONSULTANT OR DIVISION

Consulting Civil Engineers
41 Adelaide St. N., Unit 71
London, Ontario N6B 3P4
Phone (519) 672-8310
Fax (519) 672-4182
e-mail: deveng@deveng.net

development engineering (London) Limited
CONSULTING CIVIL ENGINEERS

ENGINEER'S STAMP
LICENSED PROFESSIONAL ENGINEER
L. R. MURRAY
100142445
15 Jun 17
PROVINCE OF ONTARIO

Norfolk COUNTY

SCALE

TITLE
DOVER COAST – MUNICIPAL WORKS
PORT DOVER, ONTARIO

MASTER SANITARY DESIGN SHEET

PROJECT No. DEL13-124
SHEET No. M10
PLAN FILE No.

J:\ourlond Jun.20/17--11:59pm DEL13-124 Master Servicing.dwg

Dear Community Development Partners:

On November 28, 2024 we met to share some proposed changes to our Development Standards/Guidelines and to receive your feedback on same.
The items discussed were:

1) **Water and Sanitary Demand and Output Parameters (including PPU component)**
2) **Fire Flow Targets**
3) Storm Pond Sizing and Construction Parameters
4) Servicing Standards
5) TIS Guidelines

We thank you again for the time taken to meet with us and to discuss these matters. The received comments and our responses to them are set out in the attached tables for your review. We are now proceeding to advise Council on matters 1 and 2 above. The remaining matters remain under review and we hope to address these in April/May. A separate report for each of these matters will be presented to **Council on Committee on March 11, 2025.** The report is now available and can be viewed online at: https://pub-norfolkcounty.escribemeetings.com/Meeting.aspx?Id=59305923-46d4-488b-8181-97e689742ec9&Agenda=Agenda&lang=English

To summarize the proposed changes on items 1 and 2 above are set out below.

Based on feedback and internal discussions, the proposed **Water and Sanitary Demand and Output parameters and associated persons per unit (PPU component)** are proposed to be revised to:

Proposed Per Capita Flow/Demand	
Water	285 L/c/d
Wastewater	285 L/c/d
Persons per unit Component (by zone basis)	
Low Density Res	25 units/ha at 3.0 ppu
Medium Density Res	75 units/ha at 2.4 ppu
High Density Res	150 units/ha at 1.6 ppu
Single and semi detach	3.0 ppu
Town/rowhomes	2.4 ppu
Apt and ADU's (2+ bdrm)	2.0 ppu
Apt and ADU's (1 bdrm)	1.6 ppu

Based on feedback and further internal review, Fire Flow Assessments will be completed through the following process to confirm that the **Available Fire Flow (AFF)** meets or exceeds the **Required Fire Flow (RFF)**:

The **Available Fire Flow (AFF)** will be determined through modeling or on-site hydrant testing (as confirmed by Norfolk County).

The **Required Fire Flow (RFF)** for a site will be determined as the greater of that defined by the Ontario Building Code calculation (applied to Part 3 AND Part 9 structures) for the highest demand structure on the site, **OR** the fire flow target as set out in the table below for the land use type. FUS calculations will no longer be required.

Land Use Fire Flow Target Table:

Land Use	Applicable Community	Proposed Land Use Fire Flow Target
Industrial	All communities	150
Institutional	All communities	150
Commercial	All communities	150
Small ICI (<1,800m^3)*	All communities	100
Residential (Single)**	Simcoe, Delhi, Port Dover	85
	Waterford, Port Rowan, Courtland	50
Residential – Multi > 3 units	Simcoe, Delhi, Port Dover	150
	Waterford, Port Rowan, Courtland	90
Residential – Multi <3 units (i.e. Semi-detach dwellings)	Simcoe, Delhi, Port Dover	125
	Waterford, Port Rowan, Courtland	70

*- This target level has been set for smaller forms of stand alone ICI structures.
**- For isolated cases of small scale Residential - Single development located where looping is not a realistic solution to achieving the target, a lower target may be reasonable at the discretion of Norfolk County

A draft form for the completion of the required Fire Flow assessment is attached.

Should you have any questions or comments, please contact myself of Jacob Columbus.

Sincerely,

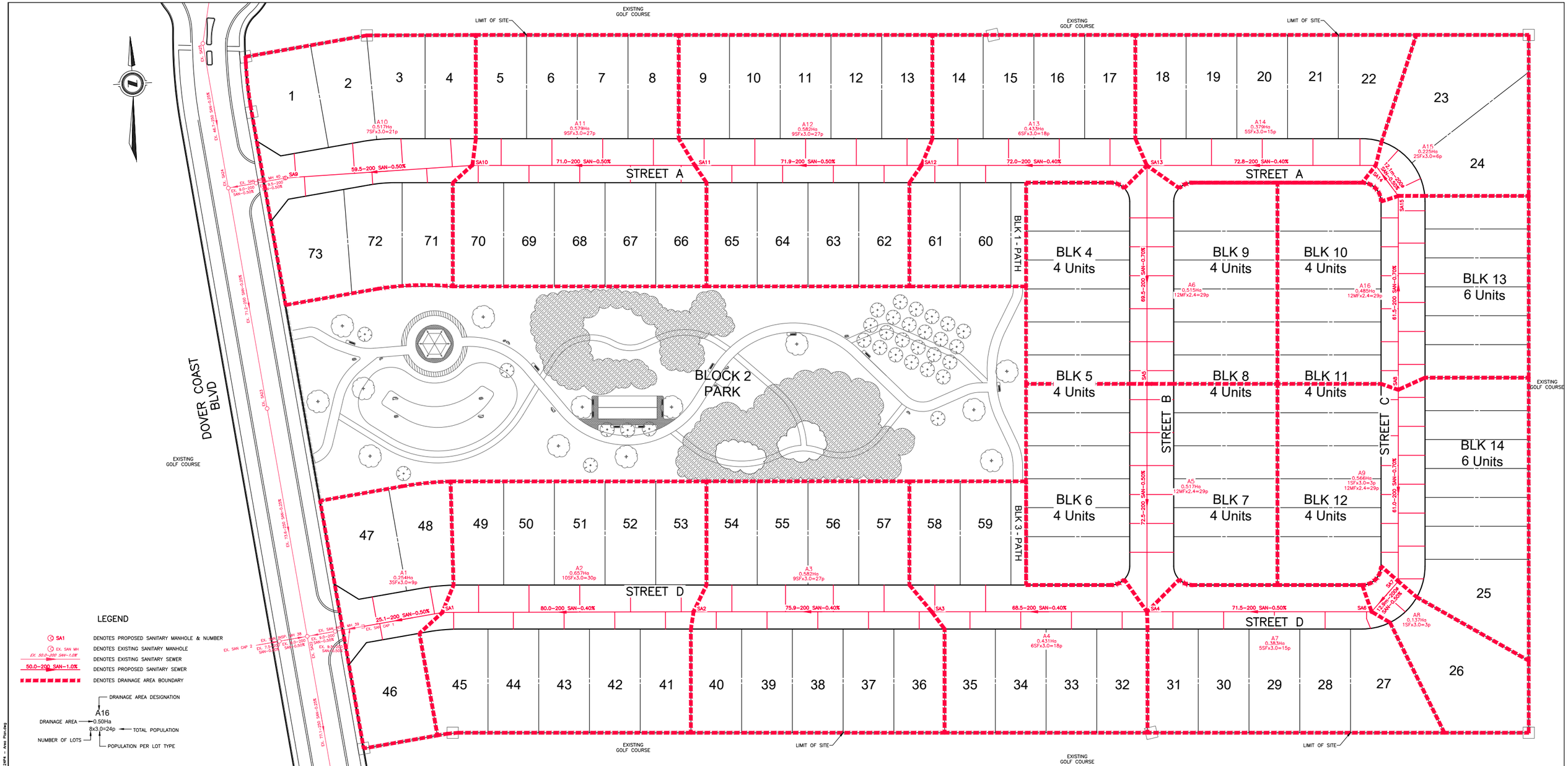
Darnell Lambert, C.E.T.
Director, Engineering
Gilbertson Administration Building
Engineering
12 Gilbertson Drive, Simcoe, Ontario, N3Y 4N5
519-426-5870 x1094

Norfolk COUNTY

Providing valued public services that are responsive to our community's needs

We are committed to providing high-quality customer service and a safe and respectful environment for all. Read our Respect and Responsibilities Policy at norfolkCounty.ca/RR.

Appendix B: Proposed Sanitary



EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION

DETAILS	No.	REVISIONS	DATE	CONSULTANT
DESIGN BY SW	1	1ST ENGINEERING SUBMISSION	MMM. DD/YY	DEVENG
DRAWN BY SW				
CHECKED BY DH/JF				
F.BK. ***				

No.	REVISIONS	DATE	CONSULTANT

FILE: DEL13-124P4 - AREA PLAN.DWG

CONSULTANT OR DIVISION

London Office
41 Adelaide St. N., Unit 71
(519) 672-8310

Paris Office
31 Mechanic St., Unit 301
(519) 442-1441

development engineering (London) Limited
CONSULTING CIVIL ENGINEERS

ENGINEER'S STAMP

SCALE

SCALE - 1:500

5 0 10m

NTS IF REDUCED FROM 22"X40"

TITLE

DOVER COAST - PHASE 4
PORT DOVER, ONTARIO

SANITARY AREA PLAN

PROJECT No. DEL13-124P4

SHEET No. 3

PLAN FILE No.

DEL13-124P4 - Area Plan.dwg
Jul 17/25 - 21:16pm

RUNOFF COEFFICIENT 'C'

PARKS & PLAYGROUNDS	0.25
RESIDENTIAL - SINGLE/SEMI	0.45
- ROWHOUSING	0.75

FLOW Q = 2.78 ACI
Q = PEAK FLOW IN LITRES PER SECOND (l/s)
A = AREA IN HECTARES (ha)
C = RUNOFF COEFFICIENT
i = RAINFALL INTENSITY IN MILLIMETERS PER HOUR (mm/hr)
RETURN PERIOD= 5 years

STORM SEWER DESIGN SHEET
NORFOLK COUNTY
DEL13-124P4

DRAINAGE AREA: 7.65 ha
DESIGNED BY: SW
CHECKED BY: DH
DATE: July 15, 2025

LOCATION			AREA			A X C						RAINFALL INTENSITY			SEWER DESIGN								PROFILE				
												TIME ENTRY														INVERT ELEVATION	
STREET	FROM	TO	ID	DELTA AREA ha.	TOTAL AREA ha.	'C'	INCR A x C	TOTAL SECTION	TOTAL LATERAL	TOTAL SEWER	TOTAL 2.78 x AxC	SECT. min.	PASTE min.	INTENS. 'i' mm/hr	Q l/s	PIPE Dia. Mm	DESIGN SLOPE %	n	CAPACITY l/s	ACTUAL VELOCITY m./s.	LENGTH m	TIME OF FLOW minutes	HEAD LOSSES m	DROP IN MH m	SEWER FALL m	U.S. m	D.S. m
STREET A	ST21	ST20	D21	0.358	0.358	0.45	0.161	0.000		0.161	0.448		15.00	76.40	34.23	300	1.00	0.013	96.70	1.218	32.3	0.44	0.000	0.020	0.323	190.829	190.506
STREET A	ST20	ST19	D20	0.142	0.500	0.45	0.064	0.161		0.225	0.626	0.44	15.44	75.12	47.02	300	0.40	0.013	61.16	0.957	25.3	0.44	0.000	0.020	0.101	190.486	190.385
STREET A	ST19	ST18	D19	0.081	0.581	0.45	0.036	0.225		0.261	0.727	0.44	15.88	73.91	53.73	300	0.40	0.013	61.16	0.982	23.1	0.39	0.000	0.075	0.093	190.365	190.273
STREET A	ST18	ST17	D18	0.281	0.862	0.51	0.143	0.261		0.405	1.125	0.39	16.27	72.83	81.93	375	0.40	0.013	110.87	1.105	48.5	0.73	0.000	0.075	0.194	190.198	190.004
STREET A	ST17	ST16	D17	0.293	1.155	0.51	0.150	0.405		0.554	1.541	0.73	17.00	70.95	109.33	450	0.30	0.013	156.16	1.074	48.5	0.75	0.000	0.020	0.145	189.929	189.784
STREET A	ST16	ST15	D16	0.293	1.448	0.51	0.150	0.554		0.704	1.957	0.75	17.75	69.14	135.30	450	0.30	0.013	156.16	1.111	48.5	0.73	0.000	0.075	0.145	189.764	189.618
STREET A	ST15	ST14	D15	0.293	1.742	0.51	0.150	0.704		0.853	2.372	0.73	18.48	67.48	160.06	525	0.30	0.013	235.58	1.185	48.5	0.68	0.000	0.020	0.145	189.543	189.398
STREET A	ST14	ST13	D14	0.274	2.016	0.51	0.140	0.853		0.993	2.761	0.68	19.16	66.02	182.27	525	0.30	0.013	235.58	1.204	46.2	0.64	0.019	0.075	0.139	189.378	189.238
STREET A	ST13	EX. STM CAP 3	D13	0.132	2.148	0.51	0.067	0.993		1.060	2.948	0.64	19.80	64.71	190.76	600	0.50	0.013	434.16	1.471	19.8	0.22	0.000		0.099	189.163	189.064
STREET C	ST12	ST11	D12	0.100	0.100	0.45	0.045	0.000		0.045	0.125		15.00	76.40	9.55	300	1.00	0.013	96.70	0.861	8.1	0.16	0.054	0.075	0.081	190.996	190.915
STREET C	ST11	ST10	D11	0.483	0.583	0.75	0.362	0.045		0.407	1.132	0.16	15.16	75.93	85.95	375	0.50	0.013	123.96	1.226	57.8	0.79	0.000	0.075	0.289	190.840	190.551
STREET C	ST10	ST9	D10	0.526	1.109	0.75	0.395	0.407		0.802	2.229	0.79	15.95	73.69	164.26	450	0.50	0.013	201.60	1.414	57.8	0.68	0.072	0.072	0.289	190.476	190.187
STREET C	ST9	ST8	D9	0.039	1.148	0.69	0.027	0.802		0.829	2.304	0.68	16.63	71.89	165.63	450	0.50	0.013	201.60	1.416	18.4	0.22	0.081	0.081	0.092	190.115	190.023
STREET D	ST8	ST5	D8	0.143	1.291	0.69	0.099	0.829		0.927	2.578	0.22	16.85	71.35	183.94	525	0.50	0.013	304.13	1.497	67.2	0.75	0.000	0.020	0.336	189.942	189.606
STREET B	ST19.S	ST7	D7	0.274	0.274	0.75	0.205	0.000		0.205	0.571		15.00	76.40	43.63	300	1.00	0.013	96.70	1.323	53.1	0.67	0.000	0.075	0.531	190.861	190.330
STREET B	ST7	ST6	D6	0.238	0.512	0.75	0.179	0.205		0.384	1.067	0.67	15.67	74.47	79.45	375	0.50	0.013	123.96	1.211	39.4	0.54	0.000	0.075	0.197	190.255	190.058
STREET B	ST6	ST5	D5	0.301	0.813	0.75	0.226	0.384		0.610	1.695	0.54	16.21	72.99	123.71	450	0.50	0.013	201.60	1.355	49.5	0.61	0.146	0.150	0.248	189.983	189.736
STREET D	ST5	ST4	D4	0.160	2.264	0.69	0.110	0.927	0.610	1.647	4.580	Tc1	17.29	70.24	321.68	600	0.50	0.013	434.16	1.690	69.0	0.68	0.000	0.020	0.345	189.586	189.241
STREET D	ST4	ST3	D3	0.275	2.539	0.69	0.190	1.647		1.837	5.107	0.68	17.97	68.63	350.48	600	0.50	0.013	434.16	1.710	81.5	0.79	0.000	0.020	0.407	189.221	188.814
STREET D	ST3	ST2	D2	0.253	2.792	0.69	0.175	1.837		2.012	5.593	0.79	18.76	66.89	374.11	600	0.50	0.013	434.16	1.734	77.1	0.74	0.000	0.020	0.386	188.794	188.408
STREET D	ST2	ST1	D1	0.157	2.949	0.69	0.108	2.012		2.120	5.894	0.74	19.50	65.33	385.08	600	0.50	0.013	434.16	1.749	30.4	0.29	0.000	0.020	0.152	188.388	188.236
BLOCK 2 - PARK	CBMH1-P	ST1		2.549	2.549	0.25	0.637	0.000		0.637	1.772		15.00	76.40	135.38	450	0.30	0.013	156.16	1.111	43.8	0.66	0.000		0.131	188.667	188.536

Tc 1 17.29

$$T_c = \frac{(T_{c1} * Q_1) + (T_{c2} * Q_2)}{(Q_1 + Q_2)}$$

$$= \frac{(17.60 \times 183.94) + (16.82 \times 123.71)}{(183.94 + 123.71)}$$

$$= 17.29 \text{ min}$$

$T_{c1} = 16.85 + 0.75 = 17.60$

$T_{c2} = 16.21 + 0.61 = 16.82$

RESIDENTIAL POPULATIONS DENSITIES

AREA / ZONING BASIS
LOW DENSITY (SINGLE FAMILY) - 25 UNITS PER HECTARE @ 3 PEOPLE / UNIT
MEDIUM DENSITY (MULTI-FAMILY) - 75 UNITS PER HECTARE @ 2.4 PEOPLE / UNIT
HIGH DENSITY - 150 UNITS PER HECTARE @ 1.6 PEOPLE / UNIT
LOT BASIS
SINGLE FAMILY AND SEMI-DETACHED - 3 PEOPLE PER UNIT
TOWNHOMES - 2.4 PEOPLE PER UNIT

SANITARY SEWER DESIGN SHEET
NORFOLK COUNTY
DOVER COAST PHASE 4

$$Q(peak\ flow\ L/s) = \left(\frac{(population\ x\ per\ capita\ flow\ x\ peaking\ factor\ x\ uncertainty)}{24\ x\ 60\ x\ 60}\right) + infiltration$$

Per capita flow = 285 litres/capita/day
Peaking Factor = Harmon Formula $M = 1 + \left(\frac{14}{4 + P^{0.5}}\right)$
Uncertain Development Factor = 1.0 or 1.1 (situation dependent)
Infiltration Allowance = 24192 litres/hectare/day (0.28L/ha/s)

SANITARY AREA: 7.23 ha
DESIGNED BY:SW
CHECKED BY: DH
DATE: July 15, 2025

LOCATION				AREA			POPULATION					SEWAGE FLOW				SEWER DESIGN					PROFILE					
AREA ID	STREET	FROM	TO	NET OR GROSS	Δ AREA Ha.	TOTAL AREA Ha.	PER Ha.	PER LOT	NO. OF LOTS	Δ POP.	TOTAL POP.	INFILTRATION (l/s)	PEAKING FACTOR (M)	SEWAGE (l/s)	TOTAL (l/s)	"n"	SIZE (mm)	DESIGN SLOPE %	CAPACITY (l/s)	VELOCITY (m/s)	LENGTH (m/s)	DROP IN D.S. MH (m)	FALL IN SEWER (m)	HEAD LOSS (m)	INVERT U.S. m	ELEV. D.S. m
A16	STREET C	SA8.N	SA15	G	0.485	0.485		2.4	12	29	29	0.136	4.358	0.414	0.591	0.013	200	0.70	27.442	0.873	61.5	0.050	0.431		190.299	189.868
A15	STREET A	SA15	SA14	G	0.225	0.710		3.0	2	6	35	0.199	4.344	0.499	0.748	0.013	200	0.50	23.193	0.738	12.1	0.050	0.061		189.818	189.758
A14	STREET A	SA14	SA13	G	0.379	1.089		3.0	5	15	50	0.305	4.315	0.709	1.085	0.013	200	0.40	20.745	0.660	72.8	0.020	0.291		189.708	189.417
A13	STREET A	SA13	SA12	G	0.433	1.522		3.0	6	18	68	0.426	4.286	0.959	1.481	0.013	200	0.40	20.745	0.660	72.0	0.020	0.288		189.397	189.109
A12	STREET A	SA12	SA11	G	0.582	2.104		3.0	9	27	95	0.589	4.250	1.329	2.051	0.013	200	0.50	23.193	0.738	71.9	0.020	0.359		189.089	188.729
A11	STREET A	SA11	SA10	G	0.579	2.683		3.0	9	27	122	0.751	4.219	1.695	2.616	0.013	200	0.50	23.193	0.738	71.0	0.020	0.355		188.709	188.355
A10	STREET A	SA10	SA9	G	0.517	3.200		3.0	7	21	143	0.896	4.198	1.977	3.071	0.013	200	0.50	23.193	0.738	59.5	0.050	0.298		188.335	188.037
	STREET C		SA7					3.0	1	3	3															
A9	STREET C	SA8.S	SA7	G	0.556	0.556		2.4	12	29	29	0.156	4.358	0.414	0.611	0.013	200	0.70	27.442	0.873	61.0	0.050	0.427		189.689	189.262
A8	STREET D	SA7	SA6	G	0.137	0.693		3.0	1	3	35	0.194	4.344	0.499	0.743	0.013	200	0.50	23.193	0.738	12.9	0.050	0.065		189.212	189.147
A7	STREET D	SA6	SA4	G	0.383	1.076		3.0	5	15	50	0.301	4.315	0.709	1.081	0.013	200	0.50	23.193	0.738	71.5	0.020	0.357		189.097	188.740
A6	STREET B	SA13.S	SA5	G	0.515	0.515		2.4	12	29	29	0.144	4.358	0.414	0.599	0.013	200	0.70	27.442	0.873	69.5	0.020	0.487		189.669	189.182
A5	STREET B	SA5	SA4	G	0.517	1.032		2.4	12	29	58	0.289	4.302	0.817	1.188	0.013	200	0.50	23.193	0.738	72.5	0.080	0.363		189.163	188.800
A4	STREET D	SA4	SA3	G	0.431	2.539		3.0	6	18	125	0.711	4.215	1.744	2.629	0.013	200	0.40	20.745	0.660	68.5	0.020	0.274		188.720	188.446
A3	STREET D	SA3	SA2	G	0.582	3.121		3.0	9	27	152	0.874	4.189	2.106	3.191	0.013	200	0.40	20.745	0.660	75.9	0.020	0.304		188.426	188.122
A2	STREET D	SA2	SA1	G	0.657	3.778		3.0	10	30	182	1.058	4.162	2.504	3.812	0.013	200	0.40	20.745	0.660	80.0	0.020	0.320		188.102	187.783
A1	STREET D	SA1	SAN STUB 1	G	0.254	4.032		3.0	3	9	191	1.129	4.155	2.623	4.014	0.013	200	0.50	23.193	0.738	25.1	0.050	0.126		187.763	187.637

Total Proposed Population = 334 People

EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION

DETAILS
DESIGN BY SW
DRAWN BY SW
CHECKED BY DH/JF
F.BK. ***

No.	REVISIONS	DATE	CONSULTANT
1	1ST ENGINEERING SUBMISSION	MMM. DD/YY	DEVENG

No.	REVISIONS	DATE	CONSULTANT
	FILE: DEL13-124P4 - AREA PLAN.DWG		

CONSULTANT OR DIVISION
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Paris Office
31 Mechanic St., Unit 301
(519) 442-1441
development engineering (London) Limited
CONSULTING CIVIL ENGINEERS

ENGINEER'S STAMP

SCALE

TITLE
DOVER COAST – PHASE 4
PORT DOVER, ONTARIO
STORM AND SANITARY DESIGN SHEETS

PROJECT No. DEL13-124P4
SHEET No. 4
PLAN FILE No.

DEL13-124P4 - Area Plan.dwg
Jul 17,25 - 12:16pm

STAGE 1-2 ARCHAEOLOGICAL ASSESSMENT
HIGHWAY 6 ROUNDABOUT
PART OF LOT 16, CONCESSION 1
(FORMER TOWNSHIP OF WOODHOUSE)
COUNTY OF NORFOLK, ONTARIO

ORIGINAL REPORT

Prepared for:

Hatch Limited
2800 Speakman Drive
Mississauga, ON L5K 2R7
T 289-326-1312

Archaeological Licence #P383 (Williams)
Ministry of Heritage, Sport, Tourism and Culture Industries PIF# P383-0242-2020
ASI File: 20EA-230

4 June 2021

ASI Providing Archaeological & Cultural Heritage Services
528 Bathurst Street Toronto, ONTARIO M5S 2P9
416-966-1069 F 416-966-9723 asiheritage.ca

Stage 1-2 Archaeological Assessment
Highway 6 Roundabout
Part of Lot 16, Concession 1
(Former Township of Woodhouse)
County of Norfolk, Ontario

EXECUTIVE SUMMARY

Archaeological Services Inc (ASI) was contracted by Hatch Limited to conduct a combined Stage 1-2 Archaeological Assessment (Background Research and Property Inspection) as part of the Highway 6 Roundabout in the County of Norfolk. This project involves the design and construction of a traffic roundabout on Highway 6 that will service planned residential subdivisions.

While the Stage 2 property survey was still in progress, background research determined that the lands had been previously assessed by Mayer Heritage Consultant Inc. in 2006. ASI's Stage 2 pedestrian survey did not encounter any archaeological resources. A small area that ASI was unable to assess in 2020 has been determined to be previously assessed by Mayer Heritage Consultants Inc. in 2006 by pedestrian survey at 5 m intervals. No archaeological sites were noted in this area during the previous assessment. The Study Area for the Highway 6 Roundabout project can be considered free of archaeological concern and no further assessment is required.

PROJECT PERSONNEL

Senior Project Manager:	Lisa Merritt, MSc. (P094) *Partner / Director* *Environmental Assessment Division*
Project Coordinator:	Hannah Brouwers, Hon. BA (R1270) *Archaeologist / Project Administrator* *Environmental Assessment Division*
	Katrina Thach, Hon. BA (R1225) *Archaeologist / Project Coordinator* *Environmental Assessment Division*
Project Director (Licensee) and Project Manager:	Blake Williams, MLitt (P383) *Lead Archaeologist / Project Manager* *Environmental Assessment Division*
Field Director:	Sean Heafner, BSc (R1253) *Field Director* *Environmental Assessment Division*
Field Archaeologist:	Doug Todd (R055) *Associate Archaeologist / Analyst – Laboratory and Fieldwork Services, Operations Division*
Report Preparation:	Blake Williams
Graphics:	Robin Latour, MPhil, PDip *Associate Archaeologist / Geomatics Specialist* *Operations Division*
Report Review:	Eliza Brandy, MA (R1109) *Associate Archaeologist / Project Manager* *Environmental Assessment Division*
	Lisa Merritt

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

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1.0 PROJECT CONTEXT

Archaeological Services Inc. (ASI) was contracted by Hatch Limited to conduct a combined Stage 1-2 Archaeological Assessment (Background Research and Property Inspection) as part of the Highway 6 Roundabout in the County of Norfolk (Figure 1). This project involves the design and construction of a traffic roundabout on Highway 6 that will service planned residential subdivisions.

All activities carried out during this assessment were completed in accordance with the *Ontario Heritage Act* (1990, as amended in 2018) and the 2011 *Standards and Guidelines for Consultant Archaeologists* (S & G), administered by the Ministry of Tourism, Culture and Sport (MTCS 2011; now administered by the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI)).

1.1 Development Context

All work has been undertaken as required by the *Environmental Assessment Act*, RSO (Ministry of the Environment 1990 as amended 2010) and regulations made under the Act, and are therefore subject to all associated legislation. This project is being conducted in accordance with the Municipal Engineers' Association document *Municipal Class Environmental Assessment* (2000 as amended in 2007, 2011 and 2015).

ASI has been actively engaging with Indigenous communities who have expressed an interest in the archaeological work within the Study Area for this project on behalf of the Ontario Ministry of Transportation. A detailed account of all Indigenous engagement can be found in the *Supplementary Documentation (SD): Indigenous Engagement* document associated with this report.

Authorization to carry out the activities necessary for the completion of the Stage 1-2 archaeological assessment was granted by Hatch Limited on November 30, 2020.

1.2 Historical Context

The purpose of this section, according to the S & G, Section 7.5.7, Standard 1, is to describe the past and present land use and the settlement history and any other relevant historical information pertaining to the Study Area. A summary is first presented of the current understanding of the Indigenous land use of the Study Area. This is then followed by a review of the historical Euro-Canadian settlement history.

1.2.1 Indigenous Land Use and Settlement

Southern Ontario has been occupied by human populations since the retreat of the Laurentide glacier approximately 13,000 years before present (BP) (Ferris 2013). Populations at this time would have been highly mobile, inhabiting a boreal-parkland similar to the modern sub-arctic. By approximately 10,000 BP, the environment had progressively warmed (Edwards and Fritz 1988) and populations now occupied less extensive territories (Ellis and Deller 1990).

Between approximately 10,000-5,500 BP, the Great Lakes basins experienced low-water levels, and many sites which would have been located on those former shorelines are now submerged. This period produces the earliest evidence of heavy wood working tools, an indication of greater investment of labour in felling

trees for fuel, to build shelter, and watercraft production. These activities suggest prolonged seasonal residency at occupation sites. Polished stone and native copper implements were being produced by approximately 8,000 BP; the latter was acquired from the north shore of Lake Superior, evidence of extensive exchange networks throughout the Great Lakes region. The earliest evidence for cemeteries dates to approximately 4,500-3,000 BP and is indicative of increased social organization, investment of labour into social infrastructure, and the establishment of socially prescribed territories (Ellis et al. 1990; Ellis et al. 2009; Brown 1995:13).

Between 3,000-2,500 BP, populations continued to practice residential mobility and to harvest seasonally available resources, including spawning fish. The Woodland period begins around 2,500 BP and exchange and interaction networks broaden at this time (Spence et al. 1990:136, 138) and by approximately 2,000 BP, evidence exists for small community camps, focusing on the seasonal harvesting of resources (Spence et al. 1990:155, 164). By 1,500 BP there is macro botanical evidence for maize in southern Ontario, and it is thought that maize only supplemented people's diet. There is earlier phytolithic evidence for maize in central New York State by 2,300 BP - it is likely that once similar analyses are conducted on Ontario ceramic vessels of the same period, the same evidence will be found (Birch and Williamson 2013:13–15). As is evident in detailed Anishinaabek ethnographies, winter was a period during which some families would depart from the larger group as it was easier to sustain smaller populations (Rogers 1962). It is generally understood that these populations were Algonquian-speakers during these millennia of settlement and land use.

From the beginning of the Late Woodland period at approximately 1,000 BP, lifeways became more similar to that described in early historical documents. Between approximately 1000-1300 Common Era (CE), the communal site is replaced by the village focused on horticulture. Seasonal disintegration of the community for the exploitation of a wider territory and more varied resource base was still practised (Williamson 1990:317). By 1300-1450 CE, this episodic community disintegration was no longer practised and populations now communally occupied sites throughout the year (Dodd et al. 1990:343). From 1450-1649 CE this process continued with the coalescence of these small villages into larger communities (Birch and Williamson 2013). Through this process, the socio-political organization of the First Nations, as described historically by the French and English explorers who first visited southern Ontario, was developed.

By 1600 CE, the Huron- Wendat communities within Simcoe County had formed the Confederation of Nations encountered by the first European explorers and missionaries. Samuel de Champlain in 1615 reported that a group of Iroquoian-speaking people situated between the Haudenosaunee and the Huron-Wendat were at peace and remained "la nation neutre". Like the Huron-Wendat, Petun, and Haudenosaunee, the Neutral people were settled village agriculturalists. In the 1640s, the Neutral and the Huron-Wendat (and their Algonquian allies such as the Nippissing and Odawa) were decimated by epidemics and ultimately dispersed by the Haudenosaunee. Shortly afterwards, the Haudenosaunee established a series of settlements at strategic locations along the trade routes inland from the north shore of Lake Ontario. By the 1690s however, the Anishinaabeg were the only communities with a permanent presence in southern Ontario. From the beginning of the eighteenth century to the assertion of British sovereignty in 1763, there was no interruption to Anishinaabeg control and use of southern Ontario.

1.2.2 Treaties

The Study Area is within Treaty 3, the Between the Lakes Purchase. Following the 1764 Niagara Peace Treaty and the follow-up treaties with Pontiac, the English colonial government considered the Mississaugas to be their allies since they had accepted the Covenant Chain. The English administrators

followed the terms of the Royal Proclamation and insured that no settlements were made in the hunting grounds that had been reserved for their use (Johnston 1964; Lytwyn 2005). In 1784, under the terms of the "Between the Lakes Purchase" signed by Sir Frederick Haldimand and the Mississaugas, the Crown acquired over one million acres of land in-part spanning westward from near modern day Niagara-on-the-Lake along the south shore of Lake Ontario to modern day Burlington (Aboriginal Affairs and Northern Development Canada 2016).

1.2.3 Euro-Canadian Land Use: Township Survey and Settlement

Historically, the Study Area is located in the Former Township of Woodhouse, Norfolk County in Lot 16 & Concession 1.

The S & G stipulates that areas of early Euro-Canadian settlement (pioneer homesteads, isolated cabins, farmstead complexes), early wharf or dock complexes, pioneer churches, and early cemeteries are considered to have archaeological potential. Early historical transportation routes (trails, passes, roads, railways, portage routes), properties listed on a municipal register or designated under the *Ontario Heritage Act* or a federal, provincial, or municipal historic landmark or site are also considered to have archaeological potential.

For the Euro-Canadian period, the majority of early nineteenth century farmsteads (i.e., those that are arguably the most potentially significant resources and whose locations are rarely recorded on nineteenth century maps) are likely to be located in proximity to water. The development of the network of concession roads and railroads through the course of the nineteenth century frequently influenced the siting of farmsteads and businesses. Accordingly, undisturbed lands within 100 m of an early settlement road are also considered to have potential for the presence of Euro-Canadian archaeological sites.

The first Europeans to arrive in the area were transient merchants and traders from France and England, who followed Indigenous pathways and set up trading posts at strategic locations along the well-traveled river routes. All of these occupations occurred at sites that afforded both natural landfalls and convenient access, by means of the various waterways and overland trails, into the hinterlands. Early transportation routes followed existing Indigenous trails, both along the lakeshore and adjacent to various creeks and rivers (ASI 2006).

Port Dover

In the early 1800's, United Empire Loyalists began to settle this area. One man, named Daniel McQueen, erected a dam and mill near a ford of the River Lynn. This site became known as Dover Mills, or just Dover, after the English port of Dover. During the War of 1812, Port Dover was a supply centre and regular port of call for vessels of the British navy. Major General Sir Isaac Brock departed from Dover to relived Amherstburg which was under siege by the Americans forces. In 1814 the village was burned by American forces. The inhabitants slowly began to rebuild after the destruction and in 1832 a post office was opened.

After the opening of the Erie and Welland ship canals in 1825-30, shipping increased on Lake Erie and businessmen in Dover recognized the need for improved harbor facilities and work started in 1833. In 1842 the government assumed guardianship of the harbor and commenced dredging operations and the construction of piers and a light house. With the construction of the Hamilton and Port Dover Plank Road (Highway 6), inland connections were made with centres of lumbering and grain production. Grain and

timber exports from Port Dover peaked during 1850-1860. The construction of railroads inland, coupled with a natural decline in lumber took their toll on Port Dover's importance as a transport centre.

Port Dover was incorporated as a village in 1879 with a population of 1100. The village continued to grow largely due to the growth of the fishing industry. Port Dover became known for having the largest inland fishing fleet in the world.

Port Dover was incorporated as a town in 1954. In 1965 the town annex part of the Township of Woodhouse, and in 1974 it amalgamated with the town of Waterford and the village of Jarvis as the City of Nanticoke in the newly created Regional Municipality of Haldimand-Norfolk (Mika and Mika 1983:233–234).

Township of Woodhouse

Woodhouse township is located in the Talbot District, is bounded on the east by the township of Walpole, on the north by Townsend, on the west by Charlotteville, and on the south by Lake Erie. In 1846, 10,232 acres were under cultivation. Simcoe, the district town, Port Dover on Lake Erie, at the mouth of Patterson's Creek, and a small shipping place called Port Ryerse, were situated in the township. The historic plank road (now Highway 6) from Hamilton to Port Dover, passes through the township. In 1846 there were three grist and eleven saw mills in the township (Smith 1846).

1.2.4 Map Review

The 1856 *Tremaine Map of Norfolk* and the 1878 *Illustrated Atlas of the County of Norfolk* (Tremaine 1856; Page & Co. 1877) maps were examined to determine the presence of historic features within the Study Area during the nineteenth century (Table 1; Figures 2-3).

It should be noted, however, that not all features of interest were mapped systematically in the Ontario series of historical atlases, given that they were financed by subscription, and subscribers were given preference with regard to the level of detail provided on the maps. Moreover, not every feature of interest would have been within the scope of the atlases.

In addition, the use of historical map sources to reconstruct/predict the location of former features within the modern landscape generally proceeds by using common reference points between the various sources. These sources are then geo-referenced in order to provide the most accurate determination of the location of any property on historic mapping sources. The results of such exercises are often imprecise or even contradictory, as there are numerous potential sources of error inherent in such a process, including the vagaries of map production (both past and present), the need to resolve differences of scale and resolution, and distortions introduced by reproduction of the sources. To a large degree, the significance of such margins of error is dependent on the size of the feature one is attempting to plot, the constancy of reference points, the distances between them, and the consistency with which both they and the target feature are depicted on the period mapping.

Table 1: Nineteenth-century property owners and historical features within or adjacent to the Study Area

		1856 Tremaine		*1878 Illustrated Atlas*	
Con #	**Lot #**	**Property Owner(s)**	**Historical Feature(s)**	**Property Owner(s)**	**Historical Feature(s)**
1	16	E. Mink	Road and rail road	Chas. Moore	Road and rail road

According to the maps, the Study Area lands were owned by the Mink family in 1856 and in 1887, the portion that extends beyond the road allowance is owned by the Moore family. On both maps the historic Plank Road (now Highway 6) and the railway to the north are noted. The railway is more than 500 meters away from the current Study Area. On the 1865 map, no buildings or indications of land use are present on the Mink parcel. One building, the Moore farmstead, is noted on the southside of Highway 6 and away from the current Study Area.

The 1939 NTS Simcoe Sheet map (Department of National Defence 1939) was examined to determine the extent and nature of development and land uses within the Study Area (Figure 4). The map indicates that the Study Area is primarily within the road right-of-way (ROW) of Highway 6 and a structure is noted to the northwest and outside the Study Area.

A review of available Google satellite imagery shows that the Study Area has remained an active agricultural field since 2003. The aerial photos indicate the presence of tile drainage in the field as the patterns can be often be noted in the field starting in 2009. Construction on the subdivision on the opposite side of Highway 6 can be noted in 2016 and a new road which will eventually connect to the southern portion of the roundabout, outside of the Study Area, can be seen in 2018.

1.3 Archaeological Context

This section provides background research pertaining to previous archaeological fieldwork conducted within and in the vicinity of the Study Area, its environmental characteristics (including drainage, soils or surficial geology and topography, etc.), and current land use and field conditions. Three sources of information were consulted to provide information about previous archaeological research: the site record forms for registered sites available online from the MHSTCI through "Ontario's Past Portal"; published and unpublished documentary sources; and the files of ASI.

1.3.1 Geography

In addition to the known archaeological sites, the state of the natural environment is a helpful indicator of archaeological potential. Accordingly, a description of the physiography and soils are briefly discussed for the Study Area.

The S & G stipulates that primary water sources (lakes, rivers, streams, creeks, etc.), secondary water sources (intermittent streams and creeks, springs, marshes, swamps, etc.), ancient water sources (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, etc.), as well as accessible or inaccessible shorelines (high bluffs, swamp or marsh fields by the edge of a lake, sandbars stretching into marsh, etc.) are characteristics that indicate archaeological potential.

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. Since water sources have remained relatively stable in Ontario since 5,000 BP (Karrow and Warner 1990:Figure 2.16), proximity to water can be regarded as a useful index for the evaluation of archaeological site potential. Indeed, distance from water has been one of the most commonly used variables for predictive modeling of site location.

Other geographic characteristics that can indicate archaeological potential include: elevated topography (eskers, drumlins, large knolls, and plateaux), pockets of well-drained sandy soil, especially near areas of heavy soil or rocky ground, distinctive land formations 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 (migratory routes, spawning areas) are also considered characteristics that indicate archaeological potential (S & G, Section 1.3.1).

The Study Area is within the Haldimand Clay Plain physiographic region. The Haldimand Clay Plain (Chapman and Putnam 1984:156-159) is among the largest of the 53 defined physiographic regions in southern Ontario, comprising approximately 3,500 square km (MacDonald 1980:3). Generally, this region is flat and poorly drained, although it includes several distinctive landforms including dunes, cobble, clay, and sand beaches, limestone pavements, and back-shore wetland basins. Within this part of the Niagara peninsula, a number of environmental sub-regions have been described, including the Niagara Slough Clay Plain, the Fort Erie Clay Plain, the Calcareous Rock Plain (Onondaga Escarpment), the Buried Moraines, the Lake Erie Coast, and the Niagara River Valley (MacDonald 1980). The distribution and nature of these sub-regions, and the specific environmental features they contain, have influenced land use in the region throughout history and pre-history.

Figure 5 depicts surficial geology for the Study Area. The surficial geology mapping demonstrates that the Study Area is underlain by 15 - 40 cm of sandy textures over lacustrine silty clay (Ontario Geological Survey 2010). Soils in the Study Area consist of lacustrine silty clay and imperfectly drained soil (Figure 6).

The Study Area is located within one kilometre of the Lynn River and the shore of Lake Erie.

1.3.2 Previous Archaeological Research

In Ontario, information concerning archaeological sites is stored in the Ontario Archaeological Sites Database (OASD) maintained by the MHSTCI. This database contains archaeological sites registered within the Borden system. Under the Borden system, Canada has been divided into grid blocks based on latitude and longitude. A Borden block is approximately 13 km east to west, and approximately 18.5 km north to south. Each Borden block is referenced by a four-letter designator, and sites within a block are numbered sequentially as they are found. The Study Area under review is located in Borden block *AeHb*

According to the OASD, 21 previously registered archaeological sites are located within one kilometre of the Study Area (MHSTCI 2020). Two the registered sites are within 50 m of the Study Area. A summary of the sites is provided below.

Table 2: List of previously registered sites within one kilometre of the Study Area

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AeHa-172	PDN 4	Precontact Indigenous	Scatter	ARA 1986
AeHa-173	PDN 5	Precontact Indigenous	Scatter	ARA 1986
AeHa-192	PDN 81	Precontact Indigenous	Scatter	ARA 1986
AeHb-115	Taylor Davy	Precontact Indigenous	Scatter	MHCI 2011
AeHb-32	Vallee 1	Precontact Indigenous	Unknown	ARA 2004
AeHb-34	Southside 1	Precontact Indigenous	Scatter	MHCI 2006
AeHb-35	Southside 3	Precontact Indigenous	Scatter	MHCI 2006
AeHb-36	Southside 2	Precontact Indigenous	Findspot	MHCI 2006
AeHb-37	Southside 4	Precontact Indigenous	Scatter	MHCI 2006
AeHb-38	Southside 5	Precontact Indigenous	Scatter	MHCI 2006
AeHb-39	**Southside 6**	**Precontact Indigenous**	**Scatter**	**MHCI 2006**
AeHb-40	Spencer	Precontact Indigenous	Scatter	MHCI 2006
AeHb-41	Rachel	Precontact Indigenous	Scatter	MHCI 2006
AeHb-42	**Devin**	**Precontact Indigenous**	**Scatter**	**MHCI 2006**
AeHb-43	Jason	Precontact Indigenous	Scatter	MHCI 2006
AeHb-44	John	Precontact Indigenous	Scatter	MHCI 2006
AeHb-45	Stephie	Precontact Indigenous	Scatter	MHCI 2006
AeHb-47	Dale	Precontact Indigenous	Findspot	MHCI 2006
AeHb-48	Judy	Precontact Indigenous	Findspot	MHCI 2006
AeHb-49	Kenneth	Precontact Indigenous	Scatter	MHCI 2006
AeHb-50	Gordon	Precontact Indigenous	Findspot	MHCI 2006

Bolded sites are within 50m of the Study Area
ARA - Archaeological Research Associated Ltd.
MHCI – Mayer Heritage Consultants Inc.

According to the background research, three previous reports detail fieldwork within 50 m of the Study Area.

In 2006 Mayer Heritage Consultants Inc. conducted a Stage 1-2 assessment of the Southside Developments project in Port Dover (CIF:P040-133; Mayer Heritage Consultants Inc. 2006). This Study Area covers the current Study Area. Pedestrian survey at five metre intervals was conducted across the 170 hectare (ha) study area with the exception of three areas that were noted as low and wet or sloped and did not exhibit potential. In total, 54 sites were encountered and 12 sites were recommended for Stage 3 investigation. The closest sites to the current Study Area recommended for further work, AeHb-39 and AeHb-42 which are approximately 50 m away on the other side of Highway 6 (note: the scale bar on Mayer 2006 Figure 5 is incorrect). During the Stage 2 assessment site AeHb-39 consisted of four chert flakes and AeHb-42 consisted of 10 chert flakes all of the artifacts were found during pedestrian survey. Both sites were subsequently subjected to a Stage 3 site investigation. Eight test units were excavated and

20 artifacts were found for AeHb-39 and five units and 12 artifacts were recovered for AeHb-42; both sites were considered fully documented and no further work was recommended (P040, licensee's identification numbers are noted as 05-072:23 and 05-072:26 in the OASD). This report was not attached to the current Study Area EA documentation and the proponent was unaware that the previous assessment had been completed. ASI was advised to complete the fieldwork before winter weather set in and the existence of the 2006 MHCI report was only discovered after ASI's Stage 2 property survey was in progress.

In 2012 Archaeological Research Associates Ltd. conducted a Stage 1-2 of the Highway 6 Rehabilitation (PIFs: P007-377-2011 and P077-380-2011; ARA 2012), including parts of the current Study Area. The relevant portion of the project area noted that the Highway 6 ROW was extensively disturbed and did not have archaeological potential. A small strip of agricultural field adjacent to the ROW was subject to pedestrian survey at 5 m intervals (Maps 28 and 29). The entire project area was noted as not requiring any further work and should be considered free of archaeological concern.

1.3.3 Stage 1 Analysis of Archaeological Potential

The S & G, Section 1.3.1, lists criteria that are indicative of archaeological potential. The Study Area meets the following criteria indicative of archaeological potential:

- Previously identified archaeological sites (See Table 2)
- Early historic transportation routes (Plank Road/Highway 6); and
- Proximity to early settlements (Port Dover)

According to the S & G, Section 1.4 Standard 1e, no areas within a property containing locations listed or designated by a municipality can be recommended for exemption from further assessment unless the area can be documented as disturbed. The Municipal Heritage Register was consulted and no properties within the Study Area are Listed or Designated under the *Ontario Heritage Act*.

These criteria are indicative of potential for the identification of Indigenous and Euro-Canadian archaeological resources, depending on soil conditions and the degree to which soils have been subject to deep disturbance.

2.0 FIELD METHODS: PROPERTY INSPECTION

The Stage 2 property assessment was conducted under the field direction of Sean Heafner (R1253) on December 15, 2020 in accordance with the *Ontario Heritage Act* and the S & G, Section 2. During all periods of field assessment, weather and lighting conditions permitted good visibility and were in accordance with the S & G, Section 2.1, Standard 3. Photographs of all field conditions were taken (Plates 1-3), and the location and direction of each photograph is mapped in Figure 7.

The Stage 2 Study Area comprises approximately 1.72 ha of an active agricultural field and a portion of the Highway 6 ROW. The Highway 6 ROW (36.4 %, 0.62 ha) was previously assessed and noted as having no archaeological potential by ARA in 2012. The remainder of the Study Area was assessed as having archaeological potential and was subject to Stage 2 pedestrian survey at five m intervals (53.6 %, 0.92 ha). Prior to the initiation of the Stage 2 survey, the agricultural lands within the Study Area were prepared by the farmer in early December 2020 at the request of the Hatch Limited. A tractor and mould-

board plough were used to turn the soils over, and a disc attachment was used on the fields twice in alternating directions. The field preparation methods used meet the requirements of S & G Section 2.1.1, Standards 1-5 for pedestrian survey. All standards were met; ploughing was deep enough to provide total topsoil exposure, but not deeper than previous ploughing and weathering was excellent resulting in surface visibility greater than 80 % (Plates 1-3).

One poorly drained area was noted in the field with an area of standing water that made pedestrian survey impossible. However, it was subsequently determined that this area was previously assessed by Mayer Heritage Consultants in 2006. The 2006 assessment was completed before the current 2011 S & Gs were in place, however the assessment methodology used complies with the current S & G Section 2.1.1 and therefore does not require resurvey. As noted earlier, the 2006 report was not attached to the EA documentation and the proponent was unaware that any archaeological surveys had been conducted previously. ASI was advised to complete the fieldwork before the winter weather set in and the existence of the Mayer 2006 report was only noted after the Stage 2 fieldwork was in progress.

3.0 RECORD OF FINDS

No archaeological resources were recovered during the Stage 2 survey.

3.1 Documentary and Material Record

The documentation related to this archaeological assessment will be curated by ASI until such a time that arrangements for their ultimate transfer to Her Majesty the Queen in right of Ontario, or other public institution, can be made to the satisfaction of the project owner(s), the MHSTCI, and any other legitimate interest groups.

Table 3 provides an inventory and location of the documentary and material record for the project in accordance with the S & G, Sections 6.7 and 7.8.2.3.

Table 3: Inventory of Documentary and Material Record

Document/Material	Location	Comments
Written Field Notes, Annotated Field Maps, GPS Logs, etc.	Archaeological Services Inc., 528 Bathurst Street, Toronto, ON M5S 2P9	Field notes hard copy, GPS data (digital) [2 files]
Field Photography (Digital)	Archaeological Services Inc., 528 Bathurst Street, Toronto, ON M5S 2P9	Stored on ASI network servers [12 files]
Research/Analysis/Reporting Materials (Various Formats)	Archaeological Services Inc., 528 Bathurst Street, Toronto, ON M5S 2P9	Hard copy and/or digital files stored on ASI network servers [3 files]

4.0 ANALYSIS AND CONCLUSIONS

ASI was contracted by Hatch to conduct a combined Stage 1-2 Archaeological Assessment as part of the Highway 6 Roundabout project located in the Town of Port Dover, County of Norfolk. This project involves the design and construction of a traffic roundabout on Highway 6 that will service planned

residential subdivisions. The lands in question comprise 1.71 ha of active agricultural field and the ROW of Highway 6. The preliminary Stage 1 background research determined that the Study Area retained archaeological potential. Additional background research conducted after the Stage 2 fieldwork was in progress, uncovered a 2006 Mayer Heritage Stage 2 report documenting that the area has been previously assessed.

The Stage 2 property assessment was conducted between December 15, 2020 under the field direction of Sean Heafner (R1253) on December 15, 2020. Initial survey determined that a portion of the Study Area (36.4 %, 0.62 ha) was previously assessed by ARA in 2012 and it was noted as not having archaeological potential due to previous deep and extensive ground disturbance. The remainder of the Study Area was assessed as having archaeological potential (63 %, 1.09 ha) and was subject to Stage 2 pedestrian survey at 5 m intervals. One area (10 %, 0.17 ha) was not assessed due to standing water, but was however previously assessed by Mayer Heritage Consultants (2006) by pedestrian survey at 5 m intervals and no archaeological resources were identified. No archaeological resources were encountered during the course of ASI's Stage 2 assessment for the Highway 6 Roundabout and the Study Area can be considered free of archaeological concern.

5.0 RECOMMENDATIONS

In light of these results, the following recommendations are made:

1. The Highway 6 Roundabout Study Area does not require further archaeological assessment; and

2. Should changes to the project design or temporary workspace requirements result in the inclusion of previously un-surveyed lands, these lands should be subject to a Stage 2 archaeological assessment.

NOTWITHSTANDING the results and recommendations presented in this study, ASI notes that no archaeological assessment, no matter how thorough or carefully completed, can necessarily predict, account for, or identify every form of isolated or deeply buried archaeological deposit. In the event that archaeological remains are found during subsequent construction activities, the consultant archaeologist, approval authority, and the Archaeology Programs Unit of the MHSTCI should be immediately notified.

6.0 ADVICE ON COMPLIANCE WITH LEGISLATION

ASI also advises compliance with the following legislation:

- This report is submitted to the Ministry of Heritage, Sport, Tourism and Culture Industries as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, RSO 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological field work and report recommendations ensure the conservation, preservation and protection 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 Heritage, Sport, Tourism and Culture Industries, 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.

- 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 time as a licensed archaeologist has completed archaeological field work 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 Archaeology Reports referred to in Section 65.1 of the *Ontario Heritage Act.*

- 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 sec. 48 (1) of the *Ontario Heritage Act*.

- The *Cemeteries Act*, R.S.O. 1990 c. C.4 and the *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Government and Consumer Services.

- 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, nor may artifacts be removed from them, except by a person holding an archaeological license.

7.0 REFERENCES CITED

Aboriginal Affairs and Northern Development Canada
2016 Between the Lakes Purchase and Collins Purchase, No. 3. *Treaty Texts – Upper Canada Land Surrenders*. https://www.aadnc-aandc.gc.ca/eng/1370372152585/1370372222012#ucls5.

ARA, (Archaeological Research Associated Ltd.)
2012 *Stage 1 and 2 Archaeological Assessments Highway 6 Rehabilitation from Port Dover Northerly to the Jarvis South Limits GWP 3048-03-00 Geographic Townships of Woodhouse and Walpole Norfolk and Haldimand Counties, Ontario*. January 20.

ASI, (Archaeological Services Inc.)
2006 *Historical Overview and Assessment of Archaeological Potential Don River Watershed, City of Toronto*. Report on file with the Ontario Ministry of Heritage, Sport, Tourism and Culture Industries, Toronto.

Birch, J., and R. F. Williamson
2013 *The Mantle Site: An Archaeological History of an Ancestral Wendat Community*. Rowman & Littlefield Publishers, Inc., Latham.

Brown, J.
1995 On Mortuary Analysis – with Special Reference to the Saxe-Binford Research Program. In *Regional Approaches to Mortuary Analysis*, L. A. Beck, editor, pp. 3–23. Plenum Press, New York.

Chapman, L.J., and F. Putnam
1984 *The Physiography of Southern Ontario*. Vol. 2. Ontario Geologic Survey, Special Volume. Ontario Ministry of Natural Resources, Toronto.

Department of National Defence
1939 Simcoe Sheet.

Dodd, C. F., D. R. Poulton, P. A. Lennox, D. G. Smith, and G. A. Warrick
1990 The Middle Ontario Iroquoian Stage. In *The Archaeology of Southern Ontario to A.D. 1650*, C. J. Ellis and N. Ferris, editors, pp. 321–360. Occasional Publication of the London Chapter OAS Number 5. Ontario Archaeological Society Inc., London, ON.

Edwards, T.W.D., and P. Fritz
1988 Stable-Isotope Palaeoclimate Records from Southern Ontario, Canada: Comparison of Results from Marl and Wood. *Canadian Journal of Earth Sciences* 25:1397–1406.

Ellis, C. J., and D. B. Deller
1990 Paleo-Indians. In *The Archaeology of Southern Ontario to A.D. 1650*, C. J. Ellis and N. Ferris, editors, pp. 37–64. Occasional Publication of the London Chapter OAS Number 5. Ontario Archaeological Society Inc., London, ON.

Ellis, C. J., I. T. Kenyon, and M. W. Spence
1990 The Archaic. In *The Archaeology of Southern Ontario to A.D. 1650*, C. J. Ellis and N. Ferris, editors, pp. 65–124. Occasional Publication of the London Chapter OAS Number 5.

Ontario Archaeological Society Inc., London, ON.

Ellis, C. J., P. A. Timmins, and H. Martelle
2009 At the Crossroads and Periphery: The Archaic Archaeological Record of Southern Ontario. In *Archaic Societies: Diversity and Complexity across the Midcontinent.*, T. D. Emerson, D. L. McElrath, and A. C. Fortier, editors, pp. 787–837. State University of New York Press, Albany, New York.

Ferris, N.
2013 Place, Space, and Dwelling in the Late Woodland. In *Before Ontario: The Archaeology of a Province*, pp. 99–111. McGill-Queen's University Press. http://www.jstor.org/stable/j.ctt32b7n5.15.

Johnston, C. E.
1964 *The Valley of the Six Nations: A Collection of Documents on the Indian Lands of the Grand River*. The Champlain Society, Toronto, Ontario.

Karrow, P.F., and B.G. Warner
1990 The Geological and Biological Environment for Human Occupation in Southern Ontario. In *The Archaeology of Ontario to A.D. 1650*, pp. 5–36. Occasional Publications 5. London Chapter, Ontario Archaeological Society, London.

Lytwyn, V. P.
2005 *Historical Research Report: Aboriginal Settlement and Use of the North Pickering Development Planning Area and Adjacent Lands, 1690-1923.*

MacDonald, I.D.
1980 *Life Science Features of the Haldimand Clay Plain Physiographic Region*. Ontario Ministry of Natural Resources, Parks and Recreation Section, Central Region, Richmond Hill.

Mayer Heritage Consultants Inc.
2006 *Archaeological Assessment (Stages 1 and 2) Southside Developments, Town of Port Dover, R. M. of Haldimand-Norfolk, Ontario*. P040-133. May.

MHSTCI, (Ministry of Heritage, Sport, Tourism and Culture Industries)
1990 *Ontario Heritage Act, R.S.O. 1990, c. O.18 [as Amended in 2019].*

2020 Ontario's Past Portal. *PastPortal*. https://www.pastport.mtc.gov.on.ca.

Mika, N., and H. Mika
1983 *Places In Ontario: Their Name Origins and History, Part III, N-Z*. Mika Publishing Company, Belleville.

Ministry of the Environment
1990 Environmental Assessment Act, R.S.O. Province of Ontario.

Ministry of Tourism and Culture
2011 *Standards and Guidelines for Consultant Archaeologists*. Cultural Programs Branch,

Ontario Ministry of Tourism and Culture, Toronto.

Municipal Engineers Association
2000 *Municipal Class Environmental Assessment, Last Amended 2015*.

Ontario Geological Survey
2010 Surficial Geology of Southern Ontario. Miscellaneous Release — Data 128 – Revised. http://www.geologyontario.mndm.gov.on.ca/mndmaccess/mndm_dir.asp?type=pub&id=MRD128-REV.

Page & Co.
1877 Illustrated Historical Atlas of the Counties of Haldimand and Norfolk. Toronto.

Rogers, Edward S.
1962 *The Round Lake Ojibwa*. Royal Ontario Museum.

Smith, W.H.
1846 *Smith's Canadian Gazetteer, Comprising Statistical and General Information Respecting All Parts of the Upper Province, or Canada West*. H. & W. Rowsell, Toronto.

Spence, M. W., R. H. Pihl, and C. Murphy
1990 Cultural Complexes of the Early and Middle Woodland Periods. In *The Archaeology of Southern Ontario to A.D. 1650*, C. J. Ellis and N. Ferris, editors, Occasional Publication of the London Chapter OAS Number 5. Ontario Archaeological Society Inc., London.

Tremaine, G.C
1856 Map of the County of Norfolk. Kingston, Ontario.

Williamson, R. F.
1990 The Early Iroquoian Period of Southern Ontario. In *The Archaeology of Southern Ontario to A.D. 1650*, C. J. Ellis and N. Ferris, editors, pp. 291–320. Occasional Publication of the London Chapter OAS Number 5. Ontario Archaeological Society Inc., London.

8.0 MAPS

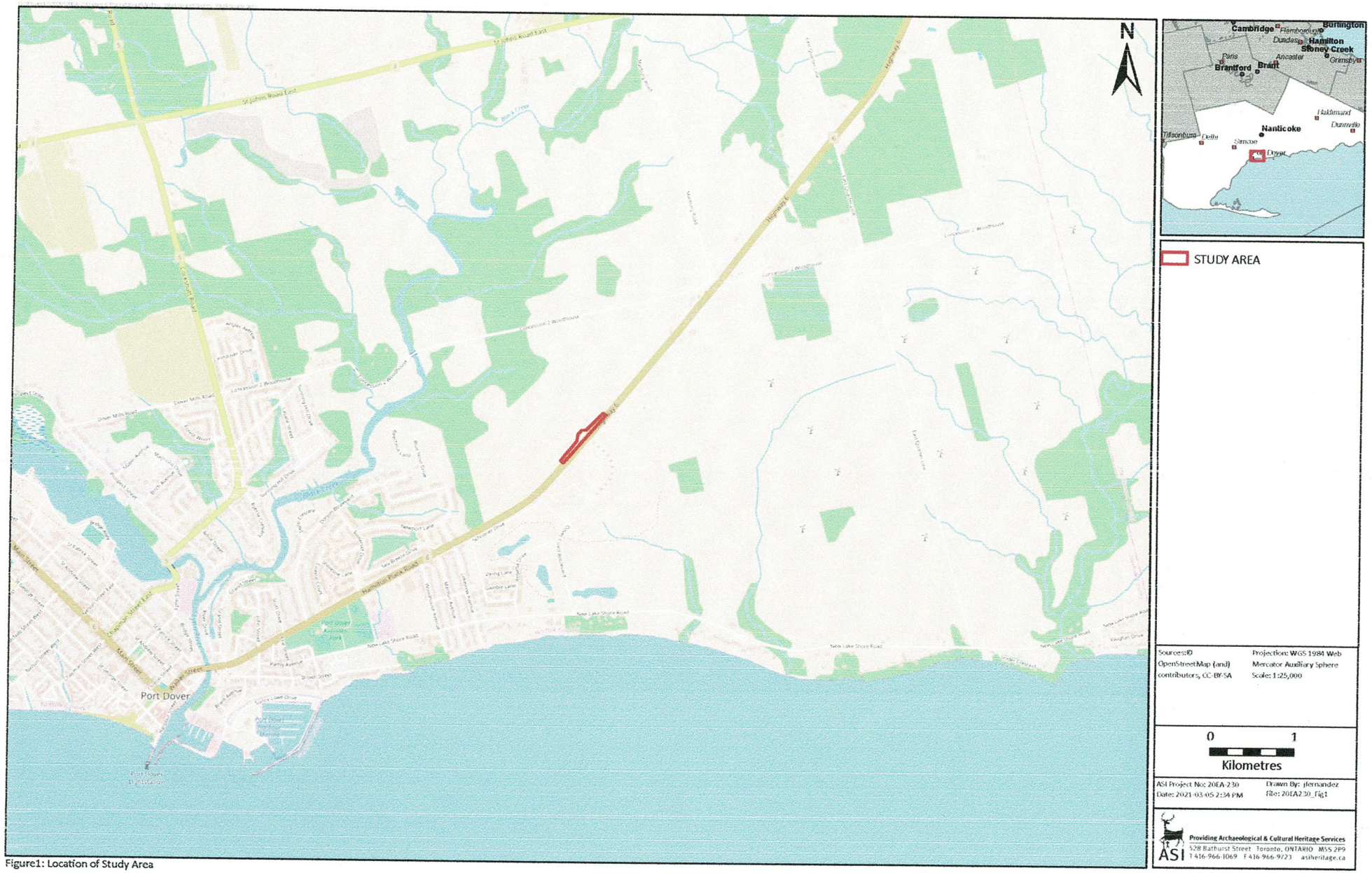

Figure1: Location of Study Area

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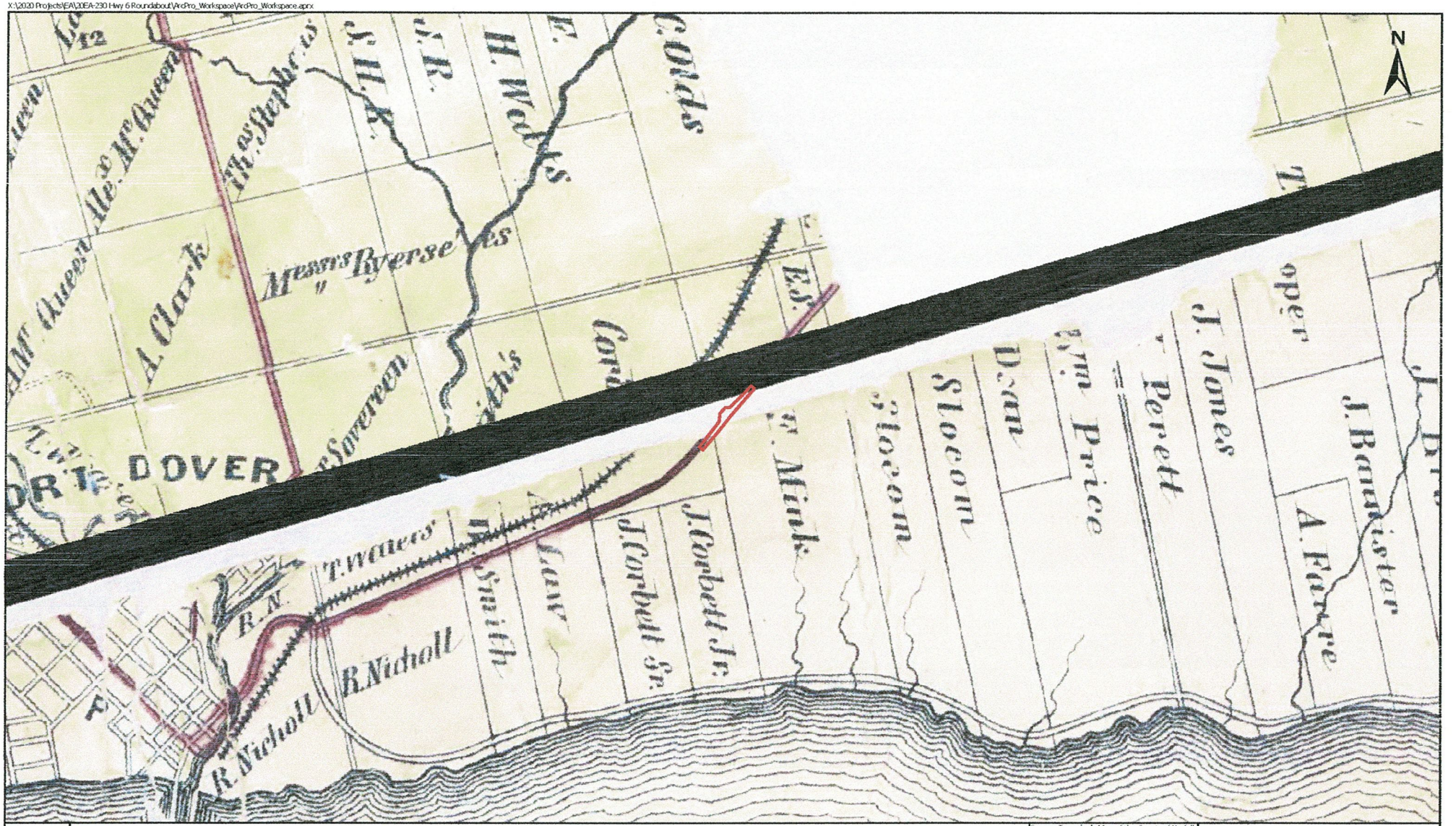

Figure 2: Study Area Located on the 1856 Tremaine Map of Norfolk

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STUDY AREA

Source: Illustrated Historic Atlas for the County of Norfolk, Woodhouse Sheet (1878)

Projection: NAD 1983 UTM Zone 17N
Scale: 1:15,000
Page Size: 11 x 17

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Metres

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File: 11x17_HistAtlas

Figure 3: Study Area Located on the 1878 Illustrated Atlas of the County of Norfolk

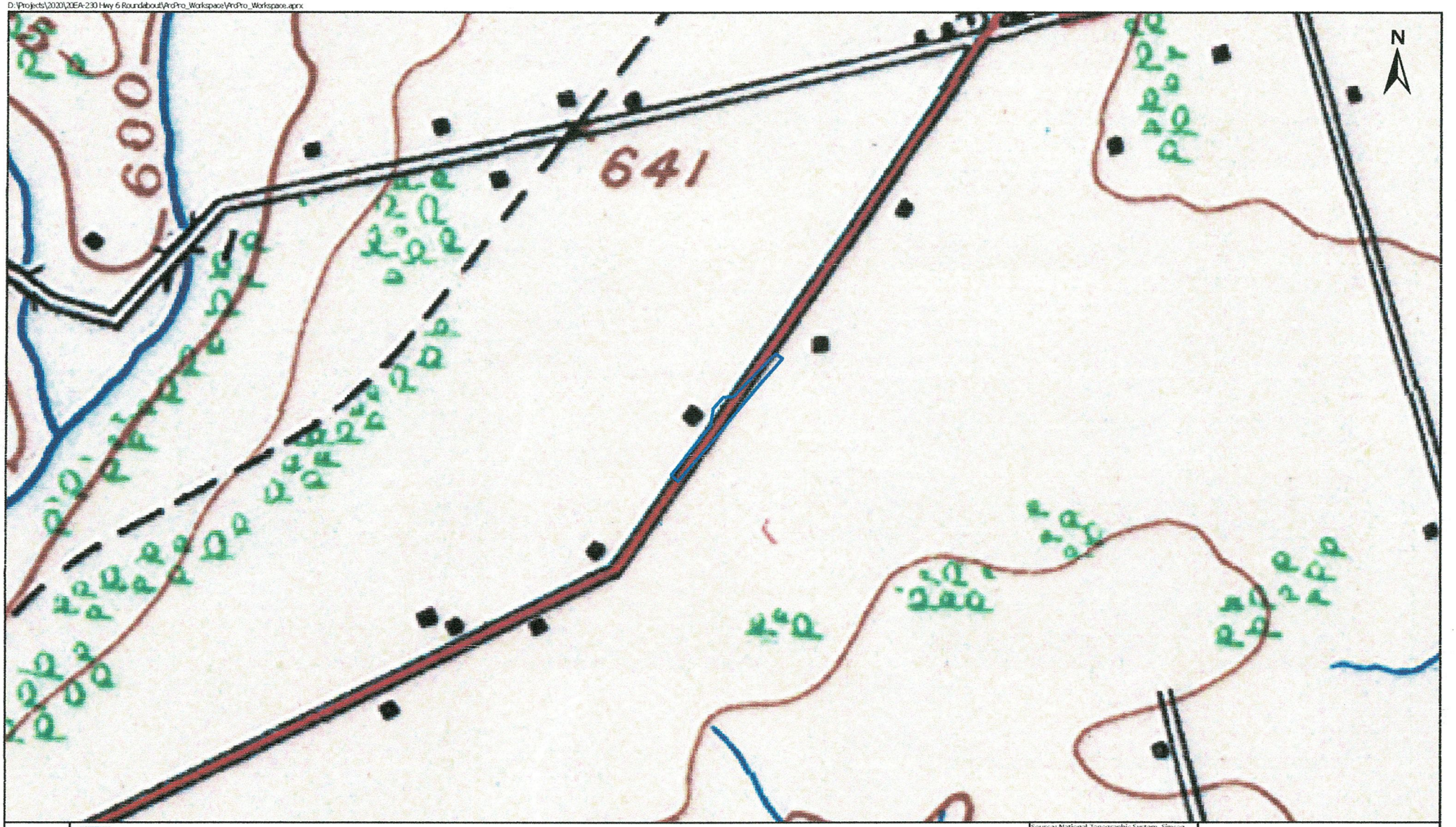

Figure 4: Study Area Located on the 1939 NTS, Simcoe Sheet

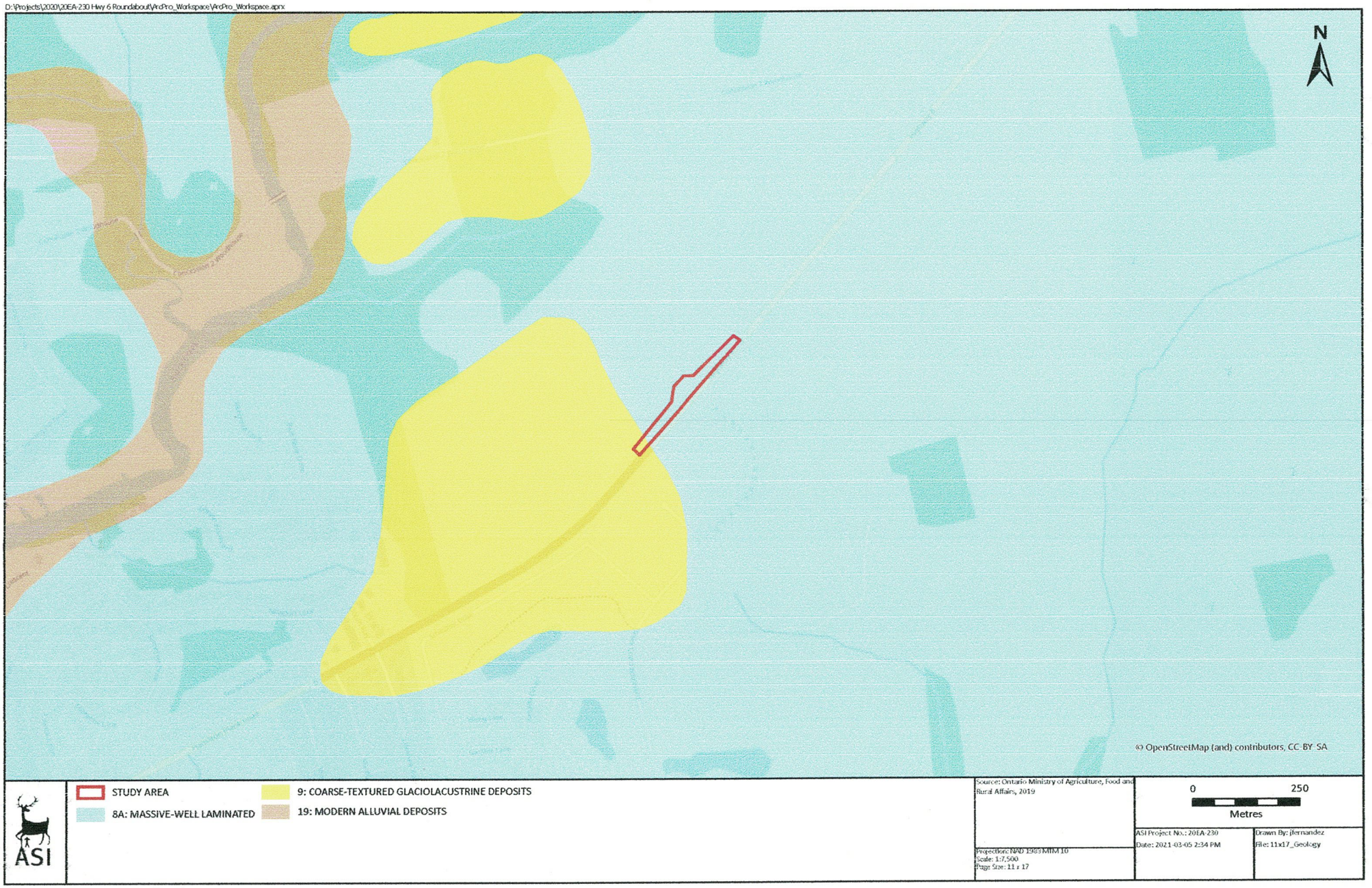

Figure 5: Study Area - Surficial Geology

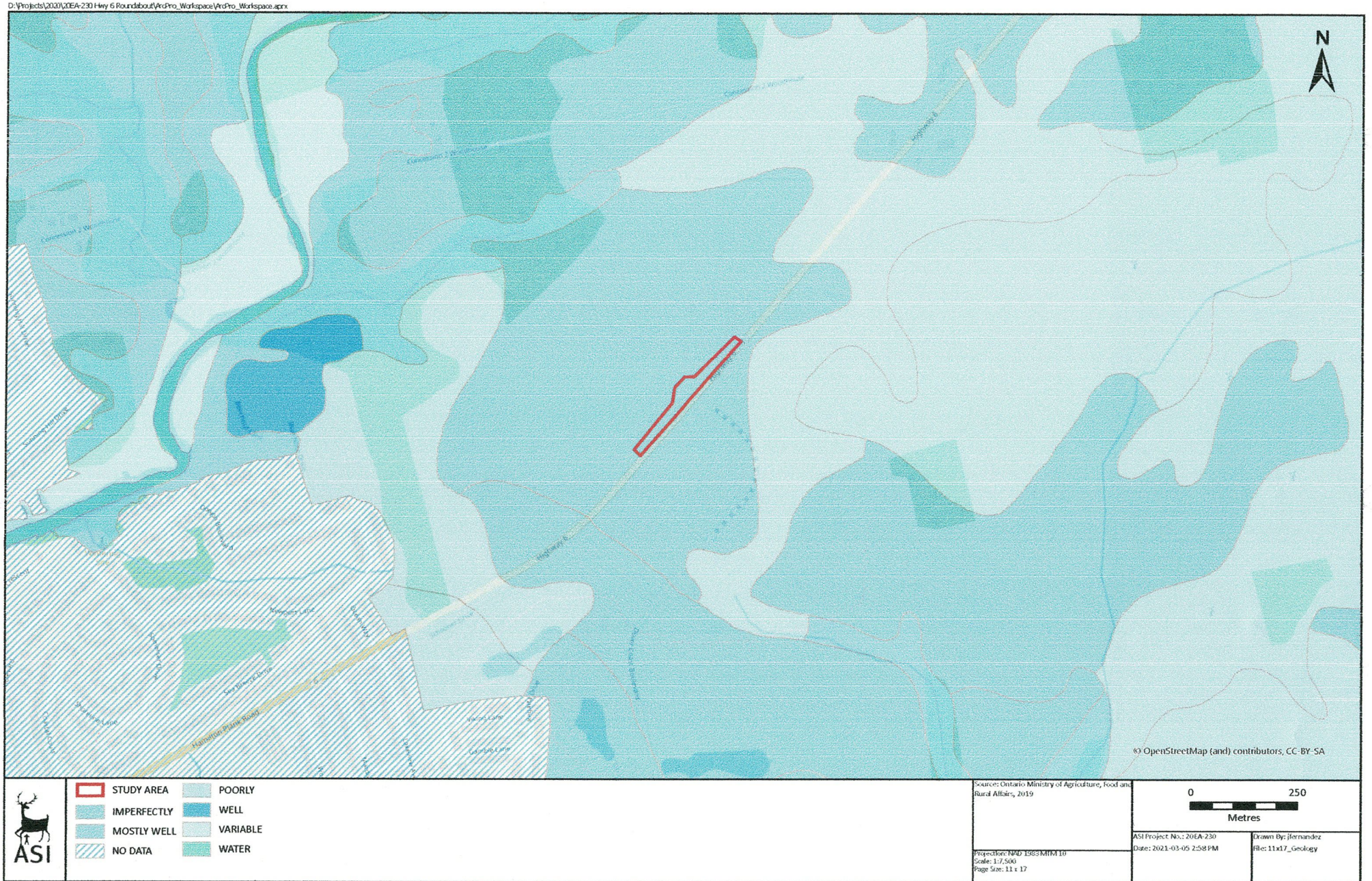

Figure 6: Study Area - Soil Drainage

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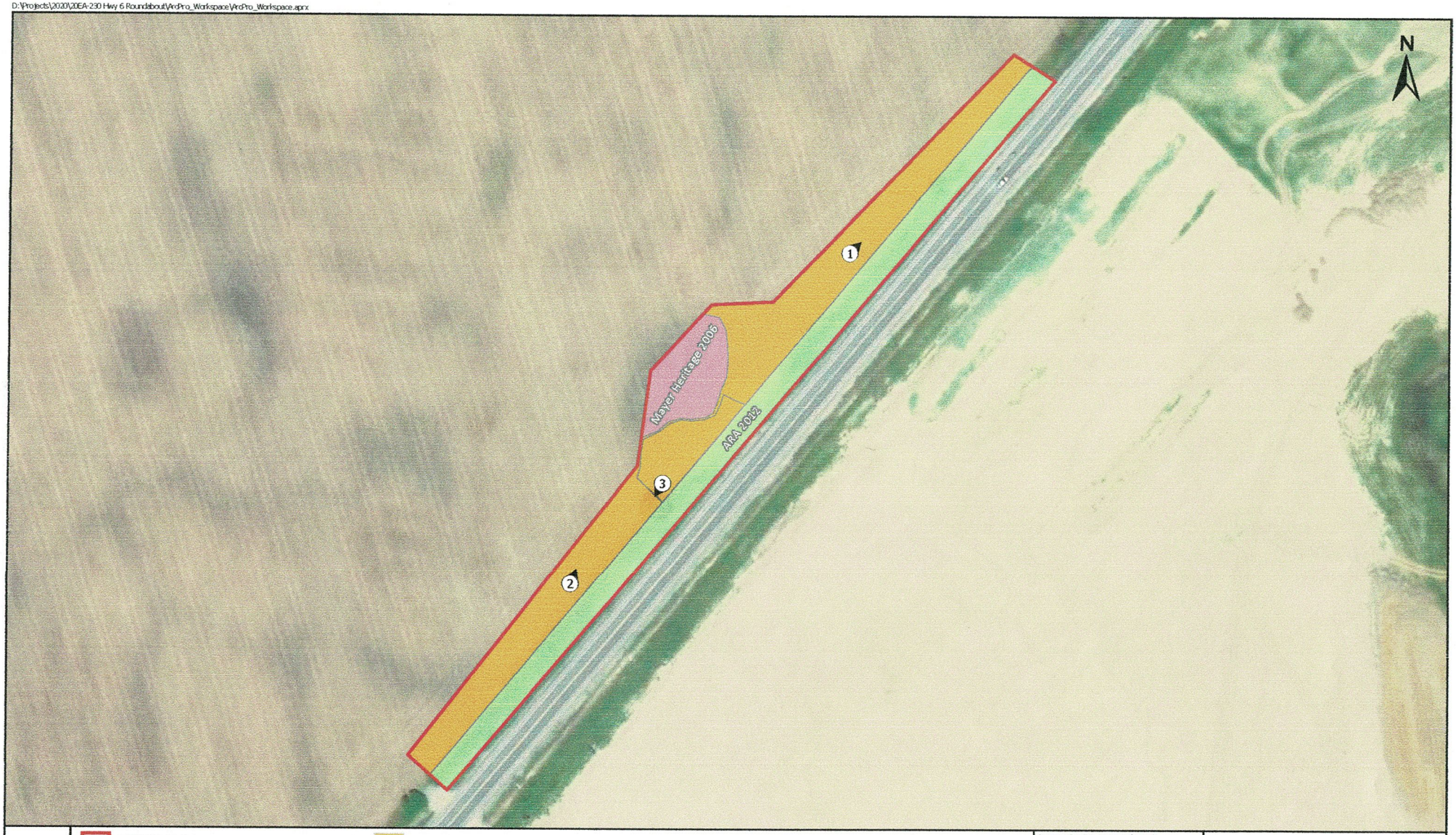

ASI

STUDY AREA

PHOTO LOCATION AND DIRECTION

PEDESTRIAN SURVEY AT 5 M INTERVALS

PREVIOUSLY ASSESSED: NO ARCHAEOLOGICAL POTENTIAL

PREVIOUSLY ASSESSED: NO FURTHER WORK REQUIRED

Sources: GeoEye, Maxar, Microsoft

Projection: NAD 1983 UTM Zone 17N
Scale: 1:1,300
Page Size: 11 x 17

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Figure 7: Stage 2 Results

9.0 IMAGES

Plate 1: Field conditions at the time of pedestrian survey

Plate 2: Pedestrian survey at 5 m intervals in progress

Plate 3: Pedestrian survey at 5 m intervals in progress

STAGE 1-2 ARCHAEOLOGICAL ASSESSMENT
HIGHWAY 6 ROUNDABOUT
PART OF LOT 16, CONCESSION 1
(FORMER TOWNSHIP OF WOODHOUSE)
COUNTY OF NORFOLK, ONTARIO

ORIGINAL REPORT

Prepared for:

Hatch Limited
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Mississauga, ON L5K 2R7
T 289-326-1312

Archaeological Licence #P383 (Williams)
Ministry of Heritage, Sport, Tourism and Culture Industries PIF# P383-0242-2020
ASI File: 20EA-230

4 June 2021

ASI Providing Archaeological & Cultural Heritage Services
528 Bathurst Street Toronto, ONTARIO M5S 2P9
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Stage 1-2 Archaeological Assessment
Highway 6 Roundabout
Part of Lot 16, Concession 1
(Former Township of Woodhouse)
County of Norfolk, Ontario

EXECUTIVE SUMMARY

Archaeological Services Inc (ASI) was contracted by Hatch Limited to conduct a combined Stage 1-2 Archaeological Assessment (Background Research and Property Inspection) as part of the Highway 6 Roundabout in the County of Norfolk. This project involves the design and construction of a traffic roundabout on Highway 6 that will service planned residential subdivisions.

While the Stage 2 property survey was still in progress, background research determined that the lands had been previously assessed by Mayer Heritage Consultant Inc. in 2006. ASI's Stage 2 pedestrian survey did not encounter any archaeological resources. A small area that ASI was unable to assess in 2020 has been determined to be previously assessed by Mayer Heritage Consultants Inc. in 2006 by pedestrian survey at 5 m intervals. No archaeological sites were noted in this area during the previous assessment. The Study Area for the Highway 6 Roundabout project can be considered free of archaeological concern and no further assessment is required.

PROJECT PERSONNEL

Senior Project Manager:	Lisa Merritt, MSc. (P094) *Partner / Director* *Environmental Assessment Division*
Project Coordinator:	Hannah Brouwers, Hon. BA (R1270) *Archaeologist / Project Administrator* *Environmental Assessment Division*
	Katrina Thach, Hon. BA (R1225) *Archaeologist / Project Coordinator* *Environmental Assessment Division*
Project Director (Licensee) and Project Manager:	Blake Williams, MLitt (P383) *Lead Archaeologist / Project Manager* *Environmental Assessment Division*
Field Director:	Sean Heafner, BSc (R1253) *Field Director* *Environmental Assessment Division*
Field Archaeologist:	Doug Todd (R055) *Associate Archaeologist / Analyst – Laboratory and Fieldwork Services, Operations Division*
Report Preparation:	Blake Williams
Graphics:	Robin Latour, MPhil, PDip *Associate Archaeologist / Geomatics Specialist* *Operations Division*
Report Review:	Eliza Brandy, MA (R1109) *Associate Archaeologist / Project Manager* *Environmental Assessment Division*
	Lisa Merritt

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1.0 PROJECT CONTEXT

Archaeological Services Inc. (ASI) was contracted by Hatch Limited to conduct a combined Stage 1-2 Archaeological Assessment (Background Research and Property Inspection) as part of the Highway 6 Roundabout in the County of Norfolk (Figure 1). This project involves the design and construction of a traffic roundabout on Highway 6 that will service planned residential subdivisions.

All activities carried out during this assessment were completed in accordance with the *Ontario Heritage Act* (1990, as amended in 2018) and the 2011 *Standards and Guidelines for Consultant Archaeologists* (S & G), administered by the Ministry of Tourism, Culture and Sport (MTCS 2011; now administered by the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI)).

1.1 Development Context

All work has been undertaken as required by the *Environmental Assessment Act*, RSO (Ministry of the Environment 1990 as amended 2010) and regulations made under the Act, and are therefore subject to all associated legislation. This project is being conducted in accordance with the Municipal Engineers' Association document *Municipal Class Environmental Assessment* (2000 as amended in 2007, 2011 and 2015).

ASI has been actively engaging with Indigenous communities who have expressed an interest in the archaeological work within the Study Area for this project on behalf of the Ontario Ministry of Transportation. A detailed account of all Indigenous engagement can be found in the *Supplementary Documentation (SD): Indigenous Engagement* document associated with this report.

Authorization to carry out the activities necessary for the completion of the Stage 1-2 archaeological assessment was granted by Hatch Limited on November 30, 2020.

1.2 Historical Context

The purpose of this section, according to the S & G, Section 7.5.7, Standard 1, is to describe the past and present land use and the settlement history and any other relevant historical information pertaining to the Study Area. A summary is first presented of the current understanding of the Indigenous land use of the Study Area. This is then followed by a review of the historical Euro-Canadian settlement history.

1.2.1 Indigenous Land Use and Settlement

Southern Ontario has been occupied by human populations since the retreat of the Laurentide glacier approximately 13,000 years before present (BP) (Ferris 2013). Populations at this time would have been highly mobile, inhabiting a boreal-parkland similar to the modern sub-arctic. By approximately 10,000 BP, the environment had progressively warmed (Edwards and Fritz 1988) and populations now occupied less extensive territories (Ellis and Deller 1990).

Between approximately 10,000-5,500 BP, the Great Lakes basins experienced low-water levels, and many sites which would have been located on those former shorelines are now submerged. This period produces the earliest evidence of heavy wood working tools, an indication of greater investment of labour in felling

trees for fuel, to build shelter, and watercraft production. These activities suggest prolonged seasonal residency at occupation sites. Polished stone and native copper implements were being produced by approximately 8,000 BP; the latter was acquired from the north shore of Lake Superior, evidence of extensive exchange networks throughout the Great Lakes region. The earliest evidence for cemeteries dates to approximately 4,500-3,000 BP and is indicative of increased social organization, investment of labour into social infrastructure, and the establishment of socially prescribed territories (Ellis et al. 1990; Ellis et al. 2009; Brown 1995:13).

Between 3,000-2,500 BP, populations continued to practice residential mobility and to harvest seasonally available resources, including spawning fish. The Woodland period begins around 2,500 BP and exchange and interaction networks broaden at this time (Spence et al. 1990:136, 138) and by approximately 2,000 BP, evidence exists for small community camps, focusing on the seasonal harvesting of resources (Spence et al. 1990:155, 164). By 1,500 BP there is macro botanical evidence for maize in southern Ontario, and it is thought that maize only supplemented people's diet. There is earlier phytolithic evidence for maize in central New York State by 2,300 BP - it is likely that once similar analyses are conducted on Ontario ceramic vessels of the same period, the same evidence will be found (Birch and Williamson 2013:13–15). As is evident in detailed Anishinaabek ethnographies, winter was a period during which some families would depart from the larger group as it was easier to sustain smaller populations (Rogers 1962). It is generally understood that these populations were Algonquian-speakers during these millennia of settlement and land use.

From the beginning of the Late Woodland period at approximately 1,000 BP, lifeways became more similar to that described in early historical documents. Between approximately 1000-1300 Common Era (CE), the communal site is replaced by the village focused on horticulture. Seasonal disintegration of the community for the exploitation of a wider territory and more varied resource base was still practised (Williamson 1990:317). By 1300-1450 CE, this episodic community disintegration was no longer practised and populations now communally occupied sites throughout the year (Dodd et al. 1990:343). From 1450-1649 CE this process continued with the coalescence of these small villages into larger communities (Birch and Williamson 2013). Through this process, the socio-political organization of the First Nations, as described historically by the French and English explorers who first visited southern Ontario, was developed.

By 1600 CE, the Huron- Wendat communities within Simcoe County had formed the Confederation of Nations encountered by the first European explorers and missionaries. Samuel de Champlain in 1615 reported that a group of Iroquoian-speaking people situated between the Haudenosaunee and the Huron-Wendat were at peace and remained "la nation neutre". Like the Huron-Wendat, Petun, and Haudenosaunee, the Neutral people were settled village agriculturalists. In the 1640s, the Neutral and the Huron-Wendat (and their Algonquian allies such as the Nippissing and Odawa) were decimated by epidemics and ultimately dispersed by the Haudenosaunee. Shortly afterwards, the Haudenosaunee established a series of settlements at strategic locations along the trade routes inland from the north shore of Lake Ontario. By the 1690s however, the Anishinaabeg were the only communities with a permanent presence in southern Ontario. From the beginning of the eighteenth century to the assertion of British sovereignty in 1763, there was no interruption to Anishinaabeg control and use of southern Ontario.

1.2.2 Treaties

The Study Area is within Treaty 3, the Between the Lakes Purchase. Following the 1764 Niagara Peace Treaty and the follow-up treaties with Pontiac, the English colonial government considered the Mississaugas to be their allies since they had accepted the Covenant Chain. The English administrators

followed the terms of the Royal Proclamation and insured that no settlements were made in the hunting grounds that had been reserved for their use (Johnston 1964; Lytwyn 2005). In 1784, under the terms of the "Between the Lakes Purchase" signed by Sir Frederick Haldimand and the Mississaugas, the Crown acquired over one million acres of land in-part spanning westward from near modern day Niagara-on-the-Lake along the south shore of Lake Ontario to modern day Burlington (Aboriginal Affairs and Northern Development Canada 2016).

1.2.3 Euro-Canadian Land Use: Township Survey and Settlement

Historically, the Study Area is located in the Former Township of Woodhouse, Norfolk County in Lot 16 & Concession 1.

The S & G stipulates that areas of early Euro-Canadian settlement (pioneer homesteads, isolated cabins, farmstead complexes), early wharf or dock complexes, pioneer churches, and early cemeteries are considered to have archaeological potential. Early historical transportation routes (trails, passes, roads, railways, portage routes), properties listed on a municipal register or designated under the *Ontario Heritage Act* or a federal, provincial, or municipal historic landmark or site are also considered to have archaeological potential.

For the Euro-Canadian period, the majority of early nineteenth century farmsteads (i.e., those that are arguably the most potentially significant resources and whose locations are rarely recorded on nineteenth century maps) are likely to be located in proximity to water. The development of the network of concession roads and railroads through the course of the nineteenth century frequently influenced the siting of farmsteads and businesses. Accordingly, undisturbed lands within 100 m of an early settlement road are also considered to have potential for the presence of Euro-Canadian archaeological sites.

The first Europeans to arrive in the area were transient merchants and traders from France and England, who followed Indigenous pathways and set up trading posts at strategic locations along the well-traveled river routes. All of these occupations occurred at sites that afforded both natural landfalls and convenient access, by means of the various waterways and overland trails, into the hinterlands. Early transportation routes followed existing Indigenous trails, both along the lakeshore and adjacent to various creeks and rivers (ASI 2006).

Port Dover

In the early 1800's, United Empire Loyalists began to settle this area. One man, named Daniel McQueen, erected a dam and mill near a ford of the River Lynn. This site became known as Dover Mills, or just Dover, after the English port of Dover. During the War of 1812, Port Dover was a supply centre and regular port of call for vessels of the British navy. Major General Sir Isaac Brock departed from Dover to relived Amherstburg which was under siege by the Americans forces. In 1814 the village was burned by American forces. The inhabitants slowly began to rebuild after the destruction and in 1832 a post office was opened.

After the opening of the Erie and Welland ship canals in 1825-30, shipping increased on Lake Erie and businessmen in Dover recognized the need for improved harbor facilities and work started in 1833. In 1842 the government assumed guardianship of the harbor and commenced dredging operations and the construction of piers and a light house. With the construction of the Hamilton and Port Dover Plank Road (Highway 6), inland connections were made with centres of lumbering and grain production. Grain and

timber exports from Port Dover peaked during 1850-1860. The construction of railroads inland, coupled with a natural decline in lumber took their toll on Port Dover's importance as a transport centre.

Port Dover was incorporated as a village in 1879 with a population of 1100. The village continued to grow largely due to the growth of the fishing industry. Port Dover became known for having the largest inland fishing fleet in the world.

Port Dover was incorporated as a town in 1954. In 1965 the town annex part of the Township of Woodhouse, and in 1974 it amalgamated with the town of Waterford and the village of Jarvis as the City of Nanticoke in the newly created Regional Municipality of Haldimand-Norfolk (Mika and Mika 1983:233–234).

Township of Woodhouse

Woodhouse township is located in the Talbot District, is bounded on the east by the township of Walpole, on the north by Townsend, on the west by Charlotteville, and on the south by Lake Erie. In 1846, 10,232 acres were under cultivation. Simcoe, the district town, Port Dover on Lake Erie, at the mouth of Patterson's Creek, and a small shipping place called Port Ryerse, were situated in the township. The historic plank road (now Highway 6) from Hamilton to Port Dover, passes through the township. In 1846 there were three grist and eleven saw mills in the township (Smith 1846).

1.2.4 Map Review

The 1856 *Tremaine Map of Norfolk* and the 1878 *Illustrated Atlas of the County of Norfolk* (Tremaine 1856; Page & Co. 1877) maps were examined to determine the presence of historic features within the Study Area during the nineteenth century (Table 1; Figures 2-3).

It should be noted, however, that not all features of interest were mapped systematically in the Ontario series of historical atlases, given that they were financed by subscription, and subscribers were given preference with regard to the level of detail provided on the maps. Moreover, not every feature of interest would have been within the scope of the atlases.

In addition, the use of historical map sources to reconstruct/predict the location of former features within the modern landscape generally proceeds by using common reference points between the various sources. These sources are then geo-referenced in order to provide the most accurate determination of the location of any property on historic mapping sources. The results of such exercises are often imprecise or even contradictory, as there are numerous potential sources of error inherent in such a process, including the vagaries of map production (both past and present), the need to resolve differences of scale and resolution, and distortions introduced by reproduction of the sources. To a large degree, the significance of such margins of error is dependent on the size of the feature one is attempting to plot, the constancy of reference points, the distances between them, and the consistency with which both they and the target feature are depicted on the period mapping.

Table 1: Nineteenth-century property owners and historical features within or adjacent to the Study Area

		1856 Tremaine		*1878 Illustrated Atlas*	
Con #	**Lot #**	**Property Owner(s)**	**Historical Feature(s)**	**Property Owner(s)**	**Historical Feature(s)**
1	16	E. Mink	Road and rail road	Chas. Moore	Road and rail road

According to the maps, the Study Area lands were owned by the Mink family in 1856 and in 1887, the portion that extends beyond the road allowance is owned by the Moore family. On both maps the historic Plank Road (now Highway 6) and the railway to the north are noted. The railway is more than 500 meters away from the current Study Area. On the 1865 map, no buildings or indications of land use are present on the Mink parcel. One building, the Moore farmstead, is noted on the southside of Highway 6 and away from the current Study Area.

The 1939 NTS Simcoe Sheet map (Department of National Defence 1939) was examined to determine the extent and nature of development and land uses within the Study Area (Figure 4). The map indicates that the Study Area is primarily within the road right-of-way (ROW) of Highway 6 and a structure is noted to the northwest and outside the Study Area.

A review of available Google satellite imagery shows that the Study Area has remained an active agricultural field since 2003. The aerial photos indicate the presence of tile drainage in the field as the patterns can be often be noted in the field starting in 2009. Construction on the subdivision on the opposite side of Highway 6 can be noted in 2016 and a new road which will eventually connect to the southern portion of the roundabout, outside of the Study Area, can be seen in 2018.

1.3 Archaeological Context

This section provides background research pertaining to previous archaeological fieldwork conducted within and in the vicinity of the Study Area, its environmental characteristics (including drainage, soils or surficial geology and topography, etc.), and current land use and field conditions. Three sources of information were consulted to provide information about previous archaeological research: the site record forms for registered sites available online from the MHSTCI through "Ontario's Past Portal"; published and unpublished documentary sources; and the files of ASI.

1.3.1 Geography

In addition to the known archaeological sites, the state of the natural environment is a helpful indicator of archaeological potential. Accordingly, a description of the physiography and soils are briefly discussed for the Study Area.

The S & G stipulates that primary water sources (lakes, rivers, streams, creeks, etc.), secondary water sources (intermittent streams and creeks, springs, marshes, swamps, etc.), ancient water sources (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, etc.), as well as accessible or inaccessible shorelines (high bluffs, swamp or marsh fields by the edge of a lake, sandbars stretching into marsh, etc.) are characteristics that indicate archaeological potential.

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. Since water sources have remained relatively stable in Ontario since 5,000 BP (Karrow and Warner 1990:Figure 2.16), proximity to water can be regarded as a useful index for the evaluation of archaeological site potential. Indeed, distance from water has been one of the most commonly used variables for predictive modeling of site location.

Other geographic characteristics that can indicate archaeological potential include: elevated topography (eskers, drumlins, large knolls, and plateaux), pockets of well-drained sandy soil, especially near areas of heavy soil or rocky ground, distinctive land formations 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 (migratory routes, spawning areas) are also considered characteristics that indicate archaeological potential (S & G, Section 1.3.1).

The Study Area is within the Haldimand Clay Plain physiographic region. The Haldimand Clay Plain (Chapman and Putnam 1984:156-159) is among the largest of the 53 defined physiographic regions in southern Ontario, comprising approximately 3,500 square km (MacDonald 1980:3). Generally, this region is flat and poorly drained, although it includes several distinctive landforms including dunes, cobble, clay, and sand beaches, limestone pavements, and back-shore wetland basins. Within this part of the Niagara peninsula, a number of environmental sub-regions have been described, including the Niagara Slough Clay Plain, the Fort Erie Clay Plain, the Calcareous Rock Plain (Onondaga Escarpment), the Buried Moraines, the Lake Erie Coast, and the Niagara River Valley (MacDonald 1980). The distribution and nature of these sub-regions, and the specific environmental features they contain, have influenced land use in the region throughout history and pre-history.

Figure 5 depicts surficial geology for the Study Area. The surficial geology mapping demonstrates that the Study Area is underlain by 15 - 40 cm of sandy textures over lacustrine silty clay (Ontario Geological Survey 2010). Soils in the Study Area consist of lacustrine silty clay and imperfectly drained soil (Figure 6).

The Study Area is located within one kilometre of the Lynn River and the shore of Lake Erie.

1.3.2 Previous Archaeological Research

In Ontario, information concerning archaeological sites is stored in the Ontario Archaeological Sites Database (OASD) maintained by the MHSTCI. This database contains archaeological sites registered within the Borden system. Under the Borden system, Canada has been divided into grid blocks based on latitude and longitude. A Borden block is approximately 13 km east to west, and approximately 18.5 km north to south. Each Borden block is referenced by a four-letter designator, and sites within a block are numbered sequentially as they are found. The Study Area under review is located in Borden block *AeHb*

According to the OASD, 21 previously registered archaeological sites are located within one kilometre of the Study Area (MHSTCI 2020). Two the registered sites are within 50 m of the Study Area. A summary of the sites is provided below.

Table 2: List of previously registered sites within one kilometre of the Study Area

Borden #	Site Name	Cultural Affiliation	Site Type	Researcher
AeHa-172	PDN 4	Precontact Indigenous	Scatter	ARA 1986
AeHa-173	PDN 5	Precontact Indigenous	Scatter	ARA 1986
AeHa-192	PDN 81	Precontact Indigenous	Scatter	ARA 1986
AeHb-115	Taylor Davy	Precontact Indigenous	Scatter	MHCI 2011
AeHb-32	Vallee 1	Precontact Indigenous	Unknown	ARA 2004
AeHb-34	Southside 1	Precontact Indigenous	Scatter	MHCI 2006
AeHb-35	Southside 3	Precontact Indigenous	Scatter	MHCI 2006
AeHb-36	Southside 2	Precontact Indigenous	Findspot	MHCI 2006
AeHb-37	Southside 4	Precontact Indigenous	Scatter	MHCI 2006
AeHb-38	Southside 5	Precontact Indigenous	Scatter	MHCI 2006
AeHb-39	**Southside 6**	**Precontact Indigenous**	**Scatter**	**MHCI 2006**
AeHb-40	Spencer	Precontact Indigenous	Scatter	MHCI 2006
AeHb-41	Rachel	Precontact Indigenous	Scatter	MHCI 2006
AeHb-42	**Devin**	**Precontact Indigenous**	**Scatter**	**MHCI 2006**
AeHb-43	Jason	Precontact Indigenous	Scatter	MHCI 2006
AeHb-44	John	Precontact Indigenous	Scatter	MHCI 2006
AeHb-45	Stephie	Precontact Indigenous	Scatter	MHCI 2006
AeHb-47	Dale	Precontact Indigenous	Findspot	MHCI 2006
AeHb-48	Judy	Precontact Indigenous	Findspot	MHCI 2006
AeHb-49	Kenneth	Precontact Indigenous	Scatter	MHCI 2006
AeHb-50	Gordon	Precontact Indigenous	Findspot	MHCI 2006

Bolded sites are within 50m of the Study Area
ARA - Archaeological Research Associated Ltd.
MHCI – Mayer Heritage Consultants Inc.

According to the background research, three previous reports detail fieldwork within 50 m of the Study Area.

In 2006 Mayer Heritage Consultants Inc. conducted a Stage 1-2 assessment of the Southside Developments project in Port Dover (CIF:P040-133; Mayer Heritage Consultants Inc. 2006). This Study Area covers the current Study Area. Pedestrian survey at five metre intervals was conducted across the 170 hectare (ha) study area with the exception of three areas that were noted as low and wet or sloped and did not exhibit potential. In total, 54 sites were encountered and 12 sites were recommended for Stage 3 investigation. The closest sites to the current Study Area recommended for further work, AeHb-39 and AeHb-42 which are approximately 50 m away on the other side of Highway 6 (note: the scale bar on Mayer 2006 Figure 5 is incorrect). During the Stage 2 assessment site AeHb-39 consisted of four chert flakes and AeHb-42 consisted of 10 chert flakes all of the artifacts were found during pedestrian survey. Both sites were subsequently subjected to a Stage 3 site investigation. Eight test units were excavated and

20 artifacts were found for AeHb-39 and five units and 12 artifacts were recovered for AeHb-42; both sites were considered fully documented and no further work was recommended (P040, licensee's identification numbers are noted as 05-072:23 and 05-072:26 in the OASD). This report was not attached to the current Study Area EA documentation and the proponent was unaware that the previous assessment had been completed. ASI was advised to complete the fieldwork before winter weather set in and the existence of the 2006 MHCI report was only discovered after ASI's Stage 2 property survey was in progress.

In 2012 Archaeological Research Associates Ltd. conducted a Stage 1-2 of the Highway 6 Rehabilitation (PIFs: P007-377-2011 and P077-380-2011; ARA 2012), including parts of the current Study Area. The relevant portion of the project area noted that the Highway 6 ROW was extensively disturbed and did not have archaeological potential. A small strip of agricultural field adjacent to the ROW was subject to pedestrian survey at 5 m intervals (Maps 28 and 29). The entire project area was noted as not requiring any further work and should be considered free of archaeological concern.

1.3.3 Stage 1 Analysis of Archaeological Potential

The S & G, Section 1.3.1, lists criteria that are indicative of archaeological potential. The Study Area meets the following criteria indicative of archaeological potential:

- Previously identified archaeological sites (See Table 2)
- Early historic transportation routes (Plank Road/Highway 6); and
- Proximity to early settlements (Port Dover)

According to the S & G, Section 1.4 Standard 1e, no areas within a property containing locations listed or designated by a municipality can be recommended for exemption from further assessment unless the area can be documented as disturbed. The Municipal Heritage Register was consulted and no properties within the Study Area are Listed or Designated under the *Ontario Heritage Act*.

These criteria are indicative of potential for the identification of Indigenous and Euro-Canadian archaeological resources, depending on soil conditions and the degree to which soils have been subject to deep disturbance.

2.0 FIELD METHODS: PROPERTY INSPECTION

The Stage 2 property assessment was conducted under the field direction of Sean Heafner (R1253) on December 15, 2020 in accordance with the *Ontario Heritage Act* and the S & G, Section 2. During all periods of field assessment, weather and lighting conditions permitted good visibility and were in accordance with the S & G, Section 2.1, Standard 3. Photographs of all field conditions were taken (Plates 1-3), and the location and direction of each photograph is mapped in Figure 7.

The Stage 2 Study Area comprises approximately 1.72 ha of an active agricultural field and a portion of the Highway 6 ROW. The Highway 6 ROW (36.4 %, 0.62 ha) was previously assessed and noted as having no archaeological potential by ARA in 2012. The remainder of the Study Area was assessed as having archaeological potential and was subject to Stage 2 pedestrian survey at five m intervals (53.6 %, 0.92 ha). Prior to the initiation of the Stage 2 survey, the agricultural lands within the Study Area were prepared by the farmer in early December 2020 at the request of the Hatch Limited. A tractor and mould-

board plough were used to turn the soils over, and a disc attachment was used on the fields twice in alternating directions. The field preparation methods used meet the requirements of S & G Section 2.1.1, Standards 1-5 for pedestrian survey. All standards were met; ploughing was deep enough to provide total topsoil exposure, but not deeper than previous ploughing and weathering was excellent resulting in surface visibility greater than 80 % (Plates 1-3).

One poorly drained area was noted in the field with an area of standing water that made pedestrian survey impossible. However, it was subsequently determined that this area was previously assessed by Mayer Heritage Consultants in 2006. The 2006 assessment was completed before the current 2011 S & Gs were in place, however the assessment methodology used complies with the current S & G Section 2.1.1 and therefore does not require resurvey. As noted earlier, the 2006 report was not attached to the EA documentation and the proponent was unaware that any archaeological surveys had been conducted previously. ASI was advised to complete the fieldwork before the winter weather set in and the existence of the Mayer 2006 report was only noted after the Stage 2 fieldwork was in progress.

3.0 RECORD OF FINDS

No archaeological resources were recovered during the Stage 2 survey.

3.1 Documentary and Material Record

The documentation related to this archaeological assessment will be curated by ASI until such a time that arrangements for their ultimate transfer to Her Majesty the Queen in right of Ontario, or other public institution, can be made to the satisfaction of the project owner(s), the MHSTCI, and any other legitimate interest groups.

Table 3 provides an inventory and location of the documentary and material record for the project in accordance with the S & G, Sections 6.7 and 7.8.2.3.

Table 3: Inventory of Documentary and Material Record

Document/Material	Location	Comments
Written Field Notes, Annotated Field Maps, GPS Logs, etc.	Archaeological Services Inc., 528 Bathurst Street, Toronto, ON M5S 2P9	Field notes hard copy, GPS data (digital) [2 files]
Field Photography (Digital)	Archaeological Services Inc., 528 Bathurst Street, Toronto, ON M5S 2P9	Stored on ASI network servers [12 files]
Research/Analysis/Reporting Materials (Various Formats)	Archaeological Services Inc., 528 Bathurst Street, Toronto, ON M5S 2P9	Hard copy and/or digital files stored on ASI network servers [3 files]

4.0 ANALYSIS AND CONCLUSIONS

ASI was contracted by Hatch to conduct a combined Stage 1-2 Archaeological Assessment as part of the Highway 6 Roundabout project located in the Town of Port Dover, County of Norfolk. This project involves the design and construction of a traffic roundabout on Highway 6 that will service planned

residential subdivisions. The lands in question comprise 1.71 ha of active agricultural field and the ROW of Highway 6. The preliminary Stage 1 background research determined that the Study Area retained archaeological potential. Additional background research conducted after the Stage 2 fieldwork was in progress, uncovered a 2006 Mayer Heritage Stage 2 report documenting that the area has been previously assessed.

The Stage 2 property assessment was conducted between December 15, 2020 under the field direction of Sean Heafner (R1253) on December 15, 2020. Initial survey determined that a portion of the Study Area (36.4 %, 0.62 ha) was previously assessed by ARA in 2012 and it was noted as not having archaeological potential due to previous deep and extensive ground disturbance. The remainder of the Study Area was assessed as having archaeological potential (63 %, 1.09 ha) and was subject to Stage 2 pedestrian survey at 5 m intervals. One area (10 %, 0.17 ha) was not assessed due to standing water, but was however previously assessed by Mayer Heritage Consultants (2006) by pedestrian survey at 5 m intervals and no archaeological resources were identified. No archaeological resources were encountered during the course of ASI's Stage 2 assessment for the Highway 6 Roundabout and the Study Area can be considered free of archaeological concern.

5.0 RECOMMENDATIONS

In light of these results, the following recommendations are made:

1. The Highway 6 Roundabout Study Area does not require further archaeological assessment; and

2. Should changes to the project design or temporary workspace requirements result in the inclusion of previously un-surveyed lands, these lands should be subject to a Stage 2 archaeological assessment.

NOTWITHSTANDING the results and recommendations presented in this study, ASI notes that no archaeological assessment, no matter how thorough or carefully completed, can necessarily predict, account for, or identify every form of isolated or deeply buried archaeological deposit. In the event that archaeological remains are found during subsequent construction activities, the consultant archaeologist, approval authority, and the Archaeology Programs Unit of the MHSTCI should be immediately notified.

6.0 ADVICE ON COMPLIANCE WITH LEGISLATION

ASI also advises compliance with the following legislation:

- This report is submitted to the Ministry of Heritage, Sport, Tourism and Culture Industries as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, RSO 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological field work and report recommendations ensure the conservation, preservation and protection 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 Heritage, Sport, Tourism and Culture Industries, 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.

- 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 time as a licensed archaeologist has completed archaeological field work 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 Archaeology Reports referred to in Section 65.1 of the *Ontario Heritage Act.*

- 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 sec. 48 (1) of the *Ontario Heritage Act*.

- The *Cemeteries Act*, R.S.O. 1990 c. C.4 and the *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Government and Consumer Services.

- 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, nor may artifacts be removed from them, except by a person holding an archaeological license.

7.0 REFERENCES CITED

Aboriginal Affairs and Northern Development Canada
2016 Between the Lakes Purchase and Collins Purchase, No. 3. *Treaty Texts – Upper Canada Land Surrenders*. https://www.aadnc-aandc.gc.ca/eng/1370372152585/1370372222012#ucls5.

ARA, (Archaeological Research Associated Ltd.)
2012 *Stage 1 and 2 Archaeological Assessments Highway 6 Rehabilitation from Port Dover Northerly to the Jarvis South Limits GWP 3048-03-00 Geographic Townships of Woodhouse and Walpole Norfolk and Haldimand Counties, Ontario*. January 20.

ASI, (Archaeological Services Inc.)
2006 *Historical Overview and Assessment of Archaeological Potential Don River Watershed, City of Toronto*. Report on file with the Ontario Ministry of Heritage, Sport, Tourism and Culture Industries, Toronto.

Birch, J., and R. F. Williamson
2013 *The Mantle Site: An Archaeological History of an Ancestral Wendat Community*. Rowman & Littlefield Publishers, Inc., Latham.

Brown, J.
1995 On Mortuary Analysis – with Special Reference to the Saxe-Binford Research Program. In *Regional Approaches to Mortuary Analysis*, L. A. Beck, editor, pp. 3–23. Plenum Press, New York.

Chapman, L.J., and F. Putnam
1984 *The Physiography of Southern Ontario*. Vol. 2. Ontario Geologic Survey, Special Volume. Ontario Ministry of Natural Resources, Toronto.

Department of National Defence
1939 Simcoe Sheet.

Dodd, C. F., D. R. Poulton, P. A. Lennox, D. G. Smith, and G. A. Warrick
1990 The Middle Ontario Iroquoian Stage. In *The Archaeology of Southern Ontario to A.D. 1650*, C. J. Ellis and N. Ferris, editors, pp. 321–360. Occasional Publication of the London Chapter OAS Number 5. Ontario Archaeological Society Inc., London, ON.

Edwards, T.W.D., and P. Fritz
1988 Stable-Isotope Palaeoclimate Records from Southern Ontario, Canada: Comparison of Results from Marl and Wood. *Canadian Journal of Earth Sciences* 25:1397–1406.

Ellis, C. J., and D. B. Deller
1990 Paleo-Indians. In *The Archaeology of Southern Ontario to A.D. 1650*, C. J. Ellis and N. Ferris, editors, pp. 37–64. Occasional Publication of the London Chapter OAS Number 5. Ontario Archaeological Society Inc., London, ON.

Ellis, C. J., I. T. Kenyon, and M. W. Spence
1990 The Archaic. In *The Archaeology of Southern Ontario to A.D. 1650*, C. J. Ellis and N. Ferris, editors, pp. 65–124. Occasional Publication of the London Chapter OAS Number 5.

Ontario Archaeological Society Inc., London, ON.

Ellis, C. J., P. A. Timmins, and H. Martelle
2009 At the Crossroads and Periphery: The Archaic Archaeological Record of Southern Ontario. In *Archaic Societies: Diversity and Complexity across the Midcontinent.*, T. D. Emerson, D. L. McElrath, and A. C. Fortier, editors, pp. 787–837. State University of New York Press, Albany, New York.

Ferris, N.
2013 Place, Space, and Dwelling in the Late Woodland. In *Before Ontario: The Archaeology of a Province*, pp. 99–111. McGill-Queen's University Press. http://www.jstor.org/stable/j.ctt32b7n5.15.

Johnston, C. E.
1964 *The Valley of the Six Nations: A Collection of Documents on the Indian Lands of the Grand River*. The Champlain Society, Toronto, Ontario.

Karrow, P.F., and B.G. Warner
1990 The Geological and Biological Environment for Human Occupation in Southern Ontario. In *The Archaeology of Ontario to A.D. 1650*, pp. 5–36. Occasional Publications 5. London Chapter, Ontario Archaeological Society, London.

Lytwyn, V. P.
2005 *Historical Research Report: Aboriginal Settlement and Use of the North Pickering Development Planning Area and Adjacent Lands, 1690-1923.*

MacDonald, I.D.
1980 *Life Science Features of the Haldimand Clay Plain Physiographic Region*. Ontario Ministry of Natural Resources, Parks and Recreation Section, Central Region, Richmond Hill.

Mayer Heritage Consultants Inc.
2006 *Archaeological Assessment (Stages 1 and 2) Southside Developments, Town of Port Dover, R. M. of Haldimand-Norfolk, Ontario*. P040-133. May.

MHSTCI, (Ministry of Heritage, Sport, Tourism and Culture Industries)
1990 *Ontario Heritage Act, R.S.O. 1990, c. O.18 [as Amended in 2019].*

2020 Ontario's Past Portal. *PastPortal*. https://www.pastport.mtc.gov.on.ca.

Mika, N., and H. Mika
1983 *Places In Ontario: Their Name Origins and History, Part III, N-Z*. Mika Publishing Company, Belleville.

Ministry of the Environment
1990 Environmental Assessment Act, R.S.O. Province of Ontario.

Ministry of Tourism and Culture
2011 *Standards and Guidelines for Consultant Archaeologists*. Cultural Programs Branch,

Ontario Ministry of Tourism and Culture, Toronto.

Municipal Engineers Association
2000 *Municipal Class Environmental Assessment, Last Amended 2015*.

Ontario Geological Survey
2010 Surficial Geology of Southern Ontario. Miscellaneous Release — Data 128 – Revised. http://www.geologyontario.mndm.gov.on.ca/mndmaccess/mndm_dir.asp?type=pub&id=MRD128-REV.

Page & Co.
1877 Illustrated Historical Atlas of the Counties of Haldimand and Norfolk. Toronto.

Rogers, Edward S.
1962 *The Round Lake Ojibwa*. Royal Ontario Museum.

Smith, W.H.
1846 *Smith's Canadian Gazetteer, Comprising Statistical and General Information Respecting All Parts of the Upper Province, or Canada West*. H. & W. Rowsell, Toronto.

Spence, M. W., R. H. Pihl, and C. Murphy
1990 Cultural Complexes of the Early and Middle Woodland Periods. In *The Archaeology of Southern Ontario to A.D. 1650*, C. J. Ellis and N. Ferris, editors, Occasional Publication of the London Chapter OAS Number 5. Ontario Archaeological Society Inc., London.

Tremaine, G.C
1856 Map of the County of Norfolk. Kingston, Ontario.

Williamson, R. F.
1990 The Early Iroquoian Period of Southern Ontario. In *The Archaeology of Southern Ontario to A.D. 1650*, C. J. Ellis and N. Ferris, editors, pp. 291–320. Occasional Publication of the London Chapter OAS Number 5. Ontario Archaeological Society Inc., London.

8.0 MAPS

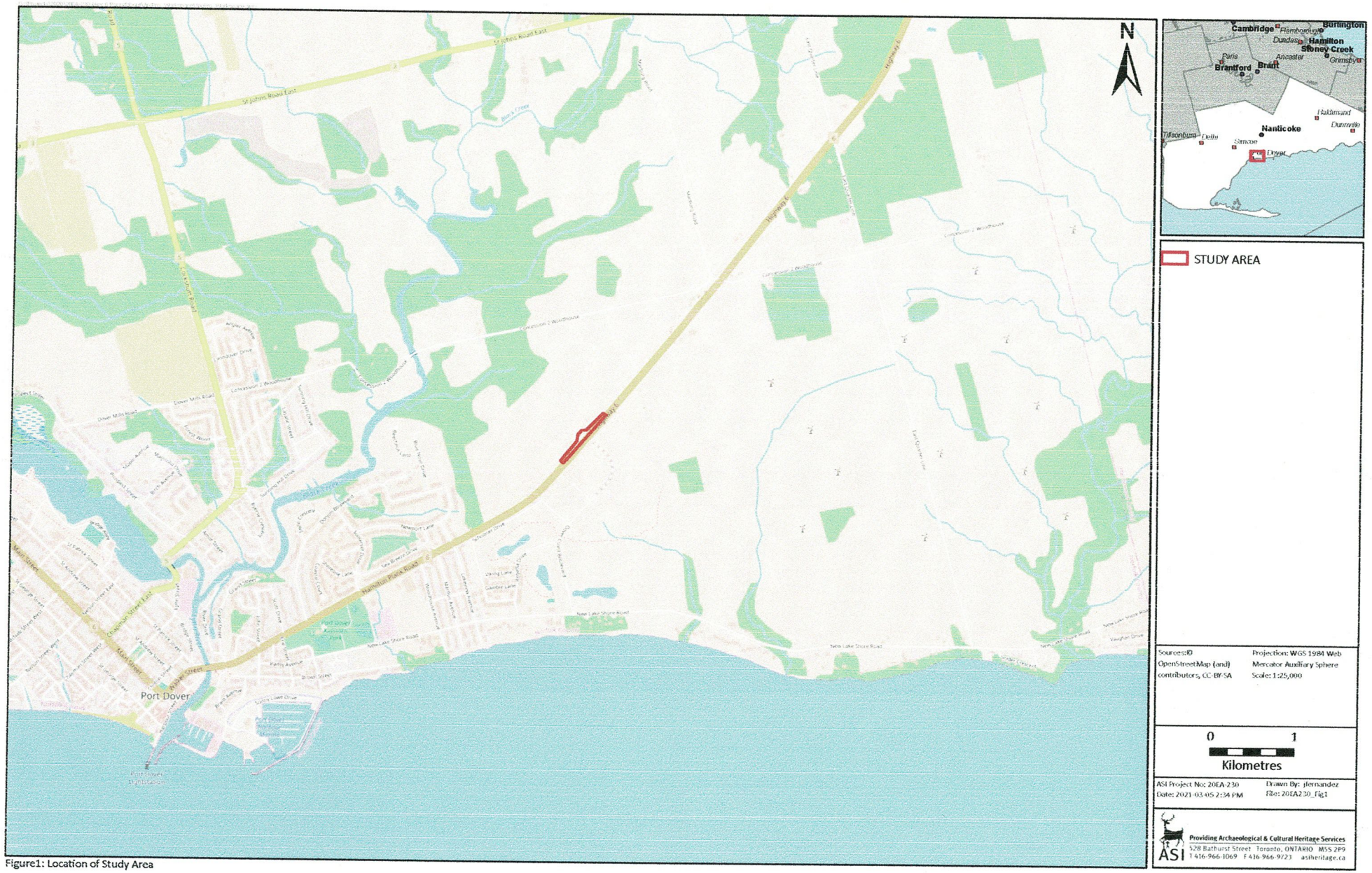

Figure1: Location of Study Area

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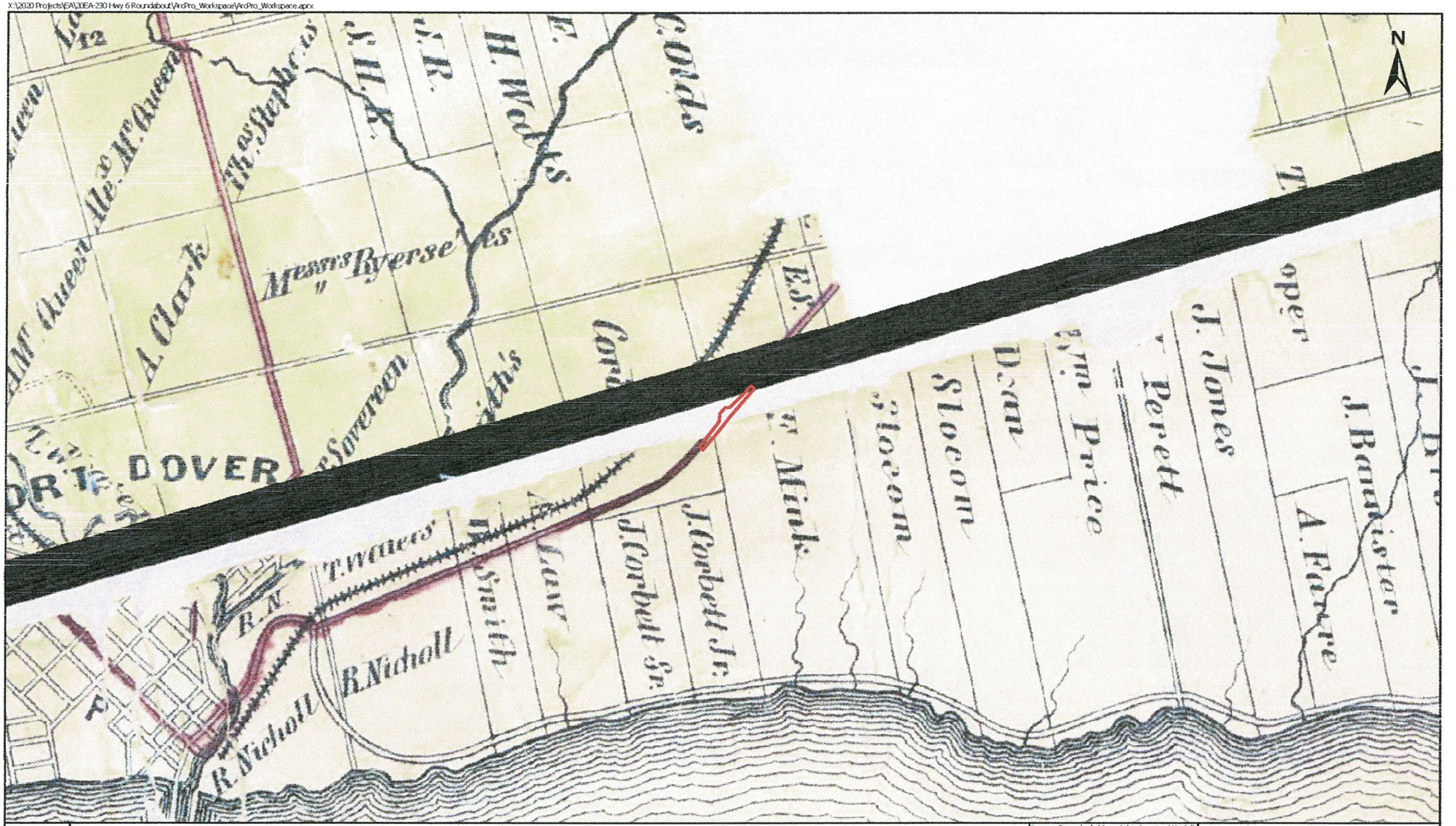

Figure 2: Study Area Located on the 1856 Tremaine Map of Norfolk

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STUDY AREA

Source: Illustrated Historic Atlas for the County of Norfolk, Woodhouse Sheet (1878)

Projection: NAD 1983 UTM Zone 17N
Scale: 1:15,000
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Figure 3: Study Area Located on the 1878 Illustrated Atlas of the County of Norfolk

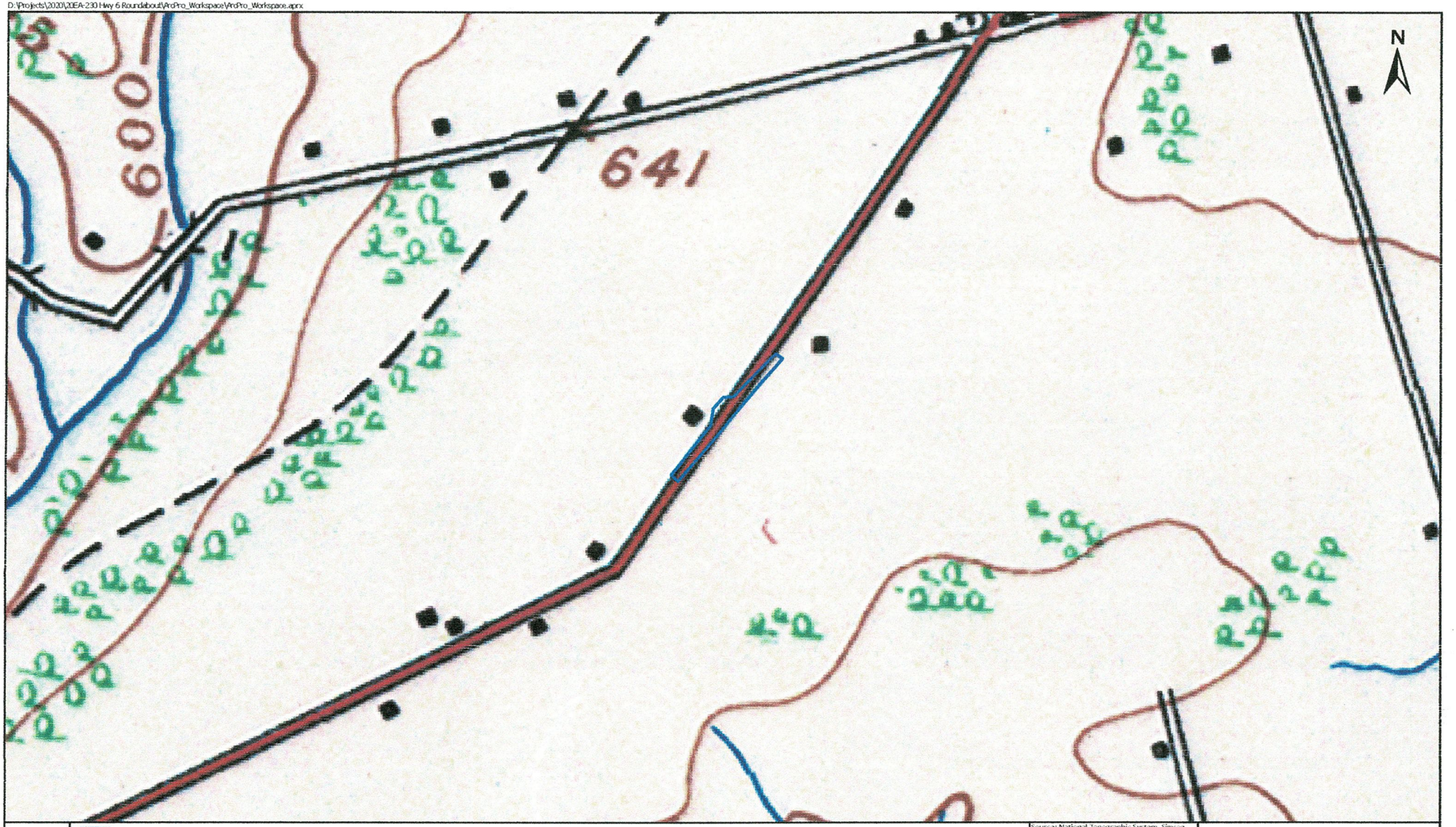

Figure 4: Study Area Located on the 1939 NTS, Simcoe Sheet

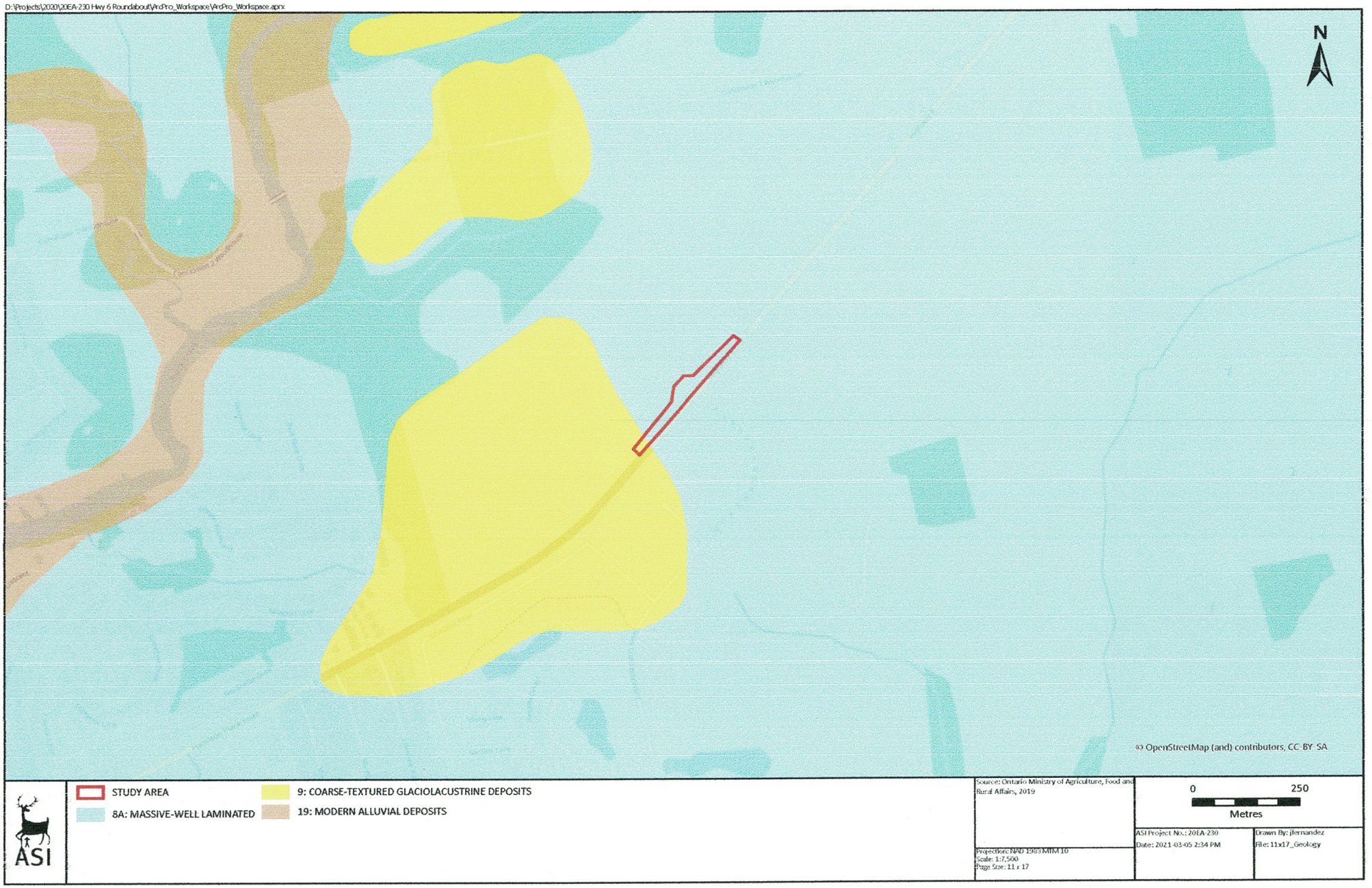

Figure 5: Study Area - Surficial Geology

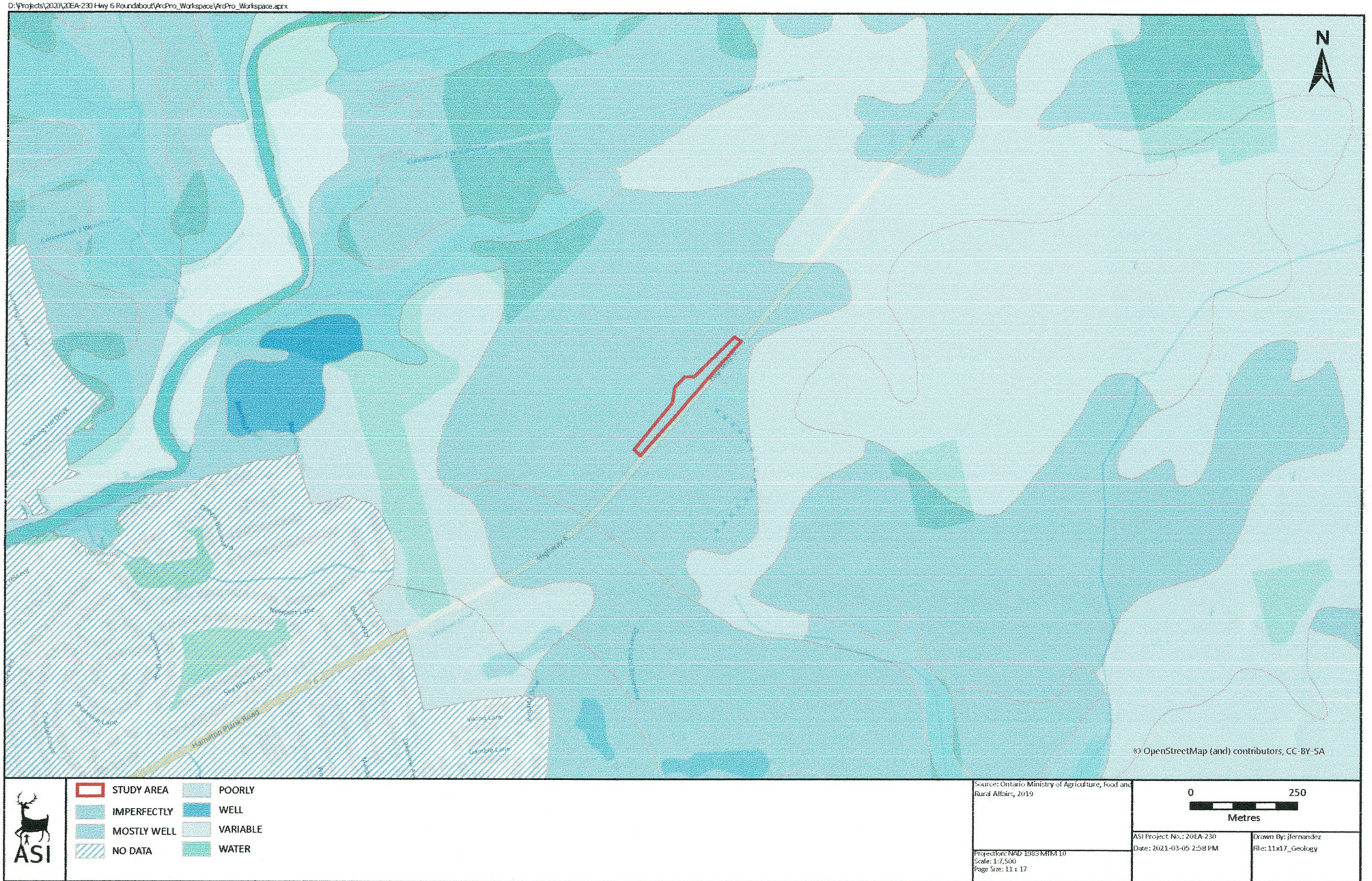

Figure 6: Study Area - Soil Drainage

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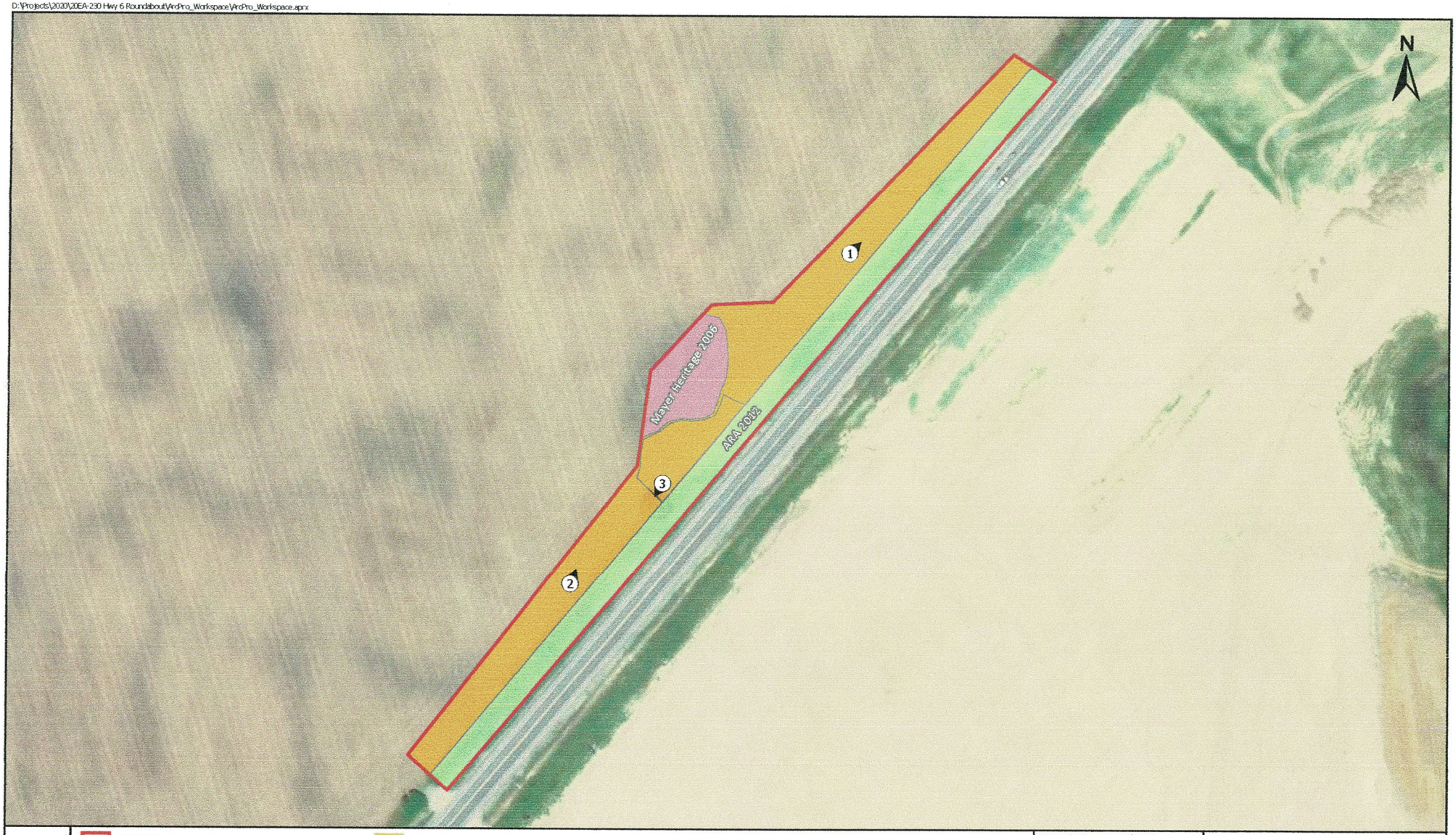

ASI

STUDY AREA

PHOTO LOCATION AND DIRECTION

PEDESTRIAN SURVEY AT 5 M INTERVALS

PREVIOUSLY ASSESSED: NO ARCHAEOLOGICAL POTENTIAL

PREVIOUSLY ASSESSED: NO FURTHER WORK REQUIRED

Sources: GeoEye, Maxar, Microsoft

Projection: NAD 1983 UTM Zone 17N
Scale: 1:1,300
Page Size: 11 x 17

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Figure 7: Stage 2 Results

9.0 IMAGES

Plate 1: Field conditions at the time of pedestrian survey

Plate 2: Pedestrian survey at 5 m intervals in progress

Plate 3: Pedestrian survey at 5 m intervals in progress

Archaeological Assessment (Stages 1 and 2)
Stadler Farms Subdivision, Town of Port Dover,
R.M. of Haldimand-Norfolk, Ontario

Mayer
Heritage
Consultants Inc.

Cultural Heritage Assessments and Archaeological Mitigative Excavations

Archaeological Assessment (Stages 1 and 2) Stadler Farms Subdivision, Town of Port Dover, R. M. of Haldimand-Norfolk, Ontario

Submitted to
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50 Dalhousie St., Suite 205
Brantford, Ontario
N3T 2H8

and

Ontario Ministry of Culture

Prepared by

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Archaeological Consulting Licence Number P040
Contract Information Form Number P040-031
Corporate Project Number 03-107

Table of Contents

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Project Manager	Paul J. C. O'Neal
Report Preparation	Paul J. C. O'Neal
Field Director	Paul J. C. O'Neal
Field/Office Assistants	Jonathan Freeman Linda Gudgeon
Graphics	Chantal O'Neal

Acknowledgments

Preparation of this report was facilitated by the assistance of the following individuals and their agencies:

- ***J. Byron Wiebe, P.Eng.,*** Wiebe Engineering Group Inc.
- ***Ignaz Stadler,*** Stadler Farms, and
- ***Robert von Bitter***, Archaeological Data Co-ordinator, Ontario Ministry of Culture.

Archaeological Assessment (Stages 1 and 2) Stadler Farms Subdivision, Town of Port Dover, R. M. of Haldimand-Norfolk, Ontario

Introduction

Among other matters, the *Planning Act R.S.O. 1990*, establishes that the protection of features of archaeological interest is a matter of provincial concern. As such, an archaeological resource assessment (Stage 1 background research and Stage 2 general survey) was conducted as a standard condition of approval for the proposed Stadler Farms Subdivision, located at 169 New Lakeshore Road, in the town of Port Dover, Regional Municipality of Haldimand-Norfolk, Ontario (Figure 1).

This assessment was conducted in order to determine if any direct and/or indirect impacts would occur by proposed construction activities on archaeological resources that might be present. Archaeological resources consist of artifacts (Aboriginal stone tools, pottery and subsistence remains as well as Euro-Canadian objects), subsurface settlement patterns and cultural features (post moulds, trash pits, privies, and wells), and sites (temporary camps and special purpose activity areas, plus more permanent settlements such as villages, homesteads, grist mills and industrial structures).

Stage 1 Background Research

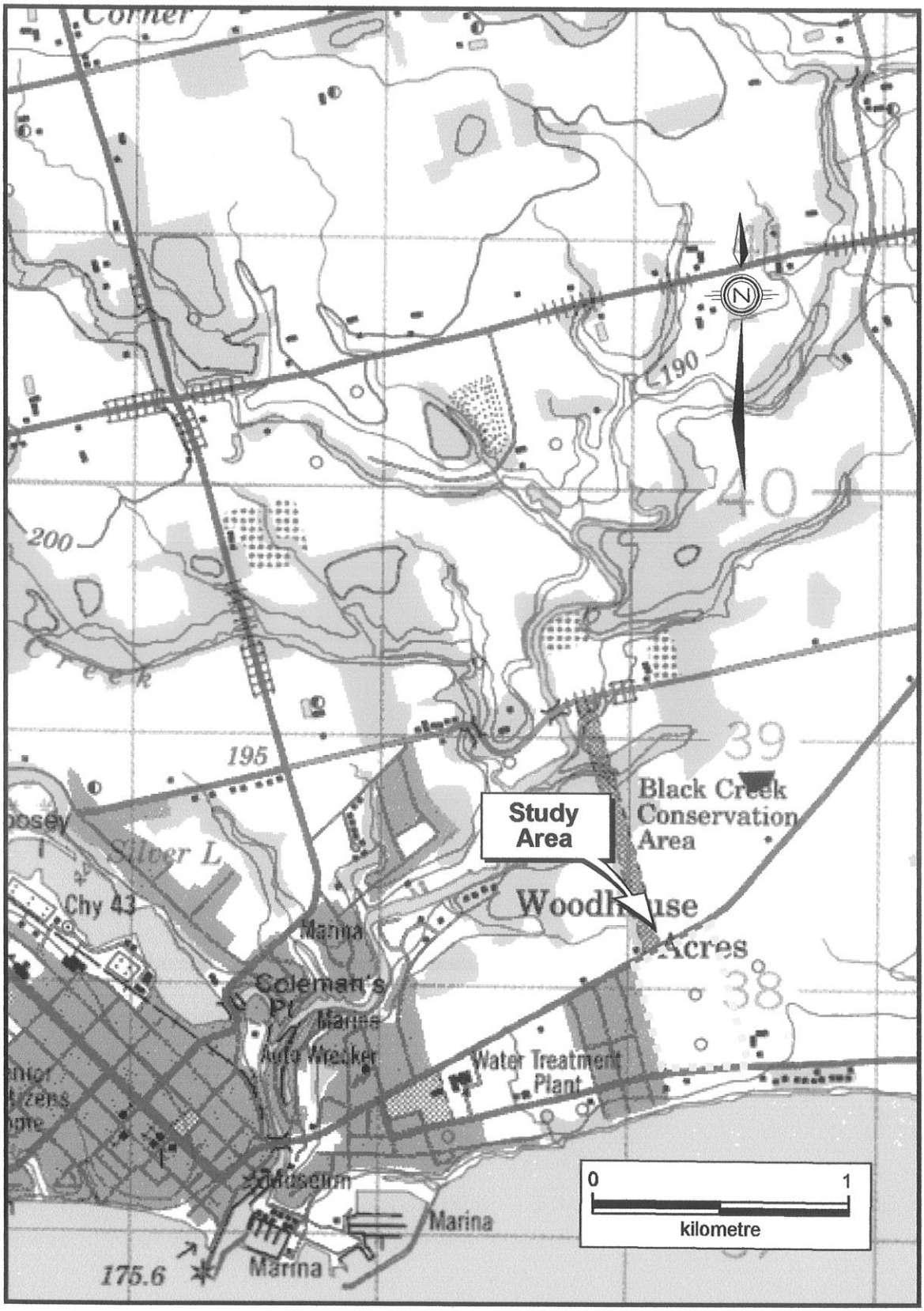
Stage 1 background research was conducted in order to complete the following tasks:

- amass all of the readily available information on any previous archaeological surveys in the area;
- determine the locations of any registered and unregistered sites; and
- develop an historical framework for assigning levels of potential significance to any new sites discovered during fieldwork.

The framework for assigning levels of potential archaeological significance is drawn from provincial guidelines (Weiler 1980). The necessary information includes the identification and evaluation of any feature that has one or more of the following attributes:

- *it has the potential through archaeological exploration, survey or fieldwork to provide answers to substantive questions (i.e. relate to particular times and places) about events and processes that occurred in the past and therefore add to our knowledge and appreciation of history;*
- *it has the potential through archaeological exploration, survey and fieldwork to contribute to testing the validity of general anthropological principles, cultural change and ecological adaptation, and therefore to the understanding and appreciation of our man-made heritage; or*
- *it is probable that various technical, methodological, and theoretical advances are likely to occur during archaeological investigation of a feature, alone or in association with other features, and therefore contribute to the development of better scientific means of understanding and appreciating our man-made heritage (Weiler 1980:8);*

Figure 1: Location of the Study Area.



Natural Environment

The study area is within the Norfolk Sand Plain (Chapman and Putnam 1984). The *Soils of the Regional Municipality of Haldimand-Norfolk* (Acton and Presant, 1984) indicate the dominant surface soil type of the subject area as mainly lacustrine silty clay with moderately well drainage. The topography is smooth very steeply sloping. The study area is located on the shore of Lake Erie.

Potential for Archaeological Resources

Archaeological potential is defined as the likelihood of finding archaeological sites within a study area. For planning purposes, determining archaeological potential provides a preliminary indication that significant sites might be found within the study area, and consequently, that it may be necessary to allocate time and resources for archaeological survey and mitigation. In predicting the locations of archaeological sites, the *Primer on Archaeology, Land Use Planning and Development in Ontario* (Ministry of Culture 1997:12-13) states that undisturbed lands, or those with minimal disturbance, such as cultivated fields, within 300 metres of a primary water source or 200 metres of a secondary or tertiary water source are considered to have archaeological potential. Other criteria can include location on elevated ground or near distinctive or unusual landforms, and the presence of well-drained sandy soils.

Based upon a published synthesis of Aboriginal cultural occupations (Wright 1968), Table 1 is a general outline of the cultural history of southwestern Ontario that is applicable to the study area. Ellis and Ferris (1990) provide greater detail of the distinctive characteristics of each time period and cultural group. The Ministry of Culture archaeological database coordinator (von Bitter 2003) indicated that there are three previously registered archaeological sites within 2,000 metres of the study area (Table 2).

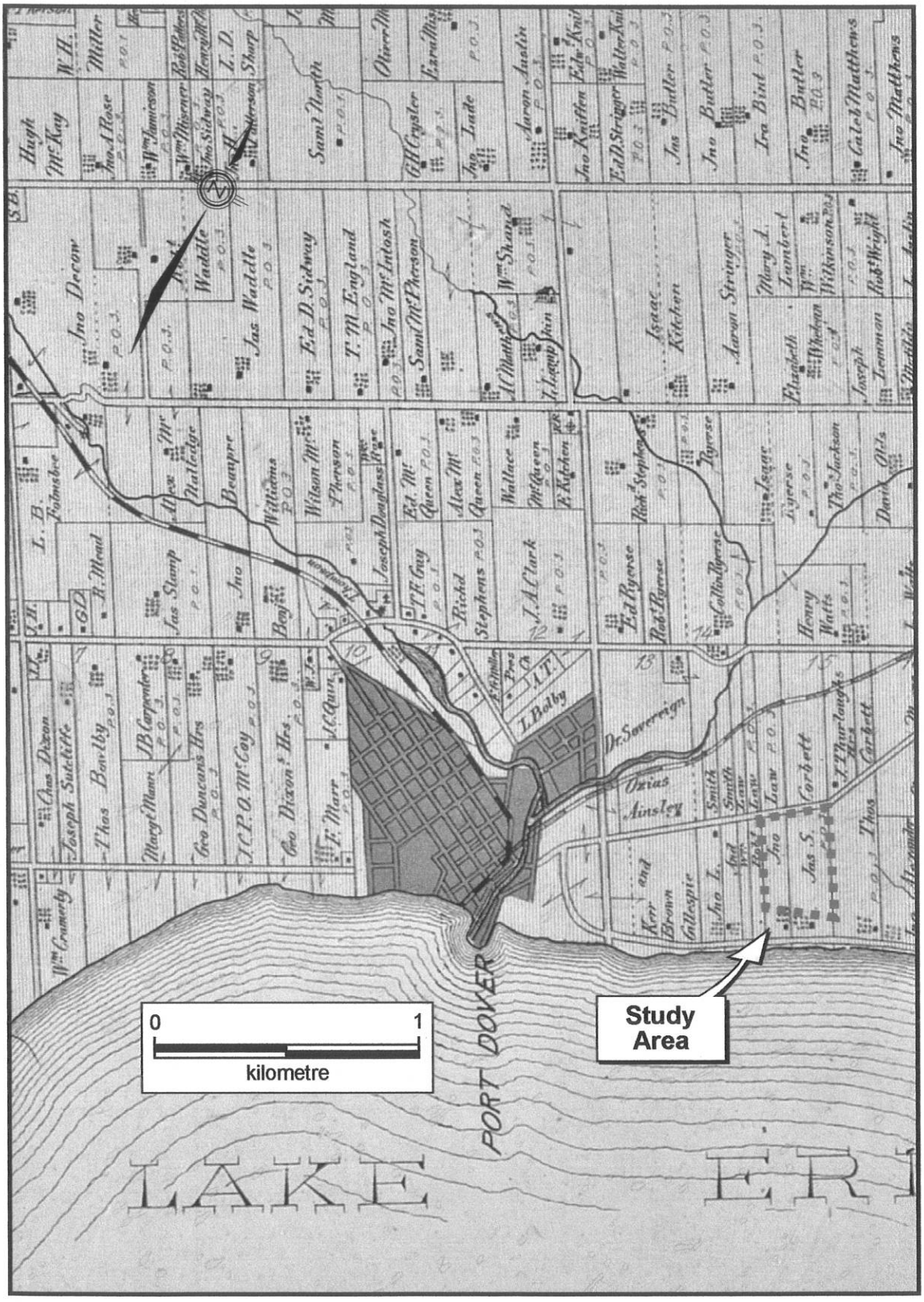
Table 1: General Cultural Chronology for Southwestern Ontario.

PERIOD	*GROUP*	*TIME RANGE*	*COMMENTS*
Early Paleo-Indian	Fluted Projectiles	9500 - 8500 B.C.	big game hunters
Late Paleo-Indian	Hi-Lo Projectiles	8500 - 7500 B.C.	small nomadic groups
Early Archaic	---	7800 - 6000 B.C.	nomadic hunters and gatherers
Middle Archaic	Laurentian	6000 - 2000 B.C.	territorial settlements
Late Archaic	Lamoka	2500 - 1700 B.C.	polished ground stone tools
"	Broadpoint	1800 - 1400 B.C.	---
"	Crawford Knoll	1500 - 500 B.C.	---
"	Glacial Kame	*circa* 1000 B.C.	burial ceremonialism
Early Woodland	Meadowood	1000 - 400 B.C.	introduction of pottery
"	Red Ochre	1000 - 500 B.C.	---
Middle Woodland	Western Basin/Saugeen	400 B.C. - A.D. 500	long distance trade networks
"	Princess Point	A.D. 500 - 800	incipient agriculture
Late Woodland	Glen Meyer	A.D. 800 - 1300	transition to village life
"	Uren	A.D. 1300 - 1350	large villages with palisades
"	Middleport	A.D. 1300 - 1400	wide distribution of ceramic styles
"	Neutral/Huron	A.D. 1400 - 1650	tribal warfare
Early Contact	Mississauga plus others	A.D. 1700 - 1875	tribal displacement
Late Contact	Euro-Canadian	A.D. 1800 - present	European settlement

Figure 2: Study Area Facing South.

Figure 3: Soil Conditions.

Figure 4: Site Location on Historic Atlas.



Over their thousands of years of occupation in the general region, Aboriginal people, have left behind, to a greater or lesser degree, physical evidence of their lifeway activities and settlements at many locations. The earliest possible human occupation was during the Paleo-Indian period (*circa* 9000 to 7000 B.C.) wherein small groups of nomadic peoples hunted big game along the shorelines of glacial lakes. These people were few in number and their small, temporary campsites are relatively rare.

People during the Archaic period (*circa* 7000 to 1000 B.C.) were still primarily nomadic hunters but also established territorial settlements, gathered seasonally available resources, and introduced burial ceremonialism. Late Archaic period sites are more numerous and can be quite large due to repeated annual visits.

Sites of the Woodland period (*circa* 1000 B.C. to A.D. 1650) are usually the most numerous because the population levels in southwestern Ontario had significantly increased. The manufacture of ceramic pottery vessels for storage and cooking was introduced along with the establishment of long distance trading networks, horticulture, warfare and large palisaded villages.

Table 2: Registered Archaeological Sites within 2,000 metres of the Study Area.

REGISTRATION #	*NAME*	*TYPE*	*CULTURAL AFFILIATION*
AeHb-20	Nordix 1	Campsite	Late Archaic
AeHb-21	Nordix 2	Homestead	Euro-Canadian
AeHb-22	Nordix 3	Campsite	Prehistoric

Sites of the Contact period (*circa* A.D. 1650 to 1900) include Aboriginal and Euro-Canadian residences and industries. *Tremaine's 1856 Map of the County of Norfolk* shows the study area owned by "J. Corbett Jr." and "J Corbett Sr.". H.R. Page & Co.'s 1877 map of Woodhouse Township in the *Illustrated Historical Atlas of Norfolk County* indicates that "James S. Corbett" and Jonathan Law owned that property. No structures are indicated on the lot within the current study area. The absence of other structures on this map, however, does not necessarily mean that one or more structures were not present at that time, earlier or later.

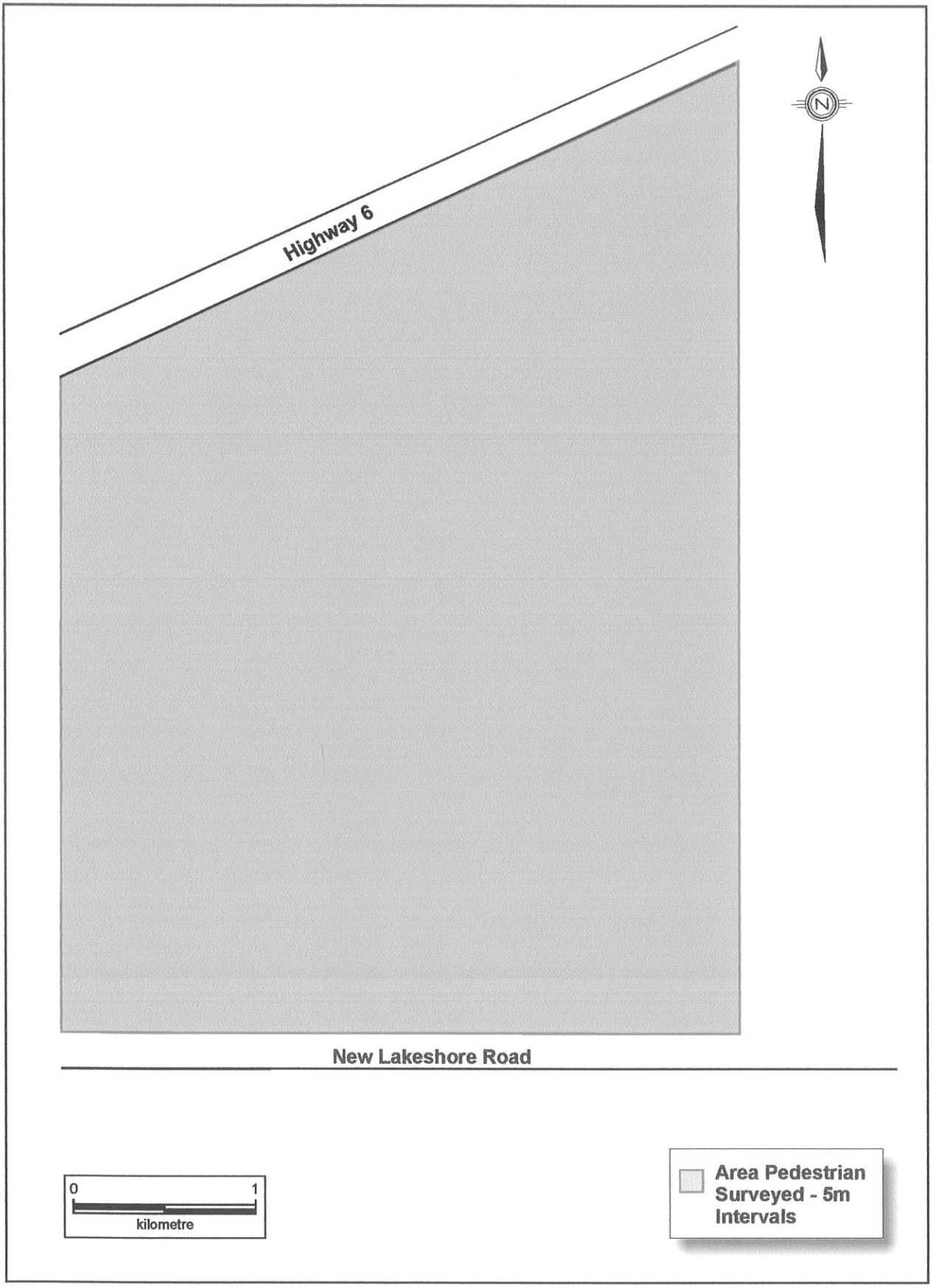
Based upon the soil and topography suitable for human habitation, the proximity to water and the historic significance of the geographic region, the study area exhibits high potential for the discovery of pre-contact Aboriginal and Euro-Canadian archaeological resources.

Stage 2 General Survey

The Stage 2 general survey employed the standard pedestrian transect method at a five-metre interval across the entire 37.85 acres of the study area, which was ploughed and well-weathered. Mayer Heritage received permission to enter the subject property and to remove artifacts as necessary during the survey conducted on December 23, 2004.

No artifacts were encountered during the Stage 2 general survey and no further archaeological assessment is recommended.

Figure 5: Site Map Showing Stage 2 Results



RECOMMENDATIONS

The following recommendations are provided for consideration by Wiebe Engineering Group Inc. and by the Ministry of Culture:

1. Additional assessment or mitigative measures are not warranted because no archaeological resources were found. The Ministry of Culture is requested to issue a letter recommending clearance of the archaeological condition attached to this development.
2. Although every reasonable effort was made to locate all archaeological resources, it is possible that some remain to be discovered within the study area. Should deeply buried archaeological material be found during construction, the Ministry of Culture in London (519-675-7742) and Mayer Heritage Consultants Inc. in London (519-472-8100 or 800-465-9990) should be immediately notified.
3. As on virtually any property in southern Ontario, it is possible that Aboriginal or Euro-Canadian burials could be present within the study area. In the event that human remains are encountered during construction, the proponent should immediately contact both the Ministry of Culture, and the Cemeteries Regulation Unit of the Ontario Ministry of Consumer and Commercial Relations in Toronto (416-326-8392), as well as the appropriate municipal police, the local coroner, and Mayer Heritage Consultants Inc.

References Cited and Consulted

Chapman, Lyman John and Donald F. Putnam
1984 The Physiography of Southern Ontario (Third Edition). ***Ontario Geological Survey Special Volume 2***. Ontario Ministry of Natural Resources, Toronto.

Ellis, Chris and Neal Ferris
1990 The Archaeology of Southern Ontario to A.D. 1650. ***Occasional Publication No. 5***. London Chapter, Ontario Archaeological Society Inc.

Government of Ontario
1990 ***The Heritage Act, R.S.O. 1990***. Queen's Printer, Toronto.

1990 ***The Planning Act, R.S.O. 1990***. Queen's Printer, Toronto.

1993 ***Archaeological Assessment Technical Guidelines***. Ministry of Tourism, Culture, and Recreation.

1997 ***Primer on Archaeology, Land Use Planning and Development in Ontario.*** Ontario Ministry of Tourism, Culture and Recreation.

Acton, C.J. and E.W. Presant

1984 ***The Soils of the Regional Municipality of Haldimand-Norfolk.*** Report No. 57 of the Ontario Institute of Pedology. Ontario Ministry of Agriculture and Food: Guelph, Ontario.

Page, H. R.
1877 ***Illustrated Historical Atlas of Norfolk County, Ontario***. Reprinted 1972, N.H. Mika, Belleville.

Tremaine, George R.
1856 ***Tremaine's Map of the County of Norfolk, Ontario.***

von Bitter, Robert
2003 E-mail transmission from the MoC Archaeological Data Co-ordinator regarding registered archaeological sites within 2,000 metres of the study area.

Weiler, John
1980 ***Guidelines on the Man-Made Heritage Component of Environmental Assessments.*** Ontario Ministry of Culture and Recreation, Toronto.

Wright James V.
1968 ***Ontario Prehistory: an eleven thousand-year archaeological outline***. Archaeological Survey of Canada, National Museums of Canada, Ottawa.

development engineering (London) Limited

CONSULTING CIVIL ENGINEERS

Technical Memorandum

Date: July 18, 2025

To: Stormwater Engineering Division, Norfolk County

Subject: **SWM Letter to Address Phase 4 of Dover Coast Subdivision**
DevEng Project Number: DEL13-124P4

Introduction

Development Engineering (London) Limited [DevEng] has been retained by Ballantry Homes to prepare detailed engineering design for Phase 4 of the Dover Coast Subdivision development in Port Dover, Ontario. Stormwater Management Facilities (SWMF) of the ultimate Dover Coast Subdivision were designed by G.D. Vallee Engineering Ltd. (Vallee) and constructed in 2011-2012. The Vallee Stormwater Management Report outlines an area of 14.20 ha tributary to SWMF 'E' (ref. drawing no. F2 in Appendix A), which the proposed 8.68 ha Phase 4 development is located within.

This Technical Memorandum is provided to supplement the above-noted report based on the detailed design of Phase 4, including stormwater conveyance and detention to accommodate both minor and major stormwater runoff from the subject site development area.

Storm Sewers and Stormwater Management

Allowable SWM Conditions

An Allowable Conditions model was created to determine the allowable outflow to the existing SWMF 'E' for design storm events ranging from the 2 to 100-year return period. Using an impervious percentage of 36%, which was derived from the allocated runoff coefficient of C=0.45 (ref. Master Storm Area Plan and Master Design Sheet by DevEng in Appendix A), based on the assumption that 0% and 100% imperviousness are equal to C=0.20 and C=0.90, respectively.

As identified on the Storm Area Plan and Design Sheet by DevEng, the design peak flows from A12 and A15 equate to a total of 698 L/s in the 5-year return period. The model was calibrated to the 5-year return period flows and generated the remaining storm event peak flows which are summarized in the Summary of Flows Table 2 in Appendix B. Refer to Appendix C for model schematic, inputs, and outputs.

Post-Development SWM Conditions

Post-Development conditions of the subject site propose a slight increase in runoff coefficient, from C=0.45 (allocated) to C=0.50; therefore, on-site permanent private system (PPS) controls are proposed.

A Post-Development model was prepared to estimate proposed hydrology and runoff, and to assess the hydraulic performance of the proposed SWM retention area storage, and multi-stage outlet system.

Subcatchments within the model were determined based on proposed grading and were assigned a runoff curve number of 82 (as per table 2.2a, USDA TR-55), along with an imperviousness percentages based on the proposed concept plan (by Blackthorn Development Corp., ref. to Appendix A). Refer to Appendix B for the site characteristics and calculation sheets, as well as Appendix D for the model schematic, inputs, and outputs.

Proposed Storm Sewer Network

Within the proposed development, a private storm sewer network consisting of sewers ranging in size from 300 to 600 mm along with roadside and rear-yard catchbasins will convey stormwater runoff. The storm network located within Streets A, B, C, and D conveys stormwater runoff to the existing Municipal sewer system on Dover Coast Boulevard. An internal network within the Park Block conveys stormwater runoff to the proposed SWM retention area for attenuation prior to discharging to the Street D network and ultimately to the existing Municipal sewer system on Dover Coast Boulevard. In accordance with Norfolk County Design Criteria, the storm sewer system has been designed to convey the 5-year storm event based on the Norfolk County IDF data (Refer to Engineering Drawings for Storm Sewer Calculations).

SWM Retention Area

A SWM retention area is located near the west limit of the park block and is proposed to attenuate a total area of 2.54 ha (catchment P3) consisting of rear-yards and the park block. The SWM retention area has been designed with a strategically sized multi-stage outlet system to control peak discharge rates, while allowing for excess stormwater to be temporarily stored on-site. This proposed outlet configuration includes a low-level outlet at the base which would restrict minor flows through a 200 mm orifice plate. A high-level outlet is also proposed for control of less frequent storm events (25-year return period and beyond) which would be routed into a ditch-inlet catchbasin at a sill elevation of 189.37 m through a 375 and 450 mm discharging to the Street D network.

Table A below summarises the modelled SWM retention area depths and storage volumes by design storm event. Each storm event elevation in the SWM retention area is also identified on Sheet 11 of the engineering drawings. The bottom of the basin ranges in elevation from 188.90 m to 188.77 m to provide positive drainage towards the outlet set at the lowest elevation. The top of basin is set at 190.59 m, which provides sufficient storage to control all storm events and to also provide more than the minimum requirement of 0.3 m freeboard above the 100-year stormwater level as noted in Section 7.4.01 in Norfolk County Design Guidelines.

Table A: Summary of SWM Retention Area Depth/Storage Volumes

Design Storm Event Return Period	Stormwater Depth / Elev. (m)	Storage Volume (m^3)
2-year	189.11 / 0.34	63
5-year	189.22 / 0.45	100
10-year	189.35 / 0.58	150
25-year	189.44 / 0.67	188
50-year	189.47 / 0.70	202
100-year	189.49 / 0.72	215
Hurricane Hazel	189.79 / 0.97	345

SWM Quantity Control

The SWM quantity control target is to restrict post-development peak flows from the development to less than or equal to those of the allowable conditions. Refer to the summary of Allowable and Post-Development Flows in Table 2 below. The modeling indicates that the proposed SWM retention area design can effectively restrict the post-development peak flow rates from the areas tributary to Dover Coast Boulevard to less than those established in the allowable condition. Refer to Appendices C and D for allowable and post-development model outputs, respectively.

Table B: Summary of Allowable and Post-Development Flows

Design Storm Event Return Period	Allowable Peak Runoff Rate to Dover Coast Boulevard (L/s)	Post Development Peak Outflow Dover Coast Boulevard (L/s)
2-year	467	461
5-year	698	680
10-year	855	828
25-year	1071	1032
50-year	1241	1191
100-year	1415	1354
Hurricane Hazel	N/A	985

Runoff Direct to Ex. SWMF 'E'

A portion (0.79 ha) of area along the south limit of the subject site is proposed to release runoff via sheet flow directly to the existing SWMF 'E'. Lot grading in this area has been designed to direct runoff only from rear-yards, which generally consist of grassed areas. It is our understanding that the Owner currently draws water from Lake Erie via a pump to maintain a permanent pool as the water within the SWMF 'E' is used for golf course irrigation. The direct runoff from the rear-yards provides clean water flows to supplement the irrigation requirements utilized from the pond. Refer to Summary of Flows Table 2 in Appendix B for a summary of peak flows directed to the Ex. SWMF 'E' from the 0.79 ha rear-yard area.

Erosion and Sediment Control

Erosion and Sediment Control (ESC) measures are to be used throughout the construction process to help stabilize the site and prevent migration of soil particles to neighbouring parcels and drainage corridors. ESC measures have been proposed and submitted as part of the engineering drawing set (Ref. sheet 15) which detail some of the periphery control measures proposed to remain in place for the duration of construction. Additional on-site measures will be required during various stages of construction; however, these measures are to be implemented as needed and are subject to the future Contractor's work plan, as the Contractor must be allowed to maintain control of the work and any temporary measures (Ref. OPSS.MUNI.100, Section GC 7.0).

Conclusion

We trust this Technical Memorandum and supporting appended documents address the stormwater management design updates required to support of the Site Plan Approval and proposed detailed design for Phases 4 of Dover Coast subdivision. If there are any questions, comments, or concerns, please do not hesitate to contact our firm.

Troy Winger, E.I.T.
Designer

Derek Hoevenaars, P.Eng.
Senior Project Engineer

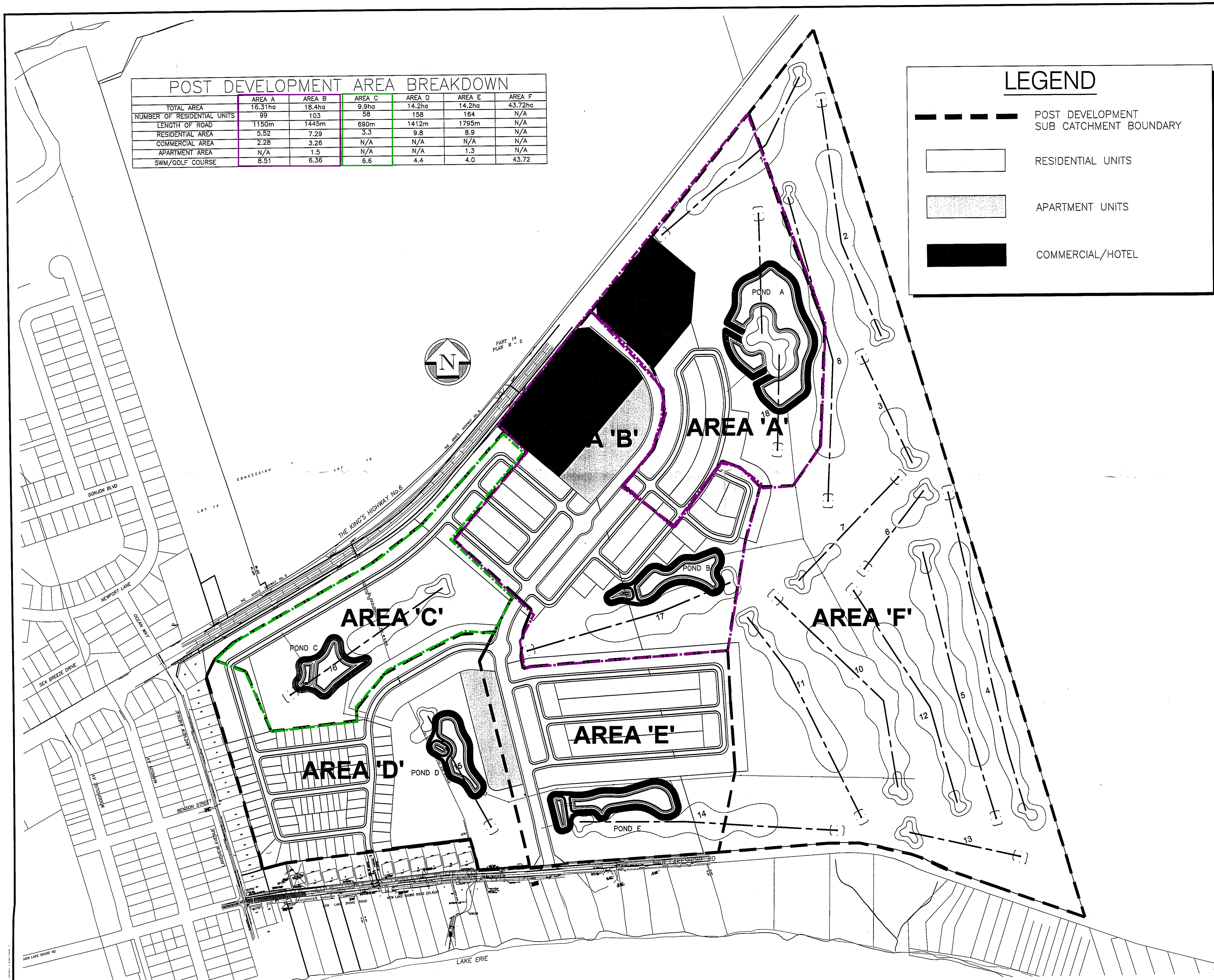
Submitted by:
Development Engineering (London) Limited

On Behalf of:
Ballantry Homes

Appendix A: Background Information

POST DEVELOPMENT AREA BREAKDOWN

	AREA A	AREA B	AREA C	AREA D	AREA E	AREA F
TOTAL AREA	16.31ha	18.4ha	9.9ha	14.2ha	14.2ha	43.72ha
NUMBER OF RESIDENTIAL UNITS	99	103	58	158	164	N/A
LENGTH OF ROAD	1150m	1445m	690m	1412m	1795m	N/A
RESIDENTIAL AREA	5.52	7.29	3.3	9.8	8.9	N/A
COMMERCIAL AREA	2.28	3.26	N/A	N/A	N/A	N/A
APARTMENT AREA	N/A	1.5	N/A	N/A	1.3	N/A
SWM/GOLF COURSE	8.51	6.36	6.6	4.4	4.0	43.72

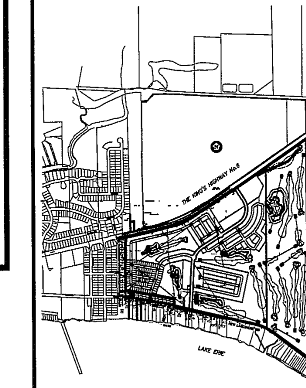


AREA 'A'
AREA 'B'
AREA 'C'
AREA 'D'
AREA 'E'
AREA 'F'
POND A
POND B
POND C
POND D
POND E
THE KING'S HIGHWAY No.6
CONCESSION 1
LOT 14
LOT 15
PART 14 PLAN R - 5
DONJON BLVD
NEWPORT LANE
OCEAN WAY
SEA BREEZE DRIVE
WOODHOUSE AV
MARDON AV
LAKEVIEW AVENUE
BENSON STREET
NEW LAKE SHORE ROAD
NEW LAKESHORE RD
NEW LAKE SHORE RD
LAKE ERIE
N

LEGEND

(heavy dashed line)	POST DEVELOPMENT SUB CATCHMENT BOUNDARY
(white box)	RESIDENTIAL UNITS
(stippled box)	APARTMENT UNITS
(black box)	COMMERCIAL/HOTEL

REV. No.	DATE	REVISION
0	JUNE 23/09	SWM REPORT



vallee

Consulting Engineers, Architects & Planners

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

Stamp: LICENSED PROFESSIONAL ENGINEER — T. G. SMITH — JUN 24/09 — PROVINCE OF ONTARIO

Project Title
DOVER COAST
SWM REPORT
PORT DOVER-NORFOLK COUNTY

Drawing Title
FIGURE 2
POST DEVELOPMENT DRAINAGE AREAS AND POND LOCATIONS

Designed by : TGS	Drawn By :
Checked by : TGS	Date Started : APRIL 2009
Drawing Scale : 1:3000	Drawing No. F2
Project No. 08-110	

LEGEND

- DENOTES DRAINAGE AREA BOUNDARY (PROPOSED DEVELOPMENT)
- DENOTES DRAINAGE AREA BOUNDARY (FUTURE DEVELOPMENT)
- DENOTES LIMITS OF EXISTING PHASE 1
- DENOTES LIMITS OF PROPOSED PHASE 2
- DRAINAGE AREA DESIGNATION

D10
DRAINAGE AREA (Ha) → 1.250Ha
C=0.50 ← RUN-OFF COEFFICIENT (C)

REFER TO SHEETS 4 & 5 FOR DETAILED STORM AREA PLANS.
REFER TO SHEET 9 FOR STORM DESIGN SHEET.

CONCESSION 2 WOODHOUSE

5.171Ha
AREA SUBJECT TO PRIVATE ONSITE SWM

BLACK CREEK

FUTURE SWMF

FUTURE DEVELOPMENT
35.869Ha
DEVELOPMENT OF LANDS NORTH OF HIGHWAY 6 TO INCLUDE SWMF

EXT.2
1.90Ha
C=0.30
EXTERNAL AREA TRIBUTARY TO SWMF B UNTIL LANDS NORTH OF HIGHWAY 6 ARE DEVELOPED

ELLWANGER MUNICIPAL DRAIN NO. 1 (BRANCH 1)

(BRANCH 2)

A21
FUTURE COMMERCIAL/HOTEL
2.441Ha
C=0.73

INTERCEPT EXISTING DRAIN AND DIRECT TO IRRIGATION POND A
INV=190.60±

EXISTING GOLF COURSE IRRIGATION POND (A)

ELLWANGER MUNICIPAL DRAIN NO. 1

A27
COMMERCIAL
2.436Ha
C=0.73

A22
0.135Ha
C=0.50

A23
0.119Ha
C=0.50

A24
0.091Ha
C=0.50

A25
0.093Ha
C=0.50

A26
0.198Ha
C=0.50

HIGHWAY 6

EXT.1
6.570Ha
C=0.28
EXTERNAL AREA TRIBUTARY TO SWMF 'C' UNTIL LANDS NORTH OF HIGHWAY 6 ARE DEVELOPED

A35
MED.CENTRE
0.990Ha
C=0.73

BARRETT COURT

A29
FUTURE NURSING HOME
1.156Ha
C=0.73

A28
0.282Ha
C=0.50

A32
FUTURE RETIREMENT HOME
2.208Ha
C=0.73

A30
0.073Ha
C=0.5

A31
0.161Ha
C=0.5

A34
FUTURE PRIVATE RESIDENTIAL
8.150Ha
C=0.50

A33
0.275Ha
C=0.5

DOVER COAST BLVD EAST

ELLWANGER MUNICIPAL DRAIN NO. 7

INTERCEPT EXISTING DRAIN AND DIRECT TO IRRIGATION SWMF C

SCHOONER DRIVE

A7 0.600Ha C=0.45
A8 0.273Ha C=0.45
A9 0.528Ha C=0.45
A5 0.675Ha C=0.45
A6 0.528Ha C=0.45

HW1

PROP. SWMF C

A10
0.916Ha
C=0.50

HW2

PROP. SWMF B

A1 0.648Ha C=0.45
A2 0.358Ha C=0.45
A3 0.288Ha C=0.45
A4 0.171Ha C=0.45

INTERCEPT EXISTING DRAIN AND DIRECT TO IRRIGATION SWMF B

0.610Ha C=0.45
0.650Ha C=0.45

VIKING LANE

EXISTING PHASE 1

GAMBLE LANE

REGATTA DRIVE

SCHOONER DRIVE

0.230Ha C=0.45

0.210Ha C=0.45

EXISTING SWMF D (DOVER COAST PHASE 1)

FUTURE PRIVATE CLUBHOUSE
A16
1.260Ha
C=0.73

A11
0.088Ha
C=0.50

A13
0.167Ha
C=0.50

A12
FUTURE PRIVATE RESIDENTIAL
4.454Ha
C=0.45

A14
0.165Ha
C=0.50

A15
FUTURE PRIVATE RESIDENTIAL
4.224Ha
C=0.45

DOVER COAST BOULEVARD

A17
0.169Ha
C=0.50

HW3

EXISTING SWMF E (DOVER COAST PHASE 1)

A18
0.255Ha
C=0.50

ELLWANGER MUNICIPAL DRAIN NO. 7

NEWPORT LANE

OCEAN WAY

SEA BREEZE DRIVE

SOMERSET DRIVE

HAMILTON PLANK ROAD (HIGHWAY 6)

WOODHOUSE AVENUE

MARDEN AVENUE

LAKEVIEW AVENUE

DONJON BOULEVARD

BENSON STREET

PORT DOVER WATER TOWER

PORT DOVER WASTE WATER TREATMENT PLANT

NEW LAKESHORE ROAD

NEW LAKESHORE ROAD

EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION

DETAILS	No.	REVISIONS	DATE	CONSULTANT
DESIGN BY JR	1	FIRST SUBMISSION TO COUNTY	MARCH 06/15	DE(L)L
DRAWN BY JR	2	SECOND SUBMISSION TO COUNTY	OCT. 29/15	DE(L)L
CHECKED BY JF	3	REVISED PER COUNTY COMMENTS	JUNE 01/16	DE(L)L
F.B.K. 1054	4	ISSUED FOR APPROVAL	OCT. 14/16	DE(L)L
	5	ADDED MEDICAL CENTRE	JUNE 20/2017	DE(L)L
FILE: DEL13-124 MASTER SERVICING.DWG				

CONSULTANT OR DIVISION

Consulting Civil Engineers
41 Adelaide St. N., Unit 71
London, Ontario N6B 3P4
Phone (519) 672-8310
Fax (519) 672-4182
e-mail: deveng@deveng.net

development engineering (London) Limited
CONSULTING CIVIL ENGINEERS

ENGINEER'S STAMP
LICENSED PROFESSIONAL ENGINEER
L.R. MURRAY
100142248
27 JJ '17
PROVINCE OF ONTARIO

Norfolk COUNTY

SCALE
SCALE - 1:3000
30 0 60m

TITLE
DOVER COAST - MUNICIPAL WORKS
PORT DOVER, ONTARIO

MASTER STORM AREA PLAN

PROJECT No. DEL13-124
SHEET No. M1
PLAN FILE No.

jones JUL27/17-11:29am DEL13-124 Master Servicing.dwg

RUNOFF COEFFICIENT 'C'

PARKS & PLAYGROUNDS	0.2
RESIDENTIAL - SINGLE/SEMI	0.45
COMMERCIAL & INDUSTRIAL	0.65

FLOW Q = 2.78 ACI
WHERE Q = PEAK FLOW IN LITRES PER SECOND (l/s)
A = AREA IN HECTARES (ha)
C = RUNOFF COEFFICIENT
i = RAINFALL INTENSITY IN MILLIMETERS PER HOUR (mm/hr)
RETURN PERIOD 5 YEARS

STORM SEWER DESIGN SHEET

NORFOLK COUNTY

(BASED ON NORFOLK COUNTY 5-YR STORM)

PROJECT: Dover Coast
FILE No. DEL13-124

DESIGNED BY: JR
CHECKED BY: LM/LJ
DATE: June 20, 2017

SEWER LOCATION			AREA			A X C						RAINFALL INTENSITY					SLOPE									PROFILE				VELOCITY (BASED ON ACTUAL FLOWS)						
STREET	FROM	TO	AREA NUMBER	AREA ha.	TOTAL AREA ha.	RUNOFF COEFF.	INCR AxC	TOTAL SECTION AxC A X C	TOTAL LAT. A X C	TOTAL SEWER A x C	TOTAL SEW. 2.78 x AxC	TIME ENT. SECT. min.	MIN. ACCUM. min.	INTENS. 'i' mm/hr	TOTAL Q l/s	PIPE Dia mm	FRICTION %	ENERGY M	ENERGY %	E + F %	FINAL SLOPE	N	ACTUAL CAP. l/s	VELOCITY m./s.	LENGTH m	TIME OF FLOW minutes	MANHOLE LOSSES m	SEWER FALL m	INVERT U.S. m	ELEV. D.S. m	Q_{ACT} (m^3/s)	Pipe Dia. (mm)	Pipe Slope %	Q_{FULL} (m^3/s)	V_{FULL} (m/s)	Q_{ACT} T / Q_{FULL}	V_{ACT} (m/s)
Regatta Drive	ST36	ST35	A1	0.649	0.649	0.45	0.292	0.000		0.292	0.812	0.00	15.00	76.40	62.04	300	0.412	0.000	0.000	0.412	0.50	0.013	68.38	1.110	47.50	0.71		0.238	189.272	189.035	0.062	300	0.500	0.068	0.967	0.907	1.110
Regatta Drive	ST35	ST34	A2	0.358	1.007	0.45	0.161	0.292		0.453	1.260	0.71	15.71	74.35	93.68	300	0.939	0.000	0.000	0.939	0.95	0.013	94.25	1.569	44.00	0.47		0.418	189.005	188.587	0.094	300	0.950	0.094	1.333	0.994	1.569
Regatta Drive	ST34	ST33	A3	0.268	1.275	0.45	0.121	0.453		0.574	1.595	0.47	16.18	73.07	116.54	375	0.442	0.000	0.000	0.442	0.50	0.013	123.96	1.303	33.00	0.42		0.165	188.512	188.347	0.117	375	0.500	0.124	1.122	0.940	1.303
Regatta Drive	ST33	EX. STMH	A4	0.171	1.446	0.45	0.077	0.574		0.651	1.809	0.42	16.60	71.96	130.18	375	0.552	0.000	0.000	0.552	0.60	0.013	135.79	1.436	30.10	0.35	0.326	0.181	188.317	188.136	0.130	375	0.600	0.136	1.230	0.959	1.436
															*(includes 453.5 l/s from Phase 1, 289 l/s from SWMF C & 170 l/s (100yr from SWMF C) ref. Vallee design)																						
Schooner Drive	ST10	ST9	A5	0.675	0.675	0.45	0.304			0.304	0.844	0.00	15.00	76.40	64.48	300	0.445	0.000	0.000	0.445	0.50	0.013	68.38	1.124	42.60	0.63		0.213	189.743	189.530	0.064	300	0.500	0.068	0.967	0.943	1.124
Schooner Drive	ST9	ST8	A6	0.528	1.203	0.45	0.238	0.304		0.541	1.505	0.63	15.63	74.58	112.24	375	0.410	0.000	0.000	0.410	0.40	0.013	110.87	1.182	80.00	1.13		0.320	189.460	189.140	0.112	375	0.400	0.111	1.004	1.012	1.182
Storm Outlet - SWMF D	EX. STMH	SWMF D			1.446			0.651		0.651	1.809	0.35	16.95	71.07	1041.07	900	0.331	0.000	0.000	0.331	0.40	0.013	1144.93	2.066	113.10	0.91		0.452	187.611	187.130	1.041	900	0.400	1.145	1.800	0.909	2.066
Schooner Drive	ST13	ST12	A7	0.820	0.820	0.45	0.369			0.369	1.026	0.00	15.00	76.40	78.39	300	0.657	0.000	0.000	0.657	0.66	0.013	78.56	1.308	58.20	0.74		0.384	190.311	189.926	0.078	300	0.660	0.079	1.111	0.998	1.308
Schooner Drive	ST12	ST11	A8	0.273	1.093	0.45	0.123	0.369		0.492	1.367	0.74	15.74	74.27	101.53	375	0.335	0.000	0.000	0.335	0.40	0.013	110.87	1.155	58.20	0.84		0.233	189.851	189.618	0.102	375	0.400	0.111	1.004	0.916	1.155
Schooner Drive	ST14	ST11	A9	0.928	0.928	0.45	0.418			0.418	1.161	0.00	15.00	76.40	88.70	375	0.256	0.000	0.000	0.256	0.60	0.013	135.79	1.331	88.10	1.10	0.279	0.529	190.225	189.696	0.089	375	0.600	0.136	1.230	0.653	1.331
EXTERNAL	EXT.	ST11	EXT.1	6.570	6.570	0.28	1.840			1.840	5.114	45.00	45.00	38.35	196.10	450	0.473	0.000	0.000	0.473	0.50	0.013	201.60	1.486	10.00	0.11	0.279	0.050	189.850	189.800	0.196	450	0.500	0.202	1.267	0.973	1.486
Storm Outlet - SMWF C	ST11	HW1			8.591					2.749	7.642	0.11	35.38	44.88	342.99	675	0.166	0.000	0.000	0.166	0.65	0.013	677.71	1.911	106.70	0.93		0.694	189.390	188.700	0.343	675	0.650	0.678	1.894	0.506	1.911
DOVER COAST BOULEVARD	ST7	ST6	A10	0.916	0.916	0.50	0.458			0.458	1.273	0.00	15.00	76.40	97.26	375	0.308	0.000	0.000	0.308	0.50	0.013	123.96	1.245	43.90	0.59		0.220	189.680	189.460	0.097	375	0.500	0.124	1.122	0.785	1.245
DOVER COAST BOULEVARD	ST6	ST5	A11	0.088	1.004	0.50	0.044	0.458		0.502	1.396	0.59	15.59	74.69	104.27	375	0.354	0.000	0.000	0.354	0.50	0.013	123.96	1.260	39.90	0.53		0.200	189.430	189.231	0.104	375	0.500	0.124	1.122	0.841	1.260
DOVER COAST BOULEVARD	STUB	ST5	A12	4.454	4.454	0.45	2.004			2.004	5.572	0.00	20.00	64.31	358.35	600	0.341	0.000	0.000	0.341	0.50	0.013	434.16	1.717	11.10	0.11		0.056	189.065	189.009	0.358	600	0.500	0.434	1.535	0.825	1.717
DOVER COAST BOULEVARD	ST5	ST4	A13	0.167	5.625	0.50	0.084	2.004	0.502	2.590	7.200	0.11	20.11	64.10	461.50	675	0.301	0.000	0.000	0.301	0.50	0.013	594.39	1.839	72.40	0.66		0.362	188.934	188.572	0.461	675	0.500	0.594	1.661	0.776	1.839
DOVER COAST BOULEVARD	ST4	ST3	A14	0.165	5.790	0.50	0.083	2.590		2.672	7.429	0.66	20.77	62.84	466.85	675	0.308	0.000	0.000	0.308	0.60	0.013	651.13	1.996	72.40	0.60		0.434	188.542	188.105	0.467	675	0.600	0.651	1.819	0.717	1.996
DOVER COAST BOULEVARD	STUB	ST3	A15	4.224	4.224	0.45	1.901			1.901	5.284	0.00	20.00	64.31	339.83	600	0.306	0.000	0.000	0.306	0.50	0.013	434.16	1.702	11.10	0.11		0.056	188.236	188.180	0.340	600	0.500	0.434	1.535	0.783	1.702
DOVER COAST BOULEVARD	STUB	ST3	A16	1.260	1.260	0.73	0.920			0.920	2.557	0.00	15.00	76.40	195.36	450	0.470	0.000	0.000	0.470	1.00	0.013	285.10	1.955	15.40	0.13		0.154	188.484	188.330	0.195	450	1.000	0.285	1.793	0.685	1.955
DOVER COAST BOULEVARD	ST3	ST1	A17	0.169	11.443	0.50	0.085	0.920	4.573	5.577	15.505	0.11	20.11	64.10	993.82	825	0.480	0.000	0.000	0.480	0.70	0.013	1200.61	2.514	71.10	0.47	0.349	0.498	187.960	187.461	0.994	825	0.700	1.201	2.247	0.828	2.514
DOVER COAST BOULEVARD	ST2	ST1	A18	0.255	0.255	0.50	0.128			0.128	0.354	0.00	15.00	76.40	27.05	300	0.078	0.000	0.000	0.078	0.50	0.013	68.38	0.892	25.40	0.47	0.349	0.127	187.853	187.726	0.027	300	0.500	0.068	0.967	0.396	0.892
Storm Outlet - SWMF E	ST1	HW3			11.698			5.577	0.128	5.705	15.860	0.47	20.44	63.46	1006.50	900	0.309	0.000	0.000	0.309	0.45	0.013	1214.39	2.136	15.40	0.12		0.069	187.169	187.100	1.006	900	0.450	1.214	1.909	0.829	2.136
Schooner Drive	ST20	ST19	A19	0.633	0.633	0.45	0.285			0.285	0.792	0.00	15.00	76.40	60.51	300	0.392	0.000	0.000	0.392	0.50	0.013	68.38	1.101	46.10	0.70		0.231	190.360	190.130	0.061	300	0.500	0.068	0.967	0.885	1.101
Schooner Drive	ST19	ST16	A20	0.371	1.004	0.45	0.167	0.285		0.452	1.256	0.70	15.70	74.38	93.42	450	0.107	0.000	0.000	0.107	0.50	0.013	201.60	1.239	46.10	0.62		0.231	189.980	189.751	0.093	450	0.500	0.202	1.267	0.463	1.239
Schooner Drive	ST16	ST18	A20a	0.367	1.371	0.45	0.165	0.452		0.617	1.715	0.62	16.32	72.70	124.67	450	0.191	0.000	0.000	0.191	0.50	0.013	201.60	1.358	58.00	0.71		0.290	189.700	189.409	0.125	450	0.500	0.202	1.267	0.618	1.358
DOVER COAST BOULEVARD	ST30	ST29	A21	2.441	2.441	0.73	1.782			1.782	4.954	0.00	15.00	76.40	378.50	600	0.380	0.000	0.000	0.380	0.50	0.013	434.16	1.740	61.60	0.59		0.308	191.278	190.970	0.378	600	0.500	0.434	1.535	0.872	1.740
DOVER COAST BOULEVARD	ST29	ST28	A22	0.135	2.576	0.50	0.068	1.782		1.849	5.141	0.59	15.59	74.69	383.98	600	0.391	0.000	0.000	0.391	0.40	0.013	388.33	1.615	60.80	0.63		0.243	190.943	190.700	0.384	600	0.400	0.388	1.373	0.989	1.615
DOVER COAST BOULEVARD	ST28	ST27	A23	0.119	2.695	0.50	0.060	1.849		1.909	5.307	0.63	16.22	72.96	387.20	600	0.398	0.000	0.000	0.398	0.50	0.013	434.16	1.752	51.60	0.49		0.258	190.668	190.410	0.387	600	0.500	0.434	1.535	0.892	1.752
DOVER COAST BOULEVARD	ST27	ST26	A24	0.091	2.786	0.50	0.046	1.909		1.954	5.433	0.49	16.71	71.71	389.59	675	0.215	0.000	0.000	0.215	0.22	0.013	394.28	1.296	47.70	0.61		0.105	190.335	190.230	0.390	675	0.220	0.394	1.102	0.988	1.296
DOVER COAST BOULEVARD	ST26	ST25	A25	0.093	2.879	0.50	0.047	1.954		2.001	5.563	0.61	17.32	70.19	390.45	675	0.216	0.000	0.000	0.216	0.22	0.013	394.28	1.296	40.80	0.52		0.090	190.200	190.110	0.390	675	0.220	0.394	1.102	0.990	1.296
DOVER COAST BOULEVARD	ST25	ST24	A26	0.198	3.077	0.50	0.099	2.001		2.100	5.838	0.52	17.84	68.95	402.54	675	0.229	0.000	0.000	0.229	0.20	0.013	375.93	1.200	89.00	1.24		0.178	190.083	189.905	0.403	675	0.200	0.376	1.050	1.071	1.200
EXTERNAL	ST40	ST39	EXT.2	1.900	1.900	0.30	0.570	0.000		0.570	1.585	0.00	30.00	49.90	79.09	450	0.077	0.000	0.000	0.077	0.25	0.013	142.55	0.933	70.00	1.25		0.175	190.600	190.425	0.079	450	0.250	0.143	0.896	0.555	0.933
	ST39	ST43			1.900			0.570		0.570	1.585	1.24	31.24	48.62	77.07	450	0.073	0.000	0.000	0.073	0.25	0.013	142.55	0.925	50.10	0.90		0.125	190.390	190.198	0.077	450	0.250	0.143	0.896	0.541	0.925
	ST43	ST38	A35	0.990	2.890	0.73	0.723	0.570		1.293	3.594	1.25	32.49	47.42	170.44	525	0.157	0.000	0.000	0.157	0.20	0.013	192.35	1.011	26.70	0.44		0.053	190.390	190.198	0.170	525	0.200	0.192	0.888	0.886	1.011
COMMERCIAL	STUB	ST38	A27	2.436	2.436	0.73	1.778			1.778	4.944	1.25	15.00	76.40	377.73	675	0.202	0.000	0.000	0.202	0.50	0.013	594.39	1.789	18.60	0.17		0.093	190.368	190.275	0.378	675	0.500	0.594	1.661	0.636	1.789
BARRETT COURT	ST38	ST37	A28	0.282	5.608	0.50	0.141	1.778	1.293	3.212	8.929	0.44	* 20.69	62.99	562.44	825	0.154	0.000	0.000	0.154	0.20	0.013	641.75	1.363	95.90	1.17		0.192	190.047	189.855	0.562	825	0.200	0.642	1.201	0.876	1.363
NURSING HOME	STUB	ST37	A29	1.356	1.356	0.73	0.990			0.990	2.752	0.00	15.00	76.40	210.26	525	0.239	0.000	0.000	0.239	0.50	0.013	304.13	1.534	9.40	0.10		0.047	190.202	190.155	0.210	525	0.500	0.304	1.405	0.691	1.534
BARRETT COURT	ST37	ST24	A30	0.073	7.037	0.50	0.037	3.212	0.990	4.238	11.783	1.17	21.86	60.89	717.49	900	0.157	0.000	0.000	0.157	0.25	0.013	905.15	1.580	40.00	0.42		0.100	189.780	189.680	0.717	900	0.250	0.905	1.423	0.793	1.580
DOVER COAST BOULEVARD	ST24	ST23	A31	0.161	10.275	0.50	0.081	4.238	2.100	6.419	17.844	1.24	**21.13	62.18	1109.55	975	0.245	0.000	0.000	0.245	0.25	0.013	1124.97	1.771	84.20	0.79		0.212	189.607	189.395	1.110	975	0.252	1.125	1.507	0.986	1.771
RETIREMENT HOME	STUB	ST23	A32	2.208	2.208	0.73	1.612			1.612	4.481	0.00	15.00	76.40	342.36	600	0.311	0.000	0.000	0.311	0.50	0.013	434.16	1.704	15.40	0.15			189.847	189.770	0.342	600	0.500	0.434	1.535	0.789	1.704
DOVER COAST BOULEVARD	ST23	ST18	A33	0.275	12.758	0.50	0.138	1.612	6.419	8.168	22.707	0.79	21.92	60.81	1380.72	1050	0.256	0.000	0.000	0.256	0.29	0.013	1470.69	1.970	100.00	0.85			189.320	189.030	1.381	1050	0.290	1.470	1.698	0.939	1.970
	ST18	ST17	A34	8.150	22.279	0.50	4.075	8.168	0.617	12.860	35.751	0.79	22.71	59.49	2126.69	1200	0.298	0.000	0.000	0.298	0.40	0.013	2465.94	2.463	46.30	0.31	0.185	188.785	188.600	2.127	1200	0.400	2.466	2.180	0.863	2.463
Storm Outlet - SWMF B	ST17	HW2			22.279						35.751	0.31	23.02	58.99	2108.84	1200	0.293	0.000	0.000	0.293	0.40	0.013	2465.94	2.458	18.30	0.12	0.073	188.573	188.500	2.109	1200	0.400	2.466	2.180	0.855	2.458

*T_c = $\frac{(T_{c1} * Q_1) + (T_{c2} * Q_2)}{(Q_1 + Q_2)}$

= $\frac{(32.93 \times 170.44) + (15.17 \times 377.73)}{(170.44 + 377.73)}$

= 20.69 min

T_{c1} = 17.84 + 1.24
= 32.93

T_{c2} = 15.00 + 0.17
= 15.17

**T_c = $\frac{(T_{c1} * Q_1) + (T_{c2} * Q_2)}{(Q_1 + Q_2)}$

= $\frac{(19.08 \times 402.54) + (22.28 \times 717.49)}{(402.54 + 717.49)}$

= 21.13 min

T_{c1} = 17.84 + 1.24
= 19.08

T_{c2} = 21.86 + 0.42
= 22.28

EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION

DETAILS	No.	REVISIONS	DATE	CONSULTANT
DESIGN BY JR	1	FIRST SUBMISSION TO COUNTY	MARCH 06/15	DE(L)L
DRAWN BY JR	2	SECOND SUBMISSION TO COUNTY	OCT. 29/15	DE(L)L
CHECKED BY JF	3	REVISED PER COUNTY COMMENTS	JUNE 01/16	DE(L)L
F.B.K. 1054	4	ISSUED FOR APPROVAL	OCT. 14/16	DE(L)L
	5	ADDED MEDICAL CENTRE	JUNE 20/2017	DE(L)L
FILE: DEL13-124 MASTER SERVICING.DWG				

CONSULTANT OR DIVISION

Consulting Civil Engineers
41 Adelaide St. N., Unit 71
London, Ontario N6B 3P4
Phone (519) 672-8310
Fax (519) 672-4182
e-mail: deveng@deveng.net

development engineering (London) Limited
CONSULTING CIVIL ENGINEERS

ENGINEER'S STAMP
LICENSED PROFESSIONAL ENGINEER
L.R. MURRAY
100142415
15 Jun 17
PROVINCE OF ONTARIO

Norfolk County

SCALE

TITLE
DOVER COAST – MUNICIPAL WORKS
PORT DOVER, ONTARIO

MASTER STORM DESIGN SHEET

PROJECT No. DEL13-124
SHEET No. M9
PLAN FILE No.

J:\dwr\land Jun.20/17-11:59pm DEL13-124 Master Servicing.dwg

LEGEND

- Subject Boundary
- Townhouse Units

AREA STATISTICS

Residential Single Detached (16.15m Lots)		4.21 ha
Townhouse Units (9.20m Lots - Blocks 4-14)		1.64 ha
Park (Block 2)		1.44 ha
Path (Block 1, 3)		0.03 ha
R.O.W. (Street A - Street D)		1.36 ha
Gross Area:		8.68 ha

UNIT COUNT

Residential Single Detached (16.15m Lots)	73
Townhouse Units (9.20m Lots - Blocks 4-14)	48
Total Lots	121

NOTES:
All measurements are in meters.

SURVEYOR'S CERTIFICATE

I hereby certify that the boundaries of the land to be subdivided as shown on this plan, and their relationship to the adjacent lands are accurately and correctly shown.

Waldemar Golinski O.L.S. Signature Day Month Year

OWNERS AUTHORIZATION

We, 2079095 Ontario Ltd. (Dover Coast) owner, hereby authorize BLACKTHORN DEVELOPMENT CORP. to prepare and submit a draft plan of subdivision for approval.

John Lennox
Dover Coast
Signature Day Month Year

KEY PLAN

Subject Boundary

Metric Scale
0 500 1000

0 15 30 45 60
metric scale

DRAFT OF SUBDIVISION OPTION 1

Part of Lot 15 and 16, Concession 1
(Geographic Township of Woodhouse)
Norfolk County

Dover Coast Blvd.

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

A. The boundaries of the land proposed to be subdivided, certified by an Ontario land surveyor;
D. The purpose for which the proposed lots are to be used; Residential Single Family and Townhomes.
E. The existing uses of all adjoining lands;
H. The availability and nature of domestic water supplies;
J. Existing contours or elevations as may be required to determine the grade of the highways and the drainage of the land proposed to be subdivided;
K. The municipal services available or to be available to the land proposed to be subdivided;

BLACKTHORN Development Corp.

Land Development | Land Use Planning | Project Management | Government Relations

1:800	March 25, 2025	2445-21		JD
Scale	Date	Drawing Number	Rev.	Drawn

Appendix B: SWM Figures and Calculations

development engineering (London) Limited

CONSULTING CIVIL ENGINEERS

DEL13-124P4: DOVER COAST PHASE 4

ALLOWABLE CONDITIONS DRAINAGE SCHEMATIC

PREPARED BY: T. WINGER

SCALE - 1:1500

REGATTA DRIVE

DOVER COAST BOULEVARD

EX. SWMF 'E'

A1
8.68Ha
36%
C=0.45

LEGEND:

CATCHMENT AREA ID ⟶ A1
6.65 Ha ⟵ AREA (HECTARES)
IMPERVIOUSNESS ⟶ 0%
C=0.20 ⟵ RUNOFF COEF.

DENOTES LIMIT OF ALLOWABLE CATCHMENT AREA

DENOTES MINOR FLOW DIRECTION

DENOTES MAJOR FLOW DIRECTION

DENOTES ALLOWABLE SITE AREA TRIBUTARY TO SWMF 'E' VIA DOVER COAST BOULEVARD

development engineering (London) Limited

CONSULTING CIVIL ENGINEERS

DEL13-124P4: DOVER COAST PHASE 4

POST-DEVELOPMENT DRAINAGE SCHEMATIC

PREPARED BY: T. WINGER

SCALE - 1:1500

REGATTA DRIVE

DOVER COAST BOULEVARD

PROP. SWM RETENTION AREA

EX. SWMF 'E'

P1
2.33 Ha
50%
C=0.55

P2
3.02 Ha
59%
C=0.61

P3
2.54 Ha
23%
C=0.36

P4
0.79 Ha
28%
C=0.40

LEGEND:

CATCHMENT AREA ID ⟶ P1
6.65 Ha ⟵ AREA (HECTARES)
IMPERVIOUSNESS ⟶ 0%
C=0.20 ⟵ RUNOFF COEF.

DENOTES MINOR FLOW DIRECTION

DENOTES MAJOR FLOW DIRECTION

DENOTES LIMIT OF CATCHMENT AREA TRIBUTARY TO DOVER COAST BOULEVARD

DENOTES LIMIT OF CATCHMENT AREA TRIBUTARY TO DOVER COAST BOULEVARD VIA SWMF DRY BASIN

DENOTES LIMIT OF CATCHMENT AREA DIRECTING RUNOFF TO EX. SWMF 'E'

development engineering (London) Limited
CONSULTING CIVIL ENGINEERS

Project: DEL13-124P4 - Dover Coast Phase 4
Prepared by: Troy Winger, E.I.T.
Reviewed by: Derek Hoevenaars, P.Eng
Date: July 18, 2025

Table 1: Site Characteristics

Runoff Area	Area (m^2)	Area (Ha)	Imp. Area (m^2)	Imperv. (%)	Runoff Coeff. (C)
Allowable Conditions					
A1 - Allowable Portion of Site to Ex. SWMF	86,783	8.678	30,994	36%	0.45
Total Tributary Area =	**86,783**	**8.678**	**30,994**	**36%**	**0.45**
Proposed Catchment Areas					
P1 - Area to Ex. ST5	23,261	2.326	11,702	50%	0.55
P2 - Area to Ex. ST3	30,235	3.024	17,871	59%	0.61
P3 - Park & Rear-yards (to attenuation basin)	25,374	2.537	5,745	23%	0.36
Total Subject Site Area Tributary to Dover Coast Boulevard =	*78,871*	*7.887*	*35,318*	*45%*	*0.51*
P4 - South Rear-yards	7,912	0.791	2,232	28%	0.40
Total Area Tributary Directly to Ex. SWMF 5 =	*7,912*	*0.791*	*2,232*	*28%*	*0.40*
Total Tributary Area =	**86,783**	**8.678**	**37,550**	**43%**	**0.50**

development engineering (London) Limited
CONSULTING CIVIL ENGINEERS

Project: DEL13-124P4 - Dover Coast Phase 4
Prepared by: Troy Winger, E.I.T.
Reviewed by: Derek Hoevenaars, P.Eng
Date: July 18, 2025

Table 2: Summary of Flows

Allowable Conditions Area =	8.68	Ha	Proposed Conditions =	8.68	Ha
Runoff Coefficient =	0.45	C	Runoff Coefficient =	0.50	C
% Imperviousness =	36%	%	% Imperviousness =	43%	%

Storm Event	Allowable Conditions	Proposed Conditions										
	Allowable Peak Site Outflow(L/s)	Site Peak Runoff Rate (L/s)	Dry Basin Attenuation (m^3)	Maximum Basin Stage (Geodetic mASL)	Max. Depth of Storage in Basin (m)	Peak Low-Flow Discharge from Dry Basin (L/s)	Peak High-Flow Discharge from Dry Basin (L/s)	Peak Overland Flow from Dry Basin (L/s)	Peak Outflow from P1 to Dover Coast Blvd. (L/s)	Peak Outflow from P2 to Dover Coast Blvd. (L/s)	Peak Rear-Yard Outflow to Ex. SWMF 'E' (L/s)**	Peak Outflow to Dover Coast Blvd. (L/s) ***
2 year	467	643	63	189.11	0.34	44	0	0	186	238	61	461
5 year	698	950	100	189.22	0.45	53	0	0	276	361	92	680
10 year	855	1,168	150	189.35	0.58	63	0	0	337	444	120	828
25 year	1071	1,483	188	189.44	0.67	67	36	0	421	559	167	1032
50 year	1241	1,735	202	189.47	0.70	67	78	0	487	649	207	1191
100 year	1415	1,999	215	189.49	0.72	67	125	0	555	742	249	1354
Hurricane Hazel	N/A	1,151	345	189.74	0.97	67	281	0	297	396	113	985

* Allowable Conditions Model calibrated to the 5-year design flow per Master Storm Design Sheet by DevEng (July 2017) for the Ultimate Dover Coast Subdivision. Flows to ST5 equal 358 L/s & flows to ST3 equal 340 L/s, for a total allocated site outflow of 698 L/s.

** Peak Rear-Yard Outflow to Existing SWMF 'E' is not included in the Total Peak Outflow to Dover Coast Boulevard.

*** The total peak site outflows presented in these tables are not a direct sum of the individual contributing flows due to their offset hydrograph peaks. The peak flow rates presented were obtained from composite outflow hydrographs.

Appendix C: Allowable Conditions Modeling

Legend

- Outfalls

Subcatchments

- < 20 %
- 20 - 40 %
- 40 - 60 %
- 60 - 80 %
- > 80 %
- Building

- BG - Allowable

N

100 m

```
[TITLE]
DEL13-124P4 - Allowable Conditions

[OPTIONS]
;;Options            Value
;;------------------ ------------
FLOW_UNITS           LPS
INFILTRATION         CURVE_NUMBER
FLOW_ROUTING         DYNWAVE
LINK_OFFSETS         ELEVATION
MIN_SLOPE            0
ALLOW_PONDING        YES
SKIP_STEADY_STATE    NO

START_DATE           04/10/2015
START_TIME           00:00:00
REPORT_START_DATE    04/10/2015
REPORT_START_TIME    00:00:00
END_DATE             04/12/2015
END_TIME             00:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          00:01:00
WET_STEP             00:01:00
DRY_STEP             00:01:00
ROUTING_STEP         1

INERTIAL_DAMPING     PARTIAL
NORMAL_FLOW_LIMITED  BOTH
FORCE_MAIN_EQUATION  H-W
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         0
MAX_TRIALS           8
HEAD_TOLERANCE       0.0015
SYS_FLOW_TOL         5
LAT_FLOW_TOL         5
MINIMUM_STEP         0.5
THREADS              2

[EVAPORATION]
;;Type          Parameters
;;------------- ----------
CONSTANT         0.0
DRY_ONLY         NO

[RAINGAGES]
;;               Rain      Time     Snow     Data
;;Name           Type      Intrvl   Catch    Source
;;-------------- --------- -------- -------- ----------
Norfolk          INTENSITY 0:05     1.0      TIMESERIES Norfolk-100yr

[SUBCATCHMENTS]
;;                                            Total    Pcnt.            Pcnt.    Curb     Snow
;;Name           Raingage         Outlet       Area     Imperv   Width   Slope    Length   Pack
;;-------------- ---------------- ------------ -------- -------- ------- -------- -------- --------
A1               Norfolk          OF1          8.678    36       218.589 0.25     0

[SUBAREAS]
;;Subcatchment   N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-------------- ---------- ---------- ---------- ---------- ---------- ---------- ----------
A1               0.012      0.24       2          5          25         OUTLET

[INFILTRATION]
;;Subcatchment   CurveNum   HydCon     DryTime
;;-------------- ---------- ---------- ----------
A1               82         12.7       7
```

DEL13-124P4 – Dover Coast Subdivision Phase 4
Allowable Conditions PCSWMM Input

```
[OUTFALLS]
;;               Invert     Outfall    Stage/Table      Tide
;;Name           Elev.      Type       Time Series      Gate     Route To
;;-------------- ---------- ---------- ---------------- -------- ----------------
OF1              0          FREE                        NO

[TIMESERIES]
;;Name           Date       Time       Value
;;-------------- ---------- ---------- ----------
Hurricane_Hazel_48            0          2.0278
Hurricane_Hazel_48            1          2.0278
Hurricane_Hazel_48            2          2.0278
Hurricane_Hazel_48            3          2.0278
Hurricane_Hazel_48            4          2.0278
Hurricane_Hazel_48            5          2.0278
Hurricane_Hazel_48            6          2.0278
Hurricane_Hazel_48            7          2.0278
Hurricane_Hazel_48            8          2.0278
Hurricane_Hazel_48            9          2.0278
Hurricane_Hazel_48            10         2.0278
Hurricane_Hazel_48            11         2.0278
Hurricane_Hazel_48            12         2.0278
Hurricane_Hazel_48            13         2.0278
Hurricane_Hazel_48            14         2.0278
Hurricane_Hazel_48            15         2.0278
Hurricane_Hazel_48            16         2.0278
Hurricane_Hazel_48            17         2.0278
Hurricane_Hazel_48            18         2.0278
Hurricane_Hazel_48            19         2.0278
Hurricane_Hazel_48            20         2.0278
Hurricane_Hazel_48            21         2.0278
Hurricane_Hazel_48            22         2.0278
Hurricane_Hazel_48            23         2.0278
Hurricane_Hazel_48            24         2.0278
Hurricane_Hazel_48            25         2.0278
Hurricane_Hazel_48            26         2.0278
Hurricane_Hazel_48            27         2.0278
Hurricane_Hazel_48            28         2.0278
Hurricane_Hazel_48            29         2.0278
Hurricane_Hazel_48            30         2.0278
Hurricane_Hazel_48            31         2.0278
Hurricane_Hazel_48            32         2.0278
Hurricane_Hazel_48            33         2.0278
Hurricane_Hazel_48            34         2.0278
Hurricane_Hazel_48            35         2.0278
Hurricane_Hazel_48            36         6
Hurricane_Hazel_48            37         4
Hurricane_Hazel_48            38         6
Hurricane_Hazel_48            39         13
Hurricane_Hazel_48            40         17
Hurricane_Hazel_48            41         13
Hurricane_Hazel_48            42         23
Hurricane_Hazel_48            43         13
Hurricane_Hazel_48            44         13
Hurricane_Hazel_48            45         53
Hurricane_Hazel_48            46         38
Hurricane_Hazel_48            47         13
Hurricane_Hazel_48            48         0

Norfolk-100yr                 0:00       9.376
Norfolk-100yr                 0:05       9.856
Norfolk-100yr                 0:10       10.403
Norfolk-100yr                 0:15       11.033
Norfolk-100yr                 0:20       11.77
Norfolk-100yr                 0:25       12.645
Norfolk-100yr                 0:30       13.704
Norfolk-100yr                 0:35       15.02
Norfolk-100yr                 0:40       16.71
Norfolk-100yr                 0:45       18.978
```

Norfolk-100yr	0:50	22.227
Norfolk-100yr	0:55	27.381
Norfolk-100yr	1:00	37.24
Norfolk-100yr	1:05	68.375
Norfolk-100yr	1:10	234.168
Norfolk-100yr	1:15	77.397
Norfolk-100yr	1:20	46.283
Norfolk-100yr	1:25	34.742
Norfolk-100yr	1:30	28.451
Norfolk-100yr	1:35	24.408
Norfolk-100yr	1:40	21.553
Norfolk-100yr	1:45	19.412
Norfolk-100yr	1:50	17.737
Norfolk-100yr	1:55	16.383
Norfolk-100yr	2:00	15.263
Norfolk-100yr	2:05	14.317
Norfolk-100yr	2:10	13.506
Norfolk-100yr	2:15	12.802
Norfolk-100yr	2:20	12.184
Norfolk-100yr	2:25	11.636
Norfolk-100yr	2:30	11.145
Norfolk-100yr	2:35	10.704
Norfolk-100yr	2:40	10.305
Norfolk-100yr	2:45	9.941
Norfolk-100yr	2:50	9.607
Norfolk-100yr	2:55	9.301
Norfolk-100yr	3:00	0
Norfolk-10yr	0:00	5.682
Norfolk-10yr	0:05	5.998
Norfolk-10yr	0:10	6.36
Norfolk-10yr	0:15	6.78
Norfolk-10yr	0:20	7.275
Norfolk-10yr	0:25	7.867
Norfolk-10yr	0:30	8.592
Norfolk-10yr	0:35	9.502
Norfolk-10yr	0:40	10.686
Norfolk-10yr	0:45	12.303
Norfolk-10yr	0:50	14.667
Norfolk-10yr	0:55	18.522
Norfolk-10yr	1:00	26.175
Norfolk-10yr	1:05	51.182
Norfolk-10yr	1:10	156.914
Norfolk-10yr	1:15	58.449
Norfolk-10yr	1:20	33.388
Norfolk-10yr	1:25	24.199
Norfolk-10yr	1:30	19.332
Norfolk-10yr	1:35	16.281
Norfolk-10yr	1:40	14.171
Norfolk-10yr	1:45	12.615
Norfolk-10yr	1:50	11.414
Norfolk-10yr	1:55	10.456
Norfolk-10yr	2:00	9.671
Norfolk-10yr	2:05	9.014
Norfolk-10yr	2:10	8.456
Norfolk-10yr	2:15	7.975
Norfolk-10yr	2:20	7.555
Norfolk-10yr	2:25	7.184
Norfolk-10yr	2:30	6.855
Norfolk-10yr	2:35	6.561
Norfolk-10yr	2:40	6.295
Norfolk-10yr	2:45	6.054
Norfolk-10yr	2:50	5.834
Norfolk-10yr	2:55	5.632
Norfolk-10yr	3:00	0
Norfolk-25yr	0:00	7.108
Norfolk-25yr	0:05	7.488
Norfolk-25yr	0:10	7.923

DEL13-124P4 – Dover Coast Subdivision Phase 4
Allowable Conditions PCSWMM Input

Norfolk-25yr	0:15	8.425
Norfolk-25yr	0:20	9.015
Norfolk-25yr	0:25	9.717
Norfolk-25yr	0:30	10.573
Norfolk-25yr	0:35	11.642
Norfolk-25yr	0:40	13.024
Norfolk-25yr	0:45	14.896
Norfolk-25yr	0:50	17.606
Norfolk-25yr	0:55	21.969
Norfolk-25yr	1:00	30.493
Norfolk-25yr	1:05	58.078
Norfolk-25yr	1:10	187.916
Norfolk-25yr	1:15	66.106
Norfolk-25yr	1:20	38.442
Norfolk-25yr	1:25	28.309
Norfolk-25yr	1:30	22.881
Norfolk-25yr	1:35	19.441
Norfolk-25yr	1:40	17.04
Norfolk-25yr	1:45	15.255
Norfolk-25yr	1:50	13.869
Norfolk-25yr	1:55	12.756
Norfolk-25yr	2:00	11.84
Norfolk-25yr	2:05	11.07
Norfolk-25yr	2:10	10.413
Norfolk-25yr	2:15	9.844
Norfolk-25yr	2:20	9.347
Norfolk-25yr	2:25	8.907
Norfolk-25yr	2:30	8.515
Norfolk-25yr	2:35	8.163
Norfolk-25yr	2:40	7.845
Norfolk-25yr	2:45	7.555
Norfolk-25yr	2:50	7.291
Norfolk-25yr	2:55	7.049
Norfolk-25yr	3:00	0
Norfolk-2yr	0:00	3.052
Norfolk-2yr	0:05	3.239
Norfolk-2yr	0:10	3.455
Norfolk-2yr	0:15	3.707
Norfolk-2yr	0:20	4.006
Norfolk-2yr	0:25	4.369
Norfolk-2yr	0:30	4.817
Norfolk-2yr	0:35	5.387
Norfolk-2yr	0:40	6.141
Norfolk-2yr	0:45	7.189
Norfolk-2yr	0:50	8.756
Norfolk-2yr	0:55	11.381
Norfolk-2yr	1:00	16.761
Norfolk-2yr	1:05	34.542
Norfolk-2yr	1:10	98.992
Norfolk-2yr	1:15	39.682
Norfolk-2yr	1:20	21.921
Norfolk-2yr	1:25	15.353
Norfolk-2yr	1:30	11.939
Norfolk-2yr	1:35	9.844
Norfolk-2yr	1:40	8.423
Norfolk-2yr	1:45	7.392
Norfolk-2yr	1:50	6.609
Norfolk-2yr	1:55	5.993
Norfolk-2yr	2:00	5.493
Norfolk-2yr	2:05	5.08
Norfolk-2yr	2:10	4.732
Norfolk-2yr	2:15	4.434
Norfolk-2yr	2:20	4.177
Norfolk-2yr	2:25	3.951
Norfolk-2yr	2:30	3.752
Norfolk-2yr	2:35	3.575
Norfolk-2yr	2:40	3.416
Norfolk-2yr	2:45	3.272

```
Norfolk-2yr             2:50       3.142
Norfolk-2yr             2:55       3.023
Norfolk-2yr             3:00       0

Norfolk-50yr            0:00       8.23
Norfolk-50yr            0:05       8.661
Norfolk-50yr            0:10       9.152
Norfolk-50yr            0:15       9.72
Norfolk-50yr            0:20       10.384
Norfolk-50yr            0:25       11.175
Norfolk-50yr            0:30       12.135
Norfolk-50yr            0:35       13.331
Norfolk-50yr            0:40       14.872
Norfolk-50yr            0:45       16.95
Norfolk-50yr            0:50       19.944
Norfolk-50yr            0:55       24.728
Norfolk-50yr            1:00       33.984
Norfolk-50yr            1:05       63.622
Norfolk-50yr            1:10       210.855
Norfolk-50yr            1:15       72.235
Norfolk-50yr            1:20       42.55
Norfolk-50yr            1:25       31.625
Norfolk-50yr            1:30       25.725
Norfolk-50yr            1:35       21.962
Norfolk-50yr            1:40       19.321
Norfolk-50yr            1:45       17.349
Norfolk-50yr            1:50       15.811
Norfolk-50yr            1:55       14.573
Norfolk-50yr            2:00       13.552
Norfolk-50yr            2:05       12.691
Norfolk-50yr            2:10       11.956
Norfolk-50yr            2:15       11.317
Norfolk-50yr            2:20       10.758
Norfolk-50yr            2:25       10.263
Norfolk-50yr            2:30       9.821
Norfolk-50yr            2:35       9.423
Norfolk-50yr            2:40       9.064
Norfolk-50yr            2:45       8.737
Norfolk-50yr            2:50       8.437
Norfolk-50yr            2:55       8.163
Norfolk-50yr            3:00       0

Norfolk-5yr             0:00       4.74
Norfolk-5yr             0:05       5.006
Norfolk-5yr             0:10       5.311
Norfolk-5yr             0:15       5.665
Norfolk-5yr             0:20       6.082
Norfolk-5yr             0:25       6.581
Norfolk-5yr             0:30       7.192
Norfolk-5yr             0:35       7.961
Norfolk-5yr             0:40       8.962
Norfolk-5yr             0:45       10.331
Norfolk-5yr             0:50       12.336
Norfolk-5yr             0:55       15.613
Norfolk-5yr             1:00       22.139
Norfolk-5yr             1:05       43.595
Norfolk-5yr             1:10       135.065
Norfolk-5yr             1:15       49.843
Norfolk-5yr             1:20       28.308
Norfolk-5yr             1:25       20.451
Norfolk-5yr             1:30       16.302
Norfolk-5yr             1:35       13.707
Norfolk-5yr             1:40       11.915
Norfolk-5yr             1:45       10.595
Norfolk-5yr             1:50       9.578
Norfolk-5yr             1:55       8.767
Norfolk-5yr             2:00       8.104
Norfolk-5yr             2:05       7.549
Norfolk-5yr             2:10       7.078
```

DEL13-124P4 – Dover Coast Subdivision Phase 4
Allowable Conditions PCSWMM Input

```
Norfolk-5yr             2:15       6.671
Norfolk-5yr             2:20       6.317
Norfolk-5yr             2:25       6.005
Norfolk-5yr             2:30       5.728
Norfolk-5yr             2:35       5.48
Norfolk-5yr             2:40       5.256
Norfolk-5yr             2:45       5.053
Norfolk-5yr             2:50       4.868
Norfolk-5yr             2:55       4.698
Norfolk-5yr             3:00       0

[REPORT]
;;Reporting Options
INPUT      YES
CONTROLS   NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]

[MAP]
DIMENSIONS       2308.3358        5625.5473        2799.8642        5892.9067
UNITS            Meters

[COORDINATES]
;;Node            X-Coord          Y-Coord
;;--------------- ---------------- ----------------
OF1              2340.678         5741.56

[VERTICES]
;;Link            X-Coord          Y-Coord
;;--------------- ---------------- ----------------

[POLYGONS]
;;Subcatchment    X-Coord          Y-Coord
;;--------------- ---------------- ----------------
A1               2777.522         5658.968
A1               2659.479         5653.782
A1               2659.479         5653.782
A1               2655.483         5653.606
A1               2655.483         5653.606
A1               2437.145         5644.012
A1               2437.145         5644.012
A1               2433.563         5643.537
A1               2433.563         5643.537
A1               2409.205         5638.133
A1               2409.205         5638.133
A1               2407.252         5637.7
A1               2407.252         5637.7
A1               2406.819         5639.652
A1               2406.819         5639.652
A1               2401.528         5663.497
A1               2401.528         5663.497
A1               2395.896         5688.88
A1               2395.896         5688.88
A1               2370.159         5804.874
A1               2370.159         5804.874
A1               2364.527         5830.257
A1               2364.527         5830.257
A1               2363.161         5836.414
A1               2363.161         5836.414
A1               2362.308         5840.323
A1               2362.308         5840.323
A1               2361.655         5843.695
A1               2360.197         5853.895
A1               2360.017         5855.889
A1               2360.017         5855.889
A1               2399.07          5864.554
```

```
A1               2399.07          5864.554
A1               2595.367         5873.179
A1               2595.367         5873.179
A1               2599.363         5873.354
A1               2599.363         5873.354
A1               2767.776         5880.754
A1               2767.776         5880.754
A1               2777.522         5658.968

[SYMBOLS]
;;Gage            X-Coord          Y-Coord
;;--------------- ---------------- ----------------
```

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

DEL13-124P4 - Allowable Conditions


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 1
Number of nodes ........... 1
Number of links ........... 0
Number of pollutants ...... 0
Number of land uses ....... 0


***************
Raingage Summary
***************
                                                Data       Recording
Name                 Data Source                Type       Interval
------------------------------------------------------------------
Norfolk              Norfolk-2yr                INTENSITY    5 min.


*******************
Subcatchment Summary
*******************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
-------------------------------------------------------------------------------------------
A1                          8.68    218.59     36.00    0.2500 Norfolk              OF1


************
Node Summary
************
                                      Invert      Max.    Ponded    External
Name                 Type               Elev.     Depth      Area    Inflow
-------------------------------------------------------------------------
OF1                  OUTFALL            0.00      0.00       0.0


*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

***************
Analysis Options
***************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... NO
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Starting Date ............ 04/10/2015 00:00:00
Ending Date .............. 04/12/2015 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
```

DEL13-124P4 – Dover Coast Subdivision Phase 4
2-Year Design Storm Event – Allowable Conditions PCSWMM Output

```
*************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
*************************     ---------       -------
Total Precipitation ......         0.283        32.583
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.165        18.997
Surface Runoff ...........         0.106        12.237
Final Storage ............         0.012         1.352
Continuity Error (%) .....        -0.008


*************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
*************************     ---------      ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.106         1.062
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         0.106         1.062
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....         0.000


***************************
Subcatchment Runoff Summary
***************************

-----------------------------------------------------------------------------------------------------------------------------
                          Total      Total      Total      Total      Total      Total      Peak    Runoff
                         Precip      Runon       Evap      Infil     Runoff     Runoff     Runoff    Coeff
Subcatchment                 mm         mm         mm         mm         mm   10^6 ltr        LPS
-----------------------------------------------------------------------------------------------------------------------------
A1                        32.58       0.00       0.00      19.00      12.24       1.06     466.61    0.376


Analysis begun on:  Thu Jul 17 09:53:48 2025
Analysis ended on:  Thu Jul 17 09:53:48 2025
Total elapsed time: < 1 sec
```

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

DEL13-124P4 - Allowable Conditions


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 1
Number of nodes ........... 1
Number of links ........... 0
Number of pollutants ...... 0
Number of land uses ....... 0


***************
Raingage Summary
***************
                                            Data       Recording
Name                Data Source             Type       Interval
------------------------------------------------------------------
Norfolk             Norfolk-5yr             INTENSITY    5 min.


*******************
Subcatchment Summary
*******************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
------------------------------------------------------------------------------------------
A1                          8.68    218.59     36.00    0.2500 Norfolk              OF1


************
Node Summary
************
                                      Invert      Max.    Ponded    External
Name                Type               Elev.     Depth      Area    Inflow
------------------------------------------------------------------------
OF1                 OUTFALL             0.00      0.00       0.0


*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

***************
Analysis Options
***************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... NO
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Starting Date ............ 04/10/2015 00:00:00
Ending Date .............. 04/12/2015 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
```

DEL13-124P4 – Dover Coast Subdivision Phase 4
5-Year Design Storm Event – Allowable Conditions PCSWMM Output

```
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         0.390        44.904
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.208        23.997
Surface Runoff ...........         0.170        19.567
Final Storage ............         0.012         1.345
Continuity Error (%) .....        -0.009


**************************        Volume         Volume
Flow Routing Continuity        hectare-m       10^6 ltr
**************************     ---------       ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.170         1.698
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         0.170         1.698
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....         0.000


***************************
Subcatchment Runoff Summary
***************************

-----------------------------------------------------------------------------------------------------------------------
                         Total      Total      Total      Total      Total      Total      Peak    Runoff
                        Precip      Runon       Evap      Infil     Runoff     Runoff     Runoff    Coeff
Subcatchment                mm         mm         mm         mm         mm   10^6 ltr        LPS
-----------------------------------------------------------------------------------------------------------------------
A1                       44.90       0.00       0.00      24.00      19.57       1.70     698.24    0.436


Analysis begun on:  Thu Jul 17 10:02:37 2025
Analysis ended on:  Thu Jul 17 10:02:37 2025
Total elapsed time: < 1 sec
```

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

DEL13-124P4 - Allowable Conditions


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 1
Number of nodes ........... 1
Number of links ........... 0
Number of pollutants ...... 0
Number of land uses ....... 0


***************
Raingage Summary
***************
                                                Data       Recording
Name                 Data Source                Type       Interval
----------------------------------------------------------------------
Norfolk              Norfolk-10yr               INTENSITY    5 min.


*******************
Subcatchment Summary
*******************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
-------------------------------------------------------------------------------------------------
A1                          8.68    218.59     36.00    0.2500 Norfolk              OF1


************
Node Summary
************
                                      Invert      Max.    Ponded    External
Name                 Type              Elev.     Depth      Area    Inflow
-----------------------------------------------------------------------------
OF1                  OUTFALL            0.00      0.00       0.0


*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

***************
Analysis Options
***************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... NO
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Starting Date ............ 04/10/2015 00:00:00
Ending Date .............. 04/12/2015 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
```

DEL13-124P4 – Dover Coast Subdivision Phase 4
10-Year Design Storm Event – Allowable Conditions PCSWMM Output

```
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         0.460        52.991
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.229        26.445
Surface Runoff ...........         0.219        25.202
Final Storage ............         0.012         1.349
Continuity Error (%) .....        -0.010


**************************        Volume         Volume
Flow Routing Continuity        hectare-m       10^6 ltr
**************************     ---------       ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.219         2.187
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         0.219         2.187
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....         0.000


***************************
Subcatchment Runoff Summary
***************************

-------------------------------------------------------------------------------------------------------------------------------
                         Total      Total      Total      Total      Total      Total      Peak    Runoff
                        Precip      Runon       Evap      Infil     Runoff     Runoff     Runoff    Coeff
Subcatchment                mm         mm         mm         mm         mm   10^6 ltr        LPS
-------------------------------------------------------------------------------------------------------------------------------
A1                       52.99       0.00       0.00      26.44      25.20       2.19     854.79    0.476


Analysis begun on:  Thu Jul 17 10:04:56 2025
Analysis ended on:  Thu Jul 17 10:04:56 2025
Total elapsed time: < 1 sec
```

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

DEL13-124P4 - Allowable Conditions


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 1
Number of nodes ........... 1
Number of links ........... 0
Number of pollutants ...... 0
Number of land uses ....... 0


***************
Raingage Summary
***************
                                                Data       Recording
Name                 Data Source                Type       Interval
----------------------------------------------------------------------
Norfolk              Norfolk-25yr               INTENSITY    5 min.


*******************
Subcatchment Summary
*******************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
-------------------------------------------------------------------------------------------------
A1                          8.68    218.59     36.00    0.2500 Norfolk              OF1


************
Node Summary
************
                                      Invert      Max.    Ponded    External
Name                 Type              Elev.     Depth      Area    Inflow
-----------------------------------------------------------------------------
OF1                  OUTFALL            0.00      0.00       0.0


*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

***************
Analysis Options
***************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... NO
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Starting Date ............ 04/10/2015 00:00:00
Ending Date .............. 04/12/2015 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
```

DEL13-124P4 – Dover Coast Subdivision Phase 4
25-Year Design Storm Event – Allowable Conditions PCSWMM Output

```
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         0.548        63.151
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.252        28.996
Surface Runoff ...........         0.285        32.819
Final Storage ............         0.012         1.342
Continuity Error (%) .....        -0.011


**************************        Volume         Volume
Flow Routing Continuity        hectare-m       10^6 ltr
**************************     ---------       ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.285         2.848
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         0.285         2.848
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....         0.000


***************************
Subcatchment Runoff Summary
***************************

-------------------------------------------------------------------------------------------------------------------------------
                         Total      Total      Total      Total      Total      Total      Peak    Runoff
                        Precip      Runon       Evap      Infil     Runoff     Runoff     Runoff    Coeff
Subcatchment                mm         mm         mm         mm         mm   10^6 ltr        LPS
-------------------------------------------------------------------------------------------------------------------------------
A1                       63.15       0.00       0.00      29.00      32.82       2.85    1071.29    0.520


Analysis begun on:  Thu Jul 17 10:07:26 2025
Analysis ended on:  Thu Jul 17 10:07:26 2025
Total elapsed time: < 1 sec
```

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

DEL13-124P4 - Allowable Conditions


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 1
Number of nodes ........... 1
Number of links ........... 0
Number of pollutants ...... 0
Number of land uses ....... 0


***************
Raingage Summary
***************
                                                Data       Recording
Name                 Data Source                Type       Interval
----------------------------------------------------------------------
Norfolk              Norfolk-50yr               INTENSITY    5 min.


*******************
Subcatchment Summary
*******************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
-------------------------------------------------------------------------------------------------
A1                          8.68    218.59     36.00    0.2500 Norfolk              OF1


************
Node Summary
************
                                      Invert      Max.    Ponded    External
Name                 Type              Elev.     Depth      Area    Inflow
-----------------------------------------------------------------------------
OF1                  OUTFALL            0.00      0.00       0.0


*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

***************
Analysis Options
***************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... NO
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Starting Date ............ 04/10/2015 00:00:00
Ending Date .............. 04/12/2015 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
```

DEL13-124P4 – Dover Coast Subdivision Phase 4
50-Year Design Storm Event – Allowable Conditions PCSWMM Output

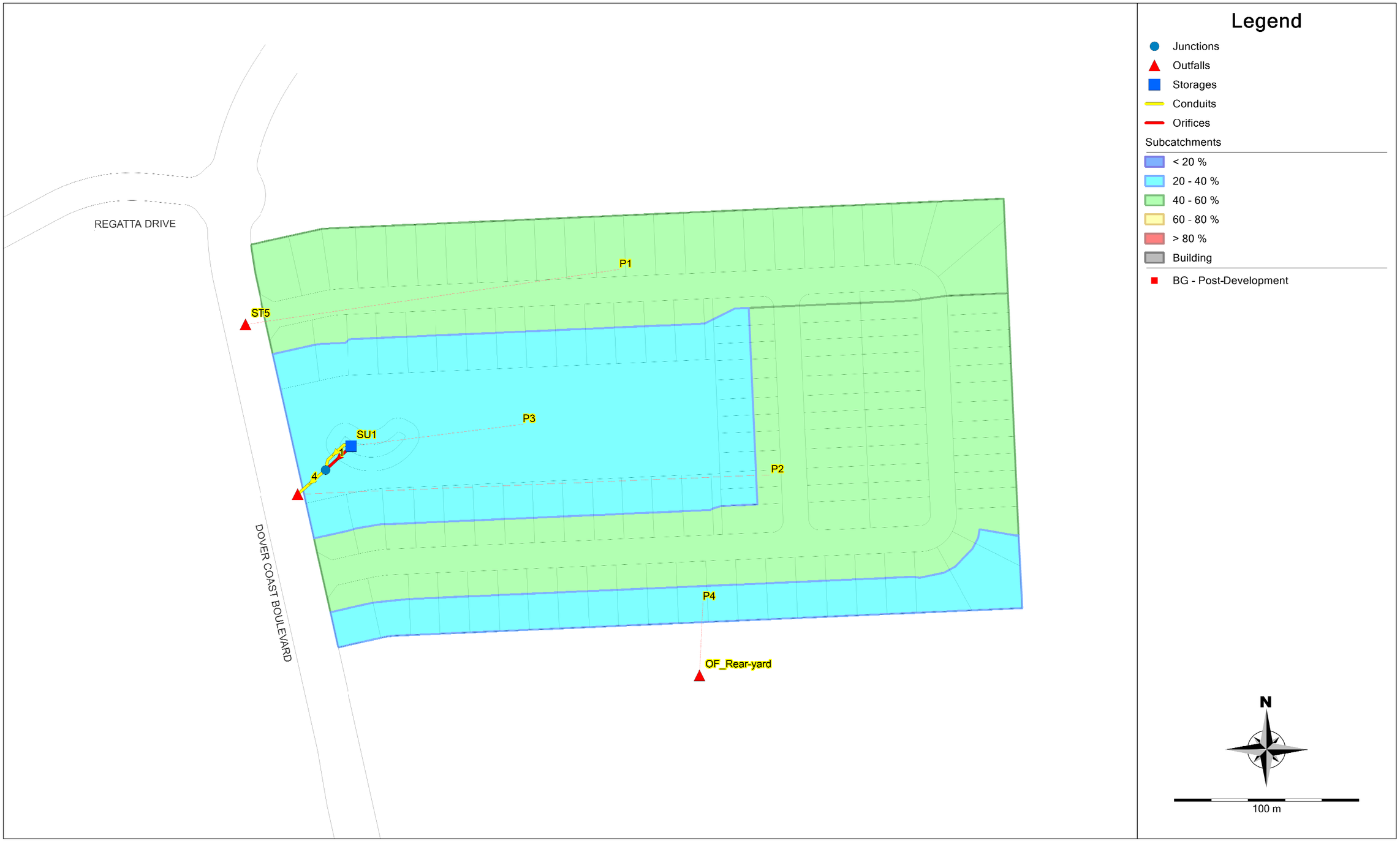
```
*************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
*************************     ---------       -------
Total Precipitation ......         0.617        71.090
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.266        30.609
Surface Runoff ...........         0.340        39.139
Final Storage ............         0.012         1.350
Continuity Error (%) .....        -0.011


*************************        Volume        Volume
Flow Routing Continuity        hectare-m      10^6 ltr
*************************     ---------      ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.340         3.397
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         0.340         3.397
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....         0.000


***************************
Subcatchment Runoff Summary
***************************

-----------------------------------------------------------------------------------------------------------------------------
                         Total      Total      Total      Total      Total      Total      Peak    Runoff
                        Precip      Runon       Evap      Infil     Runoff     Runoff     Runoff    Coeff
Subcatchment                mm         mm         mm         mm         mm   10^6 ltr        LPS
-----------------------------------------------------------------------------------------------------------------------------
A1                       71.09       0.00       0.00      30.61      39.14       3.40    1240.88    0.551


Analysis begun on:  Thu Jul 17 10:35:21 2025
Analysis ended on:  Thu Jul 17 10:35:21 2025
Total elapsed time: < 1 sec
```

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.012)
--------------------------------------------------------------

DEL13-124P4 - Allowable Conditions


*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 1
Number of nodes ........... 1
Number of links ........... 0
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                            Data       Recording
Name                 Data Source            Type       Interval
----------------------------------------------------------------
Norfolk              Norfolk-100yr          INTENSITY    5 min.


********************
Subcatchment Summary
********************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
-------------------------------------------------------------------------------------------
A1                          8.68    218.59     36.00    0.2500 Norfolk              OF1


************
Node Summary
************
                                    Invert      Max.    Ponded    External
Name                 Type            Elev.     Depth      Area    Inflow
----------------------------------------------------------------------
OF1                  OUTFALL          0.00      0.00       0.0


*********************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*********************************************************

****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... NO
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Starting Date ............ 04/10/2015 00:00:00
Ending Date .............. 04/12/2015 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
```

DEL13-124P4 – Dover Coast Subdivision Phase 4
100-Year Design Storm Event – Allowable Conditions PCSWMM Output

```
**************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
**************************     ---------       -------
Total Precipitation ......         0.684        78.830
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.277        31.964
Surface Runoff ...........         0.395        45.527
Final Storage ............         0.012         1.348
Continuity Error (%) .....        -0.012


**************************        Volume         Volume
Flow Routing Continuity        hectare-m       10^6 ltr
**************************     ---------       ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.395         3.951
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         0.395         3.951
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....         0.000


***************************
Subcatchment Runoff Summary
***************************

-----------------------------------------------------------------------------------------------------------------------------
                         Total      Total      Total      Total      Total      Total      Peak    Runoff
                        Precip      Runon       Evap      Infil     Runoff     Runoff     Runoff    Coeff
Subcatchment                mm         mm         mm         mm         mm   10^6 ltr        LPS
-----------------------------------------------------------------------------------------------------------------------------
A1                       78.83       0.00       0.00      31.96      45.53       3.95    1415.17    0.578


Analysis begun on:  Thu Jul 17 10:37:46 2025
Analysis ended on:  Thu Jul 17 10:37:46 2025
Total elapsed time: < 1 sec
```

Appendix D: Post-Development Modeling


REGATTA DRIVE
DOVER COAST BOULEVARD
P1
P2
P3
P4
ST5
SU1
1
4
OF_Rear-yard
Legend
Junctions
Outfalls
Storages
Conduits
Orifices
Subcatchments
< 20 %
20 - 40 %
40 - 60 %
60 - 80 %
> 80 %
Building
BG - Post-Development
N
100 m

```
[TITLE]
;;Project Title/Notes
DEL13-124P4 - Post-Development

[OPTIONS]
;;Option             Value
FLOW_UNITS           LPS
INFILTRATION         CURVE_NUMBER
FLOW_ROUTING         DYNWAVE
LINK_OFFSETS         ELEVATION
MIN_SLOPE            0
ALLOW_PONDING        YES
SKIP_STEADY_STATE    NO

START_DATE           04/10/2015
START_TIME           00:00:00
REPORT_START_DATE    04/10/2015
REPORT_START_TIME    00:00:00
END_DATE             04/12/2015
END_TIME             00:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          00:01:00
WET_STEP             00:01:00
DRY_STEP             00:01:00
ROUTING_STEP         1
RULE_STEP            00:00:00

INERTIAL_DAMPING     PARTIAL
NORMAL_FLOW_LIMITED  BOTH
FORCE_MAIN_EQUATION  H-W
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         0
MAX_TRIALS           8
HEAD_TOLERANCE       0.0015
SYS_FLOW_TOL         5
LAT_FLOW_TOL         5
MINIMUM_STEP         0.5
THREADS              2

[EVAPORATION]
;;Data Source    Parameters
;;--------------- ----------
CONSTANT         0.0
DRY_ONLY         NO

[RAINGAGES]
;;Name           Format    Interval SCF      Source
;;-------------- --------- -------- -------- ----------
Norfolk          INTENSITY 0:05     1.0      TIMESERIES Norfolk-25yr

[SUBCATCHMENTS]
;;Name           Rain Gage        Outlet           Area     %Imperv  Width    %Slope   CurbLen  SnowPack
;;-------------- ---------------- ---------------- -------- -------- -------- -------- -------- -------------
---
P1               Norfolk          ST5              2.326    50       66.457   0.5      0
P2               Norfolk          ST3_Low          3.024    59       71.153   0.5      0
P3               Norfolk          SU1              2.537    23       169.133  2        0
P4               Norfolk          OF_Rear-yard     0.791    28       316.4    2        0

[SUBAREAS]
;;Subcatchment   N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;;-------------- ---------- ---------- ---------- ---------- ---------- ---------- ----------
P1               0.012      0.24       2          5          25         OUTLET
P2               0.012      0.24       2          5          25         OUTLET
P3               0.012      0.24       2          5          25         OUTLET
P4               0.012      0.24       2          5          25         OUTLET
```

DEL13-124P4 – Dover Coast Subdivision Phase 4
Post-Development PCSWMM Input

```
[INFILTRATION]
;;Subcatchment   Param1     Param2     Param3     Param4     Param5
;;-------------- ---------- ---------- ---------- ---------- ----------
P1               82         12.7       7          0          0
P2               82         12.7       7          0          0
P3               82         12.7       7          0          0
P4               82         12.7       7          0          0

[JUNCTIONS]
;;Name           Elevation  MaxDepth   InitDepth  SurDepth   Aponded
;;-------------- ---------- ---------- ---------- ---------- ----------
J1               188.6      1.51       0          0          0

[OUTFALLS]
;;Name           Elevation  Type       Stage Data       Gated    Route To
;;-------------- ---------- ---------- ---------------- -------- ----------------
OF_Rear-yard     0          FREE                        NO
ST3_Low          187        FREE                        NO
ST5              0          FREE                        NO

[STORAGE]
;;Name           Elev.    MaxDepth   InitDepth  Shape      Curve Name/Params            SurDepth Fevap
Psi      Ksat     IMD
;;-------------- -------- ---------- ---------- ---------- ---------------------------- -------- -------- --
------ -------- --------
SU1              188.77   1.82       0          TABULAR    Dry_Basin                    0        0

[CONDUITS]
;;Name           From Node        To Node          Length     Roughness  InOffset   OutOffset  InitFlow
MaxFlow
;;-------------- ---------------- ---------------- ---------- ---------- ---------- ---------- ---------- ---
-------
2                SU1              J1               1          0.013      189.37     189.28     0          0
4                J1               ST3_Low          30.6       0.013      188.61     188.52     0          0

[ORIFICES]
;;Name           From Node        To Node          Type         Offset     Qcoeff     Gated    CloseTime
;;-------------- ---------------- ---------------- ------------ ---------- ---------- -------- ----------
1                SU1              J1               SIDE         188.77     0.65       NO       0

[XSECTIONS]
;;Link           Shape        Geom1            Geom2      Geom3      Geom4      Barrels    Culvert
;;-------------- ------------ ---------------- ---------- ---------- ---------- ---------- ----------
2                CIRCULAR     0.375            0          0          0          1
4                CIRCULAR     0.375            0          0          0          1
1                CIRCULAR     0.2              0          0          0

[LOSSES]
;;Link           Kentry     Kexit      Kavg       Flap Gate  Seepage
;;-------------- ---------- ---------- ---------- ---------- ----------

[CURVES]
;;Name           Type       X-Value    Y-Value
;;-------------- ---------- ---------- ----------
Dry_Basin        Storage    0          0
Dry_Basin                   0.1        118
Dry_Basin                   0.2        259
Dry_Basin                   0.3        297
Dry_Basin                   0.4        336
Dry_Basin                   0.5        376
Dry_Basin                   0.6        418
Dry_Basin                   0.7        460
Dry_Basin                   0.8        504
Dry_Basin                   0.9        549
Dry_Basin                   1          595
Dry_Basin                   1.1        642
Dry_Basin                   1.2        691
Dry_Basin                   1.3        741
```

```
Dry_Basin                1.4        791
Dry_Basin                1.5        843
Dry_Basin                1.6        897
Dry_Basin                1.7        951
Dry_Basin                1.8        1007
Dry_Basin                1.82       1018

[TIMESERIES]
;;Name           Date       Time       Value
;;-------------- ---------- ---------- ----------
Hurricane_Hazel_48           0          2.0278
Hurricane_Hazel_48           1          2.0278
Hurricane_Hazel_48           2          2.0278
Hurricane_Hazel_48           3          2.0278
Hurricane_Hazel_48           4          2.0278
Hurricane_Hazel_48           5          2.0278
Hurricane_Hazel_48           6          2.0278
Hurricane_Hazel_48           7          2.0278
Hurricane_Hazel_48           8          2.0278
Hurricane_Hazel_48           9          2.0278
Hurricane_Hazel_48           10         2.0278
Hurricane_Hazel_48           11         2.0278
Hurricane_Hazel_48           12         2.0278
Hurricane_Hazel_48           13         2.0278
Hurricane_Hazel_48           14         2.0278
Hurricane_Hazel_48           15         2.0278
Hurricane_Hazel_48           16         2.0278
Hurricane_Hazel_48           17         2.0278
Hurricane_Hazel_48           18         2.0278
Hurricane_Hazel_48           19         2.0278
Hurricane_Hazel_48           20         2.0278
Hurricane_Hazel_48           21         2.0278
Hurricane_Hazel_48           22         2.0278
Hurricane_Hazel_48           23         2.0278
Hurricane_Hazel_48           24         2.0278
Hurricane_Hazel_48           25         2.0278
Hurricane_Hazel_48           26         2.0278
Hurricane_Hazel_48           27         2.0278
Hurricane_Hazel_48           28         2.0278
Hurricane_Hazel_48           29         2.0278
Hurricane_Hazel_48           30         2.0278
Hurricane_Hazel_48           31         2.0278
Hurricane_Hazel_48           32         2.0278
Hurricane_Hazel_48           33         2.0278
Hurricane_Hazel_48           34         2.0278
Hurricane_Hazel_48           35         2.0278
Hurricane_Hazel_48           36         6
Hurricane_Hazel_48           37         4
Hurricane_Hazel_48           38         6
Hurricane_Hazel_48           39         13
Hurricane_Hazel_48           40         17
Hurricane_Hazel_48           41         13
Hurricane_Hazel_48           42         23
Hurricane_Hazel_48           43         13
Hurricane_Hazel_48           44         13
Hurricane_Hazel_48           45         53
Hurricane_Hazel_48           46         38
Hurricane_Hazel_48           47         13
Hurricane_Hazel_48           48         0

Norfolk-100yr            0:00       9.376
Norfolk-100yr            0:05       9.856
Norfolk-100yr            0:10       10.403
Norfolk-100yr            0:15       11.033
Norfolk-100yr            0:20       11.77
Norfolk-100yr            0:25       12.645
Norfolk-100yr            0:30       13.704
Norfolk-100yr            0:35       15.02
Norfolk-100yr            0:40       16.71
```

DEL13-124P4 – Dover Coast Subdivision Phase 4
Post-Development PCSWMM Input

```
Norfolk-100yr            0:45       18.978
Norfolk-100yr            0:50       22.227
Norfolk-100yr            0:55       27.381
Norfolk-100yr            1:00       37.24
Norfolk-100yr            1:05       68.375
Norfolk-100yr            1:10       234.168
Norfolk-100yr            1:15       77.397
Norfolk-100yr            1:20       46.283
Norfolk-100yr            1:25       34.742
Norfolk-100yr            1:30       28.451
Norfolk-100yr            1:35       24.408
Norfolk-100yr            1:40       21.553
Norfolk-100yr            1:45       19.412
Norfolk-100yr            1:50       17.737
Norfolk-100yr            1:55       16.383
Norfolk-100yr            2:00       15.263
Norfolk-100yr            2:05       14.317
Norfolk-100yr            2:10       13.506
Norfolk-100yr            2:15       12.802
Norfolk-100yr            2:20       12.184
Norfolk-100yr            2:25       11.636
Norfolk-100yr            2:30       11.145
Norfolk-100yr            2:35       10.704
Norfolk-100yr            2:40       10.305
Norfolk-100yr            2:45       9.941
Norfolk-100yr            2:50       9.607
Norfolk-100yr            2:55       9.301
Norfolk-100yr            3:00       0

Norfolk-10yr             0:00       5.682
Norfolk-10yr             0:05       5.998
Norfolk-10yr             0:10       6.36
Norfolk-10yr             0:15       6.78
Norfolk-10yr             0:20       7.275
Norfolk-10yr             0:25       7.867
Norfolk-10yr             0:30       8.592
Norfolk-10yr             0:35       9.502
Norfolk-10yr             0:40       10.686
Norfolk-10yr             0:45       12.303
Norfolk-10yr             0:50       14.667
Norfolk-10yr             0:55       18.522
Norfolk-10yr             1:00       26.175
Norfolk-10yr             1:05       51.182
Norfolk-10yr             1:10       156.914
Norfolk-10yr             1:15       58.449
Norfolk-10yr             1:20       33.388
Norfolk-10yr             1:25       24.199
Norfolk-10yr             1:30       19.332
Norfolk-10yr             1:35       16.281
Norfolk-10yr             1:40       14.171
Norfolk-10yr             1:45       12.615
Norfolk-10yr             1:50       11.414
Norfolk-10yr             1:55       10.456
Norfolk-10yr             2:00       9.671
Norfolk-10yr             2:05       9.014
Norfolk-10yr             2:10       8.456
Norfolk-10yr             2:15       7.975
Norfolk-10yr             2:20       7.555
Norfolk-10yr             2:25       7.184
Norfolk-10yr             2:30       6.855
Norfolk-10yr             2:35       6.561
Norfolk-10yr             2:40       6.295
Norfolk-10yr             2:45       6.054
Norfolk-10yr             2:50       5.834
Norfolk-10yr             2:55       5.632
Norfolk-10yr             3:00       0

Norfolk-25yr             0:00       7.108
Norfolk-25yr             0:05       7.488
```

Norfolk-25yr	0:10	7.923
Norfolk-25yr	0:15	8.425
Norfolk-25yr	0:20	9.015
Norfolk-25yr	0:25	9.717
Norfolk-25yr	0:30	10.573
Norfolk-25yr	0:35	11.642
Norfolk-25yr	0:40	13.024
Norfolk-25yr	0:45	14.896
Norfolk-25yr	0:50	17.606
Norfolk-25yr	0:55	21.969
Norfolk-25yr	1:00	30.493
Norfolk-25yr	1:05	58.078
Norfolk-25yr	1:10	187.916
Norfolk-25yr	1:15	66.106
Norfolk-25yr	1:20	38.442
Norfolk-25yr	1:25	28.309
Norfolk-25yr	1:30	22.881
Norfolk-25yr	1:35	19.441
Norfolk-25yr	1:40	17.04
Norfolk-25yr	1:45	15.255
Norfolk-25yr	1:50	13.869
Norfolk-25yr	1:55	12.756
Norfolk-25yr	2:00	11.84
Norfolk-25yr	2:05	11.07
Norfolk-25yr	2:10	10.413
Norfolk-25yr	2:15	9.844
Norfolk-25yr	2:20	9.347
Norfolk-25yr	2:25	8.907
Norfolk-25yr	2:30	8.515
Norfolk-25yr	2:35	8.163
Norfolk-25yr	2:40	7.845
Norfolk-25yr	2:45	7.555
Norfolk-25yr	2:50	7.291
Norfolk-25yr	2:55	7.049
Norfolk-25yr	3:00	0
Norfolk-2yr	0:00	3.052
Norfolk-2yr	0:05	3.239
Norfolk-2yr	0:10	3.455
Norfolk-2yr	0:15	3.707
Norfolk-2yr	0:20	4.006
Norfolk-2yr	0:25	4.369
Norfolk-2yr	0:30	4.817
Norfolk-2yr	0:35	5.387
Norfolk-2yr	0:40	6.141
Norfolk-2yr	0:45	7.189
Norfolk-2yr	0:50	8.756
Norfolk-2yr	0:55	11.381
Norfolk-2yr	1:00	16.761
Norfolk-2yr	1:05	34.542
Norfolk-2yr	1:10	98.992
Norfolk-2yr	1:15	39.682
Norfolk-2yr	1:20	21.921
Norfolk-2yr	1:25	15.353
Norfolk-2yr	1:30	11.939
Norfolk-2yr	1:35	9.844
Norfolk-2yr	1:40	8.423
Norfolk-2yr	1:45	7.392
Norfolk-2yr	1:50	6.609
Norfolk-2yr	1:55	5.993
Norfolk-2yr	2:00	5.493
Norfolk-2yr	2:05	5.08
Norfolk-2yr	2:10	4.732
Norfolk-2yr	2:15	4.434
Norfolk-2yr	2:20	4.177
Norfolk-2yr	2:25	3.951
Norfolk-2yr	2:30	3.752
Norfolk-2yr	2:35	3.575
Norfolk-2yr	2:40	3.416

DEL13-124P4 – Dover Coast Subdivision Phase 4
Post-Development PCSWMM Input

Norfolk-2yr	2:45	3.272
Norfolk-2yr	2:50	3.142
Norfolk-2yr	2:55	3.023
Norfolk-2yr	3:00	0
Norfolk-50yr	0:00	8.23
Norfolk-50yr	0:05	8.661
Norfolk-50yr	0:10	9.152
Norfolk-50yr	0:15	9.72
Norfolk-50yr	0:20	10.384
Norfolk-50yr	0:25	11.175
Norfolk-50yr	0:30	12.135
Norfolk-50yr	0:35	13.331
Norfolk-50yr	0:40	14.872
Norfolk-50yr	0:45	16.95
Norfolk-50yr	0:50	19.944
Norfolk-50yr	0:55	24.728
Norfolk-50yr	1:00	33.984
Norfolk-50yr	1:05	63.622
Norfolk-50yr	1:10	210.855
Norfolk-50yr	1:15	72.235
Norfolk-50yr	1:20	42.55
Norfolk-50yr	1:25	31.625
Norfolk-50yr	1:30	25.725
Norfolk-50yr	1:35	21.962
Norfolk-50yr	1:40	19.321
Norfolk-50yr	1:45	17.349
Norfolk-50yr	1:50	15.811
Norfolk-50yr	1:55	14.573
Norfolk-50yr	2:00	13.552
Norfolk-50yr	2:05	12.691
Norfolk-50yr	2:10	11.956
Norfolk-50yr	2:15	11.317
Norfolk-50yr	2:20	10.758
Norfolk-50yr	2:25	10.263
Norfolk-50yr	2:30	9.821
Norfolk-50yr	2:35	9.423
Norfolk-50yr	2:40	9.064
Norfolk-50yr	2:45	8.737
Norfolk-50yr	2:50	8.437
Norfolk-50yr	2:55	8.163
Norfolk-50yr	3:00	0
Norfolk-5yr	0:00	4.74
Norfolk-5yr	0:05	5.006
Norfolk-5yr	0:10	5.311
Norfolk-5yr	0:15	5.665
Norfolk-5yr	0:20	6.082
Norfolk-5yr	0:25	6.581
Norfolk-5yr	0:30	7.192
Norfolk-5yr	0:35	7.961
Norfolk-5yr	0:40	8.962
Norfolk-5yr	0:45	10.331
Norfolk-5yr	0:50	12.336
Norfolk-5yr	0:55	15.613
Norfolk-5yr	1:00	22.139
Norfolk-5yr	1:05	43.595
Norfolk-5yr	1:10	135.065
Norfolk-5yr	1:15	49.843
Norfolk-5yr	1:20	28.308
Norfolk-5yr	1:25	20.451
Norfolk-5yr	1:30	16.302
Norfolk-5yr	1:35	13.707
Norfolk-5yr	1:40	11.915
Norfolk-5yr	1:45	10.595
Norfolk-5yr	1:50	9.578
Norfolk-5yr	1:55	8.767
Norfolk-5yr	2:00	8.104
Norfolk-5yr	2:05	7.549

```
Norfolk-5yr               2:10       7.078
Norfolk-5yr               2:15       6.671
Norfolk-5yr               2:20       6.317
Norfolk-5yr               2:25       6.005
Norfolk-5yr               2:30       5.728
Norfolk-5yr               2:35       5.48
Norfolk-5yr               2:40       5.256
Norfolk-5yr               2:45       5.053
Norfolk-5yr               2:50       4.868
Norfolk-5yr               2:55       4.698
Norfolk-5yr               3:00       0

[REPORT]
;;Reporting Options
INPUT      YES
CONTROLS   NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]

[MAP]
DIMENSIONS       2335.96045       5609.602         2798.89655       5893.666
UNITS            Meters

[COORDINATES]
;;Node            X-Coord            Y-Coord
;;--------------- ------------------ ------------------
J1                2395.767           5700.829
OF_Rear-yard      2603.078           5622.514
ST3_Low           2383.096           5691.132
ST5               2357.003           5812.676
SU1               2412.353           5714.612

[VERTICES]
;;Link            X-Coord            Y-Coord
;;--------------- ------------------ ------------------
2                 2405.192           5715.922
2                 2395.773           5708.063

[POLYGONS]
;;Subcatchment    X-Coord            Y-Coord
;;--------------- ------------------ ------------------
P1                2360.017           5855.889
P1                2399.07            5864.554
P1                2767.776           5880.754
P1                2770.025           5829.577
P1                2736.978           5828.125
P1                2717.154           5825.479
P1                2702.169           5824.82
P1                2678.192           5823.767
P1                2663.206           5823.108
P1                2637.231           5821.967
P1                2622.246           5821.309
P1                2605.783           5813.078
P1                2604.584           5813.025
P1                2590.847           5812.422
P1                2588.449           5812.316
P1                2574.713           5811.713
P1                2572.315           5811.608
P1                2558.578           5811.004
P1                2556.18            5810.899
P1                2542.444           5810.295
P1                2540.046           5810.19
P1                2526.309           5809.586
P1                2523.912           5809.481
P1                2510.175           5808.877
P1                2507.777           5808.772
```

DEL13-124P4 – Dover Coast Subdivision Phase 4
Post-Development PCSWMM Input

```
P1                2494.04            5808.168
P1                2491.643           5808.063
P1                2477.906           5807.459
P1                2475.508           5807.354
P1                2461.772           5806.75
P1                2459.374           5806.645
P1                2445.637           5806.041
P1                2443.239           5805.936
P1                2429.503           5805.332
P1                2427.105           5805.227
P1                2413.368           5804.623
P1                2411.052           5802.663
P1                2396.502           5802.024
P1                2392.86            5801.204
P1                2377.86            5797.876
P1                2372.001           5796.576
P1                2370.16            5804.874
P1                2364.527           5830.257
P1                2363.161           5836.414
P1                2362.308           5840.323
P1                2360.197           5853.895
P1                2360.017           5855.889
P2                2394.148           5696.763
P2                2400.005           5698.063
P2                2414.599           5701.301
P2                2417.26            5702.146
P2                2430.644           5704.411
P2                2433.936           5704.43
P2                2447.673           5705.033
P2                2450.071           5705.139
P2                2463.807           5705.742
P2                2466.205           5705.846
P2                2479.942           5706.45
P2                2482.34            5706.557
P2                2496.076           5707.16
P2                2498.474           5707.266
P2                2512.211           5707.869
P2                2514.608           5707.974
P2                2528.345           5708.578
P2                2530.743           5708.683
P2                2544.48            5709.287
P2                2546.877           5709.392
P2                2560.614           5709.996
P2                2563.012           5710.101
P2                2576.749           5710.705
P2                2579.146           5710.81
P2                2592.883           5711.414
P2                2595.281           5711.519
P2                2609.017           5712.123
P2                2610.183           5712.925
P2                2614.937           5714.285
P2                2626.925           5714.812
P2                2634.418           5715.141
P2                2629.738           5821.638
P2                2637.231           5821.967
P2                2663.206           5823.108
P2                2678.192           5823.767
P2                2702.169           5824.82
P2                2717.154           5825.479
P2                2736.978           5828.125
P2                2770.025           5829.577
P2                2775.793           5698.313
P2                2774.29            5698.336
P2                2762.267           5700.39
P2                2754.874           5701.653
P2                2754.109           5697.174
P2                2750.976           5691.093
P2                2741.601           5681.431
P2                2735.642           5678.179
```

P2	2722.436	5675.41
P2	2718.795	5675.907
P2	2705.058	5675.303
P2	2702.661	5675.198
P2	2688.924	5674.594
P2	2686.526	5674.489
P2	2672.789	5673.885
P2	2670.392	5673.78
P2	2656.655	5673.176
P2	2654.257	5673.071
P2	2640.521	5672.467
P2	2638.123	5672.362
P2	2624.386	5671.758
P2	2621.988	5671.653
P2	2608.252	5671.05
P2	2605.854	5670.944
P2	2592.117	5670.341
P2	2589.72	5670.235
P2	2575.983	5669.632
P2	2573.585	5669.526
P2	2559.848	5668.923
P2	2557.451	5668.817
P2	2543.714	5668.214
P2	2541.316	5668.108
P2	2527.58	5667.505
P2	2525.182	5667.399
P2	2511.445	5666.796
P2	2509.047	5666.691
P2	2495.311	5666.087
P2	2492.913	5665.982
P2	2479.176	5665.378
P2	2476.779	5665.273
P2	2463.042	5664.669
P2	2460.644	5664.564
P2	2446.907	5663.96
P2	2444.081	5663.799
P2	2428.344	5662.198
P2	2425.124	5661.639
P2	2408.886	5658.036
P2	2403.029	5656.737
P2	2395.897	5688.879
P2	2394.148	5696.763
P3	2400.005	5698.063
P3	2394.148	5696.763
P3	2372.001	5796.576
P3	2377.86	5797.876
P3	2392.86	5801.204
P3	2396.502	5802.024
P3	2411.052	5802.663
P3	2413.368	5804.623
P3	2427.105	5805.227
P3	2429.503	5805.332
P3	2443.239	5805.936
P3	2445.637	5806.041
P3	2459.374	5806.645
P3	2461.772	5806.75
P3	2475.508	5807.354
P3	2477.906	5807.459
P3	2491.643	5808.063
P3	2494.04	5808.168
P3	2507.777	5808.772
P3	2510.175	5808.877
P3	2523.912	5809.481
P3	2526.309	5809.586
P3	2540.046	5810.19
P3	2542.444	5810.295
P3	2556.18	5810.899
P3	2558.578	5811.004
P3	2572.315	5811.608

DEL13-124P4 – Dover Coast Subdivision Phase 4
Post-Development PCSWMM Input

P3	2574.713	5811.713
P3	2588.449	5812.316
P3	2590.847	5812.422
P3	2604.584	5813.025
P3	2605.783	5813.078
P3	2622.246	5821.309
P3	2629.738	5821.638
P3	2634.418	5715.141
P3	2614.937	5714.285
P3	2610.183	5712.925
P3	2609.017	5712.123
P3	2595.281	5711.519
P3	2592.883	5711.414
P3	2579.146	5710.81
P3	2576.749	5710.705
P3	2563.012	5710.101
P3	2560.614	5709.996
P3	2546.877	5709.392
P3	2544.48	5709.287
P3	2530.743	5708.683
P3	2528.345	5708.578
P3	2514.608	5707.974
P3	2512.211	5707.869
P3	2498.474	5707.266
P3	2496.076	5707.16
P3	2482.34	5706.557
P3	2479.942	5706.45
P3	2466.205	5705.846
P3	2463.807	5705.742
P3	2450.071	5705.139
P3	2447.673	5705.033
P3	2433.936	5704.43
P3	2430.644	5704.411
P3	2417.26	5702.146
P3	2414.599	5701.301
P3	2400.005	5698.063
P4	2407.253	5637.699
P4	2433.563	5643.537
P4	2437.145	5644.012
P4	2777.854	5658.983
P4	2775.793	5698.313
P4	2774.29	5698.336
P4	2762.267	5700.39
P4	2754.874	5701.653
P4	2754.109	5697.174
P4	2750.976	5691.093
P4	2741.601	5681.431
P4	2735.642	5678.179
P4	2722.436	5675.41
P4	2718.795	5675.907
P4	2705.058	5675.303
P4	2702.661	5675.198
P4	2688.924	5674.594
P4	2686.526	5674.489
P4	2672.789	5673.885
P4	2670.392	5673.78
P4	2656.655	5673.176
P4	2654.257	5673.071
P4	2640.521	5672.467
P4	2638.123	5672.362
P4	2624.386	5671.758
P4	2621.988	5671.653
P4	2608.252	5671.05
P4	2605.854	5670.944
P4	2592.117	5670.341
P4	2589.72	5670.235
P4	2575.983	5669.632
P4	2573.585	5669.526
P4	2559.848	5668.923

```
P4               2557.451          5668.817
P4               2543.714          5668.214
P4               2541.316          5668.108
P4               2527.58           5667.505
P4               2525.182          5667.399
P4               2511.445          5666.796
P4               2509.047          5666.691
P4               2495.311          5666.087
P4               2492.913          5665.982
P4               2479.176          5665.378
P4               2476.779          5665.273
P4               2463.042          5664.669
P4               2460.644          5664.564
P4               2446.907          5663.96
P4               2444.081          5663.799
P4               2428.344          5662.198
P4               2425.124          5661.639
P4               2408.886          5658.036
P4               2403.029          5656.737
P4               2407.253          5637.699

;;Storage Node   X-Coord           Y-Coord
;;--------------- ----------------- -----------------

[SYMBOLS]
;;Gage           X-Coord           Y-Coord
;;--------------- ----------------- -----------------
```

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)
-------------------------------------------------------------

DEL13-124P4 - Post-Development

*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 4
Number of nodes ........... 5
Number of links ........... 3
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
------------------------------------------------------------------
Norfolk              Norfolk-2yr                 INTENSITY    5 min.


*******************
Subcatchment Summary
*******************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
-----------------------------------------------------------------------------------------------
P1                          2.33     66.46     50.00    0.5000 Norfolk              ST5
P2                          3.02     71.15     59.00    0.5000 Norfolk              ST3_Low
P3                          2.54    169.13     23.00    2.0000 Norfolk              SU1
P4                          0.79    316.40     28.00    2.0000 Norfolk              OF_Rear-yard


************
Node Summary
************
                                    Invert      Max.    Ponded    External
Name                 Type            Elev.     Depth      Area    Inflow
-----------------------------------------------------------------------
J1                   JUNCTION       188.60      1.51       0.0
OF_Rear-yard         OUTFALL          0.00      0.00       0.0
ST3_Low              OUTFALL        187.00      1.90       0.0
ST5                  OUTFALL          0.00      0.00       0.0
SU1                  STORAGE        188.77      1.82       0.0


************
Link Summary
************
Name            From Node        To Node          Type            Length    %Slope Roughness
-----------------------------------------------------------------------------------------------
2               SU1              J1               CONDUIT            1.0    9.0367    0.0130
4               J1               ST3_Low          CONDUIT           30.6    0.2941    0.0130
1               SU1              J1               ORIFICE


*********************
Cross Section Summary
*********************
                                   Full     Full     Hyd.     Max.   No. of     Full
Conduit         Shape             Depth     Area     Rad.    Width  Barrels     Flow
-----------------------------------------------------------------------------------
2               CIRCULAR           0.38     0.11     0.09     0.38        1   527.09
4               CIRCULAR           0.38     0.11     0.09     0.38        1    95.09
```

DEL13-124P4 – Dover Coast Subdivision Phase 4
2-Year Design Storm Event – Post-Development PCSWMM Output

```
***************
Analysis Options
***************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 04/10/2015 00:00:00
Ending Date .............. 04/12/2015 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 1.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 1
Head Tolerance ........... 0.001500 m


*************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
*************************     ---------       -------
Total Precipitation ......         0.283        32.583
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.137        15.733
Surface Runoff ...........         0.134        15.491
Final Storage ............         0.012         1.364
Continuity Error (%) .....        -0.017


*************************        Volume         Volume
Flow Routing Continuity        hectare-m      10^6 ltr
*************************     ---------      ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.134         1.344
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         0.134         1.344
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....         0.000


***************************
Time-Step Critical Elements
***************************
None


*******************************
Highest Flow Instability Indexes
*******************************
All links are stable.
```

```
  *********************************
  Most Frequent Nonconverging Nodes
  *********************************
  Convergence obtained at all time steps.


  ************************
  Routing Time Step Summary
  ************************
  Minimum Time Step           :     0.50 sec
  Average Time Step           :     1.00 sec
  Maximum Time Step           :     1.00 sec
  % of Time in Steady State   :     0.00
  Average Iterations per Step :     2.00
  % of Steps Not Converging   :     0.00
  Time Step Frequencies       :
      1.000 -  0.871 sec      :   100.00 %
      0.871 -  0.758 sec      :     0.00 %
      0.758 -  0.660 sec      :     0.00 %
      0.660 -  0.574 sec      :     0.00 %
      0.574 -  0.500 sec      :     0.00 %


  ***************************
  Subcatchment Runoff Summary
  ***************************

  ---------------------------------------------------------------------------------------------------------------
                                Total      Total      Total      Total     Imperv       Perv      Total
Total     Peak  Runoff
                               Precip      Runon       Evap      Infil    Runoff     Runoff     Runoff
Runoff   Runoff   Coeff
  Subcatchment                    mm         mm         mm         mm         mm         mm         mm    10^6
ltr      LPS
  ---------------------------------------------------------------------------------------------------------------
  P1                           32.58       0.00       0.00      14.38      15.54       1.28      16.83
0.39   186.05   0.516
  P2                           32.58       0.00       0.00      11.79      18.34       1.05      19.39
0.59   238.31   0.595
  P3                           32.58       0.00       0.00      20.91       7.16       3.21      10.37
0.26   157.45   0.318
  P4                           32.58       0.00       0.00      18.19       8.72       4.37      13.08
0.10    60.90   0.401


  ******************
  Node Depth Summary
  ******************

  ------------------------------------------------------------------------
                               Average  Maximum  Maximum  Time of Max    Reported
                                 Depth    Depth      HGL   Occurrence  Max Depth
  Node                 Type      Meters   Meters   Meters  days hr:min      Meters
  ------------------------------------------------------------------------
  J1                   JUNCTION    0.02     0.19   188.79     0  01:23        0.19
  OF_Rear-yard         OUTFALL     0.00     0.00     0.00     0  00:00        0.00
  ST3_Low              OUTFALL     0.00     0.00   187.00     0  00:00        0.00
  ST5                  OUTFALL     0.00     0.00     0.00     0  00:00        0.00
  SU1                  STORAGE     0.01     0.34   189.11     0  01:23        0.34


  *******************
  Node Inflow Summary
  *******************

  ------------------------------------------------------------------------------------------------
                                 Maximum  Maximum                  Lateral       Total        Flow
```

DEL13-124P4 – Dover Coast Subdivision Phase 4
2-Year Design Storm Event – Post-Development PCSWMM Output

```
                                 Lateral    Total  Time of Max      Inflow      Inflow     Balance
                                  Inflow   Inflow   Occurrence      Volume      Volume       Error
Node                 Type           LPS      LPS  days hr:min   10^6 ltr    10^6 ltr     Percent
------------------------------------------------------------------------------------------------
J1                   JUNCTION      0.00    43.91     0  01:23           0       0.263       0.004
OF_Rear-yard         OUTFALL      60.90    60.90     0  01:15       0.103       0.103       0.000
ST3_Low              OUTFALL     238.31   275.36     0  01:15       0.586       0.849       0.000
ST5                  OUTFALL     186.05   186.05     0  01:15       0.391       0.391       0.000
SU1                  STORAGE     157.45   157.45     0  01:15       0.263       0.263      -0.000


  **********************
  Node Surcharge Summary
  **********************

  No nodes were surcharged.


  *********************
  Node Flooding Summary
  *********************

  No nodes were flooded.


  **********************
  Storage Volume Summary
  **********************

  ---------------------------------------------------------------------------------------------------------
                               Average    Avg   Evap  Exfil      Maximum    Max    Time of Max    Maximum
                                Volume   Pcnt   Pcnt   Pcnt       Volume   Pcnt     Occurrence    Outflow
  Storage Unit                1000 m³   Full   Loss   Loss      1000 m³   Full   days hr:min        LPS
  ---------------------------------------------------------------------------------------------------------
  SU1                           0.001    0.1    0.0    0.0       0.063    6.2      0  01:23      43.91


  ************************
  Outfall Loading Summary
  ************************

  ------------------------------------------------------------
                               Flow       Avg       Max     Total
                               Freq      Flow      Flow    Volume
  Outfall Node                 Pcnt       LPS       LPS  10^6 ltr
  ------------------------------------------------------------
  OF_Rear-yard                 7.77      7.71     60.90     0.103
  ST3_Low                     31.44     15.62    275.36     0.849
  ST5                         22.99      9.84    186.05     0.391
  ------------------------------------------------------------
  System                      20.73     33.17    522.30     1.344


  ********************
  Link Flow Summary
  ********************

  ------------------------------------------------------------------------------
                               Maximum  Time of Max   Maximum    Max/    Max/
                                |Flow|   Occurrence   |Veloc|    Full    Full
  Link                 Type        LPS  days hr:min     m/sec    Flow   Depth
  ------------------------------------------------------------------------------
  2                    CONDUIT    0.00     0  00:00      0.00    0.00    0.00
  4                    CONDUIT   43.91     0  01:23      0.95    0.46    0.44
  1                    ORIFICE   43.91     0  01:23                      1.00


  **************************
  Flow Classification Summary
```

****

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
2	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Fri Jul 18 09:55:40 2025
Analysis ended on: Fri Jul 18 09:55:40 2025
Total elapsed time: < 1 sec

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)
-------------------------------------------------------------

DEL13-124P4 - Post-Development

*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 4
Number of nodes ........... 5
Number of links ........... 3
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
------------------------------------------------------------------
Norfolk              Norfolk-5yr                 INTENSITY    5 min.


********************
Subcatchment Summary
********************
Name                         Area     Width   %Imperv    %Slope Rain Gage            Outlet
-----------------------------------------------------------------------------------------------
P1                           2.33     66.46     50.00    0.5000 Norfolk              ST5
P2                           3.02     71.15     59.00    0.5000 Norfolk              ST3_Low
P3                           2.54    169.13     23.00    2.0000 Norfolk              SU1
P4                           0.79    316.40     28.00    2.0000 Norfolk              OF_Rear-yard


************
Node Summary
************
                                    Invert      Max.    Ponded    External
Name                 Type            Elev.     Depth      Area    Inflow
-----------------------------------------------------------------------
J1                   JUNCTION       188.60      1.51       0.0
OF_Rear-yard         OUTFALL          0.00      0.00       0.0
ST3_Low              OUTFALL        187.00      1.90       0.0
ST5                  OUTFALL          0.00      0.00       0.0
SU1                  STORAGE        188.77      1.82       0.0


************
Link Summary
************
Name             From Node        To Node          Type            Length    %Slope Roughness
---------------------------------------------------------------------------------------------
2                SU1              J1               CONDUIT            1.0    9.0367    0.0130
4                J1               ST3_Low          CONDUIT           30.6    0.2941    0.0130
1                SU1              J1               ORIFICE


*********************
Cross Section Summary
*********************
                                  Full     Full     Hyd.     Max.   No. of     Full
Conduit          Shape           Depth     Area     Rad.    Width  Barrels     Flow
-----------------------------------------------------------------------------------
2                CIRCULAR         0.38     0.11     0.09     0.38        1   527.09
4                CIRCULAR         0.38     0.11     0.09     0.38        1    95.09
```

DEL13-124P4 – Dover Coast Subdivision Phase 4
5-Year Design Storm Event – Post-Development PCSWMM Output

```
***************
Analysis Options
***************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 04/10/2015 00:00:00
Ending Date .............. 04/12/2015 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 1.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 1
Head Tolerance ........... 0.001500 m


*************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
*************************     ---------       -------
Total Precipitation ......         0.390        44.904
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.165        19.021
Surface Runoff ...........         0.213        24.530
Final Storage ............         0.012         1.362
Continuity Error (%) .....        -0.020


*************************        Volume         Volume
Flow Routing Continuity        hectare-m      10^6 ltr
*************************     ---------      ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.213         2.129
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         0.213         2.129
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....         0.000


***************************
Time-Step Critical Elements
***************************
None


*********************************
Highest Flow Instability Indexes
*********************************
All links are stable.
```

```
  ********************************
  Most Frequent Nonconverging Nodes
  ********************************
  Convergence obtained at all time steps.


  ************************
  Routing Time Step Summary
  ************************
  Minimum Time Step           :     0.50 sec
  Average Time Step           :     1.00 sec
  Maximum Time Step           :     1.00 sec
  % of Time in Steady State   :     0.00
  Average Iterations per Step :     2.00
  % of Steps Not Converging   :     0.00
  Time Step Frequencies       :
      1.000 -  0.871 sec      :   100.00 %
      0.871 -  0.758 sec      :     0.00 %
      0.758 -  0.660 sec      :     0.00 %
      0.660 -  0.574 sec      :     0.00 %
      0.574 -  0.500 sec      :     0.00 %


  ***************************
  Subcatchment Runoff Summary
  ***************************

  ---------------------------------------------------------------------------------------------------------------
                           Total      Total      Total      Total     Imperv       Perv      Total      Total
      Peak  Runoff      Precip      Runon       Evap      Infil    Runoff     Runoff     Runoff     Runoff
    Runoff    Coeff  Subcatchment         mm         mm         mm         mm         mm         mm         mm    10^6 ltr
       LPS
  ---------------------------------------------------------------------------------------------------------------
    P1                     44.90       0.00       0.00      17.65      21.71       4.17      25.88       0.60
     276.29   0.576
    P2                     44.90       0.00       0.00      14.47      25.61       3.43      29.04       0.88
     361.05   0.647
    P3                     44.90       0.00       0.00      24.95       9.99       8.67      18.66       0.47
     221.21   0.416
    P4                     44.90       0.00       0.00      21.46      12.17       9.98      22.15       0.18
      91.76   0.493


  ******************
  Node Depth Summary
  ******************

  ----------------------------------------------------------------------------
                                  Average  Maximum  Maximum  Time of Max    Reported
                                    Depth    Depth      HGL   Occurrence  Max Depth
  Node                 Type       Meters   Meters   Meters  days hr:min      Meters
  ----------------------------------------------------------------------------
  J1                   JUNCTION     0.02     0.21   188.81     0  01:33        0.21
  OF_Rear-yard         OUTFALL      0.00     0.00     0.00     0  00:00        0.00
  ST3_Low              OUTFALL      0.00     0.00   187.00     0  00:00        0.00
  ST5                  OUTFALL      0.00     0.00     0.00     0  00:00        0.00
  SU1                  STORAGE      0.02     0.45   189.22     0  01:33        0.45


  *******************
  Node Inflow Summary
  *******************

  ----------------------------------------------------------------------------------------------
                                  Maximum  Maximum                  Lateral       Total        Flow
```


Node	Type	Lateral Inflow LPS	Total Inflow LPS	Time of Max Occurrence days hr:min	Inflow Volume 10^6 ltr	Inflow Volume 10^6 ltr	Balance Error Percent
J1	JUNCTION	0.00	53.18	0 01:33	0	0.473	0.002
OF_Rear-yard	OUTFALL	91.76	91.76	0 01:15	0.175	0.175	0.000
ST3_Low	OUTFALL	361.05	404.73	0 01:15	0.878	1.35	0.000
ST5	OUTFALL	276.29	276.29	0 01:15	0.602	0.602	0.000
SU1	STORAGE	221.21	221.21	0 01:15	0.473	0.473	-0.000

```
  **********************
  Node Surcharge Summary
  **********************

  No nodes were surcharged.


  *********************
  Node Flooding Summary
  *********************

  No nodes were flooded.


  **********************
  Storage Volume Summary
  **********************

  ----------------------------------------------------------------------------------------------------------
                            Average    Avg   Evap  Exfil      Maximum    Max    Time of Max    Maximum
                             Volume   Pcnt   Pcnt   Pcnt       Volume   Pcnt     Occurrence    Outflow
  Storage Unit           1000 m³     Full   Loss   Loss     1000 m³     Full   days hr:min        LPS
  ----------------------------------------------------------------------------------------------------------
  SU1                       0.004    0.4    0.0    0.0        0.100    9.8      0 01:33        53.18


  ************************
  Outfall Loading Summary
  ************************

  ---------------------------------------------------------
                          Flow      Avg      Max    Total
                          Freq     Flow     Flow   Volume
  Outfall Node            Pcnt      LPS      LPS  10^6 ltr
  ---------------------------------------------------------
  OF_Rear-yard            7.85    12.91    91.76    0.175
  ST3_Low                31.75    24.62   404.73    1.352
  ST5                    23.26    14.96   276.29    0.602
  ---------------------------------------------------------
  System                 20.95    52.50   772.77    2.129


  ********************
  Link Flow Summary
  ********************

  ---------------------------------------------------------------------------------
                                  Maximum  Time of Max   Maximum    Max/    Max/
                                   |Flow|   Occurrence   |Veloc|    Full    Full
  Link                 Type          LPS  days hr:min     m/sec    Flow   Depth
  ---------------------------------------------------------------------------------
  2                    CONDUIT      0.00     0 00:00      0.00    0.00    0.00
  4                    CONDUIT     53.18     0 01:33      1.01    0.56    0.48
  1                    ORIFICE     53.18     0 01:33                      1.00


  **************************
  Flow Classification Summary
```

****

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
2	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Fri Jul 18 09:59:48 2025
Analysis ended on: Fri Jul 18 09:59:48 2025
Total elapsed time: < 1 sec

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)
------------------------------------------------------------

DEL13-124P4 - Post-Development

*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 4
Number of nodes ........... 5
Number of links ........... 3
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
------------------------------------------------------------------
Norfolk              Norfolk-10yr                INTENSITY    5 min.


*******************
Subcatchment Summary
*******************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
-----------------------------------------------------------------------------------------------
P1                          2.33     66.46     50.00    0.5000 Norfolk              ST5
P2                          3.02     71.15     59.00    0.5000 Norfolk              ST3_Low
P3                          2.54    169.13     23.00    2.0000 Norfolk              SU1
P4                          0.79    316.40     28.00    2.0000 Norfolk              OF_Rear-yard


************
Node Summary
************
                                    Invert      Max.    Ponded    External
Name                 Type            Elev.     Depth      Area    Inflow
-----------------------------------------------------------------------
J1                   JUNCTION       188.60      1.51       0.0
OF_Rear-yard         OUTFALL          0.00      0.00       0.0
ST3_Low              OUTFALL        187.00      1.90       0.0
ST5                  OUTFALL          0.00      0.00       0.0
SU1                  STORAGE        188.77      1.82       0.0


************
Link Summary
************
Name            From Node        To Node          Type            Length    %Slope Roughness
-----------------------------------------------------------------------------------------
2               SU1              J1               CONDUIT            1.0    9.0367    0.0130
4               J1               ST3_Low          CONDUIT           30.6    0.2941    0.0130
1               SU1              J1               ORIFICE


*********************
Cross Section Summary
*********************
                                  Full     Full     Hyd.     Max.   No. of     Full
Conduit         Shape            Depth     Area     Rad.    Width  Barrels     Flow
-----------------------------------------------------------------------------------
2               CIRCULAR          0.38     0.11     0.09     0.38        1   527.09
4               CIRCULAR          0.38     0.11     0.09     0.38        1    95.09
```

DEL13-124P4 – Dover Coast Subdivision Phase 4
10-Year Design Storm Event – Post-Development PCSWMM Output

```
***************
Analysis Options
***************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 04/10/2015 00:00:00
Ending Date .............. 04/12/2015 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 1.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 1
Head Tolerance ........... 0.001500 m


*************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
*************************     ---------       -------
Total Precipitation ......         0.460        52.991
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.179        20.635
Surface Runoff ...........         0.269        30.999
Final Storage ............         0.012         1.368
Continuity Error (%) .....        -0.021


*************************        Volume         Volume
Flow Routing Continuity        hectare-m      10^6 ltr
*************************     ---------      ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.269         2.690
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         0.269         2.690
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....         0.000


***************************
Time-Step Critical Elements
***************************
None


*********************************
Highest Flow Instability Indexes
*********************************
All links are stable.
```

****
Most Frequent Nonconverging Nodes
****
Convergence obtained at all time steps.

****
Routing Time Step Summary
****
Minimum Time Step : 0.50 sec
Average Time Step : 1.00 sec
Maximum Time Step : 1.00 sec
% of Time in Steady State : 0.00
Average Iterations per Step : 2.00
% of Steps Not Converging : 0.00
Time Step Frequencies :
1.000 - 0.871 sec : 100.00 %
0.871 - 0.758 sec : 0.00 %
0.758 - 0.660 sec : 0.00 %
0.660 - 0.574 sec : 0.00 %
0.574 - 0.500 sec : 0.00 %

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip mm	Total Runon mm	Total Evap mm	Total Infil mm	Imperv Runoff mm	Perv Runoff mm	Total Runoff mm	Total Runoff 10^6 ltr	Peak Runoff LPS	Runoff Coeff
P1	52.99	0.00	0.00	19.23	25.75	6.64	32.39	0.75	337.08	0.611
P2	52.99	0.00	0.00	15.76	30.38	5.45	35.83	1.08	444.41	0.676
P3	52.99	0.00	0.00	26.95	11.85	12.88	24.74	0.63	266.18	0.467
P4	52.99	0.00	0.00	23.17	14.44	14.09	28.53	0.23	120.33	0.538

****
Node Depth Summary
****

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
J1	JUNCTION	0.03	0.22	188.82	0 02:00	0.22
OF_Rear-yard	OUTFALL	0.00	0.00	0.00	0 00:00	0.00
ST3_Low	OUTFALL	0.00	0.00	187.00	0 00:00	0.00
ST5	OUTFALL	0.00	0.00	0.00	0 00:00	0.00
SU1	STORAGE	0.03	0.58	189.35	0 02:00	0.58

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow LPS	Maximum Total Inflow LPS	Time of Max Occurrence days hr:min	Inflow Volume 10^6 ltr	Inflow Volume 10^6 ltr	Balance Error Percent
J1	JUNCTION	0.00	62.54	0 02:00	0	0.628	0.002
OF_Rear-yard	OUTFALL	120.33	120.33	0 01:15	0.226	0.226	0.000
ST3_Low	OUTFALL	444.41	492.13	0 01:15	1.08	1.71	0.000
ST5	OUTFALL	337.08	337.08	0 01:15	0.753	0.753	0.000
SU1	STORAGE	266.18	266.18	0 01:15	0.628	0.628	-0.000

DEL13-124P4 – Dover Coast Subdivision Phase 4
10-Year Design Storm Event – Post-Development PCSWMM Output

****
Node Surcharge Summary
****

No nodes were surcharged.

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 m³	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m³	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow LPS
SU1	0.007	0.7	0.0	0.0	0.150	14.8	0 02:00	62.54

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow LPS	Max Flow LPS	Total Volume 10^6 ltr
OF_Rear-yard	7.93	16.47	120.33	0.226
ST3_Low	31.87	31.06	492.13	1.711
ST5	23.36	18.65	337.08	0.753
System	21.05	66.17	949.54	2.690

****
Link Flow Summary
****

Link	Type	Maximum |Flow| LPS	Time of Max Occurrence days hr:min	Maximum |Veloc| m/sec	Max/ Full Flow	Max/ Full Depth
2	CONDUIT	0.00	0 00:00	0.00	0.00	0.00
4	CONDUIT	62.54	0 02:01	1.06	0.66	0.53
1	ORIFICE	62.54	0 02:00			1.00

****
Flow Classification Summary

****

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
2	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Fri Jul 18 10:27:10 2025
Analysis ended on: Fri Jul 18 10:27:10 2025
Total elapsed time: < 1 sec

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)
-------------------------------------------------------------

DEL13-124P4 - Post-Development

*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 4
Number of nodes ........... 5
Number of links ........... 3
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
------------------------------------------------------------------
Norfolk              Norfolk-25yr                INTENSITY    5 min.


*******************
Subcatchment Summary
*******************
Name                         Area     Width   %Imperv    %Slope Rain Gage            Outlet
-----------------------------------------------------------------------------------------------
P1                           2.33     66.46     50.00    0.5000 Norfolk              ST5
P2                           3.02     71.15     59.00    0.5000 Norfolk              ST3_Low
P3                           2.54    169.13     23.00    2.0000 Norfolk              SU1
P4                           0.79    316.40     28.00    2.0000 Norfolk              OF_Rear-yard


************
Node Summary
************
                                    Invert      Max.    Ponded    External
Name                 Type            Elev.     Depth      Area    Inflow
-----------------------------------------------------------------------
J1                   JUNCTION       188.60      1.51       0.0
OF_Rear-yard         OUTFALL          0.00      0.00       0.0
ST3_Low              OUTFALL        187.00      1.90       0.0
ST5                  OUTFALL          0.00      0.00       0.0
SU1                  STORAGE        188.77      1.82       0.0


************
Link Summary
************
Name             From Node        To Node          Type            Length    %Slope Roughness
---------------------------------------------------------------------------------------------
2                SU1              J1               CONDUIT            1.0    9.0367    0.0130
4                J1               ST3_Low          CONDUIT           30.6    0.2941    0.0130
1                SU1              J1               ORIFICE


*********************
Cross Section Summary
*********************
                                  Full     Full     Hyd.     Max.   No. of     Full
Conduit          Shape           Depth     Area     Rad.    Width  Barrels     Flow
-----------------------------------------------------------------------------------
2                CIRCULAR         0.38     0.11     0.09     0.38        1   527.09
4                CIRCULAR         0.38     0.11     0.09     0.38        1    95.09
```

DEL13-124P4 – Dover Coast Subdivision Phase 4
25-Year Design Storm Event – Post-Development PCSWMM Output

```
****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 04/10/2015 00:00:00
Ending Date .............. 04/12/2015 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 1.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 1
Head Tolerance ........... 0.001500 m


*************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
*************************     ---------       -------
Total Precipitation ......         0.548        63.151
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.194        22.345
Surface Runoff ...........         0.342        39.456
Final Storage ............         0.012         1.365
Continuity Error (%) .....        -0.024


*************************        Volume         Volume
Flow Routing Continuity        hectare-m      10^6 ltr
*************************     ---------      ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.342         3.424
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         0.342         3.424
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....         0.000


***************************
Time-Step Critical Elements
***************************
Link 2 (6.00%)


*******************************
Highest Flow Instability Indexes
*******************************
All links are stable.
```

```
  *********************************
  Most Frequent Nonconverging Nodes
  *********************************
  Convergence obtained at all time steps.


  ************************
  Routing Time Step Summary
  ************************
  Minimum Time Step           :     0.50 sec
  Average Time Step           :     0.97 sec
  Maximum Time Step           :     1.00 sec
  % of Time in Steady State   :     0.00
  Average Iterations per Step :     2.00
  % of Steps Not Converging   :     0.00
  Time Step Frequencies       :
      1.000 -  0.871 sec      :    94.06 %
      0.871 -  0.758 sec      :     0.07 %
      0.758 -  0.660 sec      :     0.10 %
      0.660 -  0.574 sec      :     0.15 %
      0.574 -  0.500 sec      :     5.62 %


  ***************************
  Subcatchment Runoff Summary
  ***************************

  ---------------------------------------------------------------------------------------------------------------
                                Total      Total      Total      Total     Imperv       Perv      Total
Total     Peak  Runoff
                               Precip     Runon       Evap      Infil    Runoff     Runoff     Runoff
Runoff   Runoff   Coeff
  Subcatchment                    mm         mm         mm         mm         mm         mm         mm    10^6
ltr      LPS
  ---------------------------------------------------------------------------------------------------------------
  P1                           63.15       0.00       0.00      20.88      30.83      10.07      40.90
0.95   421.45   0.648
  P2                           63.15       0.00       0.00      17.11      36.38       8.26      44.64
1.35   559.16   0.707
  P3                           63.15       0.00       0.00      29.09      14.20      18.56      32.76
0.83   335.36   0.519
  P4                           63.15       0.00       0.00      25.01      17.29      19.57      36.86
0.29   166.81   0.584


  ******************
  Node Depth Summary
  ******************

  ---------------------------------------------------------------------------
                                Average  Maximum  Maximum  Time of Max    Reported
                                  Depth    Depth      HGL   Occurrence  Max Depth
  Node                 Type      Meters   Meters   Meters  days hr:min      Meters
  ---------------------------------------------------------------------------
  J1                   JUNCTION    0.04     0.30   188.90     0  01:41        0.30
  OF_Rear-yard         OUTFALL     0.00     0.00     0.00     0  00:00        0.00
  ST3_Low              OUTFALL     0.00     0.00   187.00     0  00:00        0.00
  ST5                  OUTFALL     0.00     0.00     0.00     0  00:00        0.00
  SU1                  STORAGE     0.06     0.67   189.44     0  01:41        0.67


  *******************
  Node Inflow Summary
  *******************

  -------------------------------------------------------------------------------------------------
                                Maximum  Maximum                  Lateral       Total        Flow
```

DEL13-124P4 – Dover Coast Subdivision Phase 4
25-Year Design Storm Event – Post-Development PCSWMM Output

```
                                Lateral    Total  Time of Max      Inflow      Inflow     Balance
                                 Inflow   Inflow   Occurrence      Volume      Volume       Error
Node                 Type           LPS      LPS  days hr:min    10^6 ltr    10^6 ltr     Percent
-------------------------------------------------------------------------------------------------
J1                   JUNCTION      0.00   102.47     0  01:41           0       0.831       0.001
OF_Rear-yard         OUTFALL     166.81   166.81     0  01:15       0.292       0.292       0.000
ST3_Low              OUTFALL     559.16   611.55     0  01:15        1.35        2.18       0.000
ST5                  OUTFALL     421.45   421.45     0  01:15       0.951       0.951       0.000
SU1                  STORAGE     335.36   335.36     0  01:15       0.831       0.831      -0.000


  **********************
  Node Surcharge Summary
  **********************

  No nodes were surcharged.


  *********************
  Node Flooding Summary
  *********************

  No nodes were flooded.


  **********************
  Storage Volume Summary
  **********************

  ---------------------------------------------------------------------------------------------------------
                                Average    Avg   Evap  Exfil      Maximum    Max    Time of Max    Maximum
                                 Volume   Pcnt   Pcnt   Pcnt       Volume   Pcnt     Occurrence    Outflow
  Storage Unit                  1000 m³   Full   Loss   Loss      1000 m³   Full  days hr:min        LPS
  ---------------------------------------------------------------------------------------------------------
  SU1                             0.014    1.4    0.0    0.0        0.188   18.5        0  01:41     102.47


  ************************
  Outfall Loading Summary
  ************************

  ---------------------------------------------------------
                                Flow      Avg      Max    Total
                                Freq     Flow     Flow   Volume
  Outfall Node                  Pcnt      LPS      LPS  10^6 ltr
  ---------------------------------------------------------
  OF_Rear-yard                 10.67    23.20   166.81    0.292
  ST3_Low                      33.98    53.74   611.55    2.181
  ST5                          25.70    30.04   421.45    0.951
  ---------------------------------------------------------
  System                       23.45   106.98  1199.80    3.424


  ********************
  Link Flow Summary
  ********************

  -------------------------------------------------------------------------------
                                Maximum  Time of Max   Maximum    Max/    Max/
                                 |Flow|   Occurrence   |Veloc|    Full    Full
  Link                 Type         LPS  days hr:min     m/sec    Flow   Depth
  -------------------------------------------------------------------------------
  2                    CONDUIT    36.41     0  01:41      2.74    0.07    0.18
  4                    CONDUIT   102.47     0  01:42      1.23    1.08    0.71
  1                    ORIFICE    67.06     0  01:30                      1.00


  **************************
  Flow Classification Summary
```

****

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
2	1.00	0.97	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00
4	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00

****
Conduit Surcharge Summary
****

Conduit	Hours Full: Both Ends	Upstream	Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
4	0.01	0.01	0.01	0.39	0.01

Analysis begun on: Fri Jul 18 10:32:02 2025
Analysis ended on: Fri Jul 18 10:32:02 2025
Total elapsed time: < 1 sec

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)
------------------------------------------------------------

DEL13-124P4 - Post-Development

*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 4
Number of nodes ........... 5
Number of links ........... 3
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
------------------------------------------------------------------
Norfolk              Norfolk-50yr                INTENSITY    5 min.


*******************
Subcatchment Summary
*******************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
-----------------------------------------------------------------------------------------------
P1                          2.33     66.46     50.00    0.5000 Norfolk              ST5
P2                          3.02     71.15     59.00    0.5000 Norfolk              ST3_Low
P3                          2.54    169.13     23.00    2.0000 Norfolk              SU1
P4                          0.79    316.40     28.00    2.0000 Norfolk              OF_Rear-yard


************
Node Summary
************
                                    Invert      Max.    Ponded    External
Name                 Type            Elev.     Depth      Area    Inflow
-----------------------------------------------------------------------
J1                   JUNCTION       188.60      1.51       0.0
OF_Rear-yard         OUTFALL          0.00      0.00       0.0
ST3_Low              OUTFALL        187.00      1.90       0.0
ST5                  OUTFALL          0.00      0.00       0.0
SU1                  STORAGE        188.77      1.82       0.0


************
Link Summary
************
Name             From Node        To Node          Type            Length    %Slope Roughness
-----------------------------------------------------------------------------------------------
2                SU1              J1               CONDUIT            1.0    9.0367    0.0130
4                J1               ST3_Low          CONDUIT           30.6    0.2941    0.0130
1                SU1              J1               ORIFICE


*********************
Cross Section Summary
*********************
                                   Full     Full     Hyd.     Max.   No. of     Full
Conduit          Shape            Depth     Area     Rad.    Width  Barrels     Flow
-----------------------------------------------------------------------------------
2                CIRCULAR          0.38     0.11     0.09     0.38        1   527.09
4                CIRCULAR          0.38     0.11     0.09     0.38        1    95.09
```

DEL13-124P4 – Dover Coast Subdivision Phase 4
50-Year Design Storm Event – Post-Development PCSWMM Output

```
****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 04/10/2015 00:00:00
Ending Date .............. 04/12/2015 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 1.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 1
Head Tolerance ........... 0.001500 m


*************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
*************************     ---------       -------
Total Precipitation ......         0.617        71.090
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.204        23.455
Surface Runoff ...........         0.402        46.288
Final Storage ............         0.012         1.364
Continuity Error (%) .....        -0.024


*************************        Volume         Volume
Flow Routing Continuity        hectare-m      10^6 ltr
*************************     ---------      ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.402         4.016
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         0.402         4.016
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....         0.000


***************************
Time-Step Critical Elements
***************************
Link 2 (7.25%)


*******************************
Highest Flow Instability Indexes
*******************************
All links are stable.
```

```
  *********************************
  Most Frequent Nonconverging Nodes
  *********************************
  Convergence obtained at all time steps.


  ************************
  Routing Time Step Summary
  ************************
  Minimum Time Step           :     0.09 sec
  Average Time Step           :     0.96 sec
  Maximum Time Step           :     1.00 sec
  % of Time in Steady State   :     0.00
  Average Iterations per Step :     2.00
  % of Steps Not Converging   :     0.00
  Time Step Frequencies       :
      1.000 -  0.871 sec      :    92.77 %
      0.871 -  0.758 sec      :     0.03 %
      0.758 -  0.660 sec      :     0.04 %
      0.660 -  0.574 sec      :     0.06 %
      0.574 -  0.500 sec      :     7.09 %


  ***************************
  Subcatchment Runoff Summary
  ***************************

  ---------------------------------------------------------------------------------------------------------------
                                Total      Total      Total      Total     Imperv       Perv      Total
Total     Peak  Runoff
                               Precip     Runon       Evap      Infil    Runoff     Runoff     Runoff
Runoff   Runoff   Coeff
  Subcatchment                   mm         mm         mm         mm         mm         mm         mm    10^6
ltr      LPS
  ---------------------------------------------------------------------------------------------------------------
  P1                           71.09       0.00       0.00      21.94      34.80      12.98      47.78
1.11   487.41   0.672
  P2                           71.09       0.00       0.00      17.98      41.06      10.65      51.71
1.56   649.24   0.727
  P3                           71.09       0.00       0.00      30.50      16.02      23.27      39.29
1.00   392.13   0.553
  P4                           71.09       0.00       0.00      26.23      19.52      24.06      43.58
0.34   206.52   0.613


  ******************
  Node Depth Summary
  ******************

  ------------------------------------------------------------------------
                               Average  Maximum  Maximum  Time of Max    Reported
                                 Depth    Depth      HGL   Occurrence  Max Depth
  Node                 Type      Meters   Meters   Meters  days hr:min      Meters
  ------------------------------------------------------------------------
  J1                   JUNCTION    0.04     0.41   189.01     0  01:35        0.41
  OF_Rear-yard         OUTFALL     0.00     0.00     0.00     0  00:00        0.00
  ST3_Low              OUTFALL     0.00     0.00   187.00     0  00:00        0.00
  ST5                  OUTFALL     0.00     0.00     0.00     0  00:00        0.00
  SU1                  STORAGE     0.06     0.70   189.47     0  01:35        0.70


  *******************
  Node Inflow Summary
  *******************

  ------------------------------------------------------------------------------------------------
                                 Maximum  Maximum                  Lateral       Total        Flow
```



```
                                 Lateral    Total  Time of Max      Inflow      Inflow     Balance
                                  Inflow   Inflow   Occurrence      Volume      Volume       Error
Node                 Type           LPS      LPS  days hr:min   10^6 ltr    10^6 ltr     Percent
------------------------------------------------------------------------------------------------
J1                   JUNCTION      0.00   139.25     0  01:35           0       0.997       0.001
OF_Rear-yard         OUTFALL     206.52   206.52     0  01:15       0.345       0.345       0.000
ST3_Low              OUTFALL     649.24   705.09     0  01:15        1.56        2.56       0.000
ST5                  OUTFALL     487.41   487.41     0  01:15        1.11        1.11       0.000
SU1                  STORAGE     392.13   392.13     0  01:15       0.997       0.997      -0.000


  **********************
  Node Surcharge Summary
  **********************

  No nodes were surcharged.


  *********************
  Node Flooding Summary
  *********************

  No nodes were flooded.


  **********************
  Storage Volume Summary
  **********************

  ------------------------------------------------------------------------------------------------------------
                               Average    Avg   Evap  Exfil      Maximum    Max    Time of Max    Maximum
                                Volume   Pcnt   Pcnt   Pcnt       Volume   Pcnt     Occurrence    Outflow
  Storage Unit                1000 m³   Full   Loss   Loss      1000 m³   Full   days hr:min        LPS
  ------------------------------------------------------------------------------------------------------------
  SU1                           0.016    1.6    0.0    0.0        0.202   19.9     0  01:35      139.25


  ************************
  Outfall Loading Summary
  ************************

  ------------------------------------------------------------
                               Flow       Avg       Max     Total
                               Freq      Flow      Flow    Volume
  Outfall Node                 Pcnt       LPS       LPS  10^6 ltr
  ------------------------------------------------------------
  OF_Rear-yard                11.35     27.75    206.52     0.345
  ST3_Low                     34.52     66.98    705.09     2.560
  ST5                         26.29     37.13    487.41     1.111
  ------------------------------------------------------------
  System                      24.05    131.86   1399.03     4.016


  ********************
  Link Flow Summary
  ********************

  ------------------------------------------------------------------------------
                               Maximum  Time of Max   Maximum    Max/    Max/
                                |Flow|   Occurrence   |Veloc|    Full    Full
  Link                 Type        LPS  days hr:min     m/sec    Flow   Depth
  ------------------------------------------------------------------------------
  2                    CONDUIT   78.00     0  01:35      3.42    0.15    0.26
  4                    CONDUIT  139.25     0  01:35      1.37    1.46    0.87
  1                    ORIFICE   67.16     0  01:21                      1.00


  **************************
  Flow Classification Summary
```

****

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
2	1.00	0.96	0.00	0.00	0.00	0.00	0.04	0.00	0.00
4	1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00

****
Conduit Surcharge Summary
****

Conduit	Hours Full: Both Ends	Upstream	Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
4	0.01	0.26	0.01	0.95	0.01

Analysis begun on: Fri Jul 18 10:35:40 2025
Analysis ended on: Fri Jul 18 10:35:41 2025
Total elapsed time: 00:00:01

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)
------------------------------------------------------------

DEL13-124P4 - Post-Development

*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 4
Number of nodes ........... 5
Number of links ........... 3
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
------------------------------------------------------------------
Norfolk              Norfolk-100yr               INTENSITY    5 min.


*******************
Subcatchment Summary
*******************
Name                        Area     Width   %Imperv    %Slope Rain Gage            Outlet
-----------------------------------------------------------------------------------------------
P1                          2.33     66.46     50.00    0.5000 Norfolk              ST5
P2                          3.02     71.15     59.00    0.5000 Norfolk              ST3_Low
P3                          2.54    169.13     23.00    2.0000 Norfolk              SU1
P4                          0.79    316.40     28.00    2.0000 Norfolk              OF_Rear-yard


************
Node Summary
************
                                    Invert      Max.    Ponded    External
Name                 Type            Elev.     Depth      Area    Inflow
-----------------------------------------------------------------------
J1                   JUNCTION       188.60      1.51       0.0
OF_Rear-yard         OUTFALL          0.00      0.00       0.0
ST3_Low              OUTFALL        187.00      1.90       0.0
ST5                  OUTFALL          0.00      0.00       0.0
SU1                  STORAGE        188.77      1.82       0.0


************
Link Summary
************
Name            From Node        To Node          Type            Length    %Slope Roughness
-----------------------------------------------------------------------------------------
2               SU1              J1               CONDUIT            1.0    9.0367    0.0130
4               J1               ST3_Low          CONDUIT           30.6    0.2941    0.0130
1               SU1              J1               ORIFICE


*********************
Cross Section Summary
*********************
                                  Full     Full     Hyd.     Max.   No. of     Full
Conduit         Shape            Depth     Area     Rad.    Width  Barrels     Flow
-----------------------------------------------------------------------------------
2               CIRCULAR          0.38     0.11     0.09     0.38        1   527.09
4               CIRCULAR          0.38     0.11     0.09     0.38        1    95.09
```

DEL13-124P4 – Dover Coast Subdivision Phase 4
50-Year Design Storm Event – Post-Development PCSWMM Output

```
****************
Analysis Options
****************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 04/10/2015 00:00:00
Ending Date .............. 04/12/2015 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 1.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 1
Head Tolerance ........... 0.001500 m


*************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
*************************     ---------       -------
Total Precipitation ......         0.684        78.830
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.212        24.396
Surface Runoff ...........         0.461        53.089
Final Storage ............         0.012         1.366
Continuity Error (%) .....        -0.026


*************************        Volume         Volume
Flow Routing Continuity        hectare-m      10^6 ltr
*************************     ---------      ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         0.461         4.606
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         0.461         4.606
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.000         0.000
Continuity Error (%) .....         0.000


***************************
Time-Step Critical Elements
***************************
Link 2 (7.74%)


*********************************
Highest Flow Instability Indexes
*********************************
All links are stable.
```

```
  *********************************
  Most Frequent Nonconverging Nodes
  *********************************
  Convergence obtained at all time steps.


  ************************
  Routing Time Step Summary
  ************************
  Minimum Time Step           :     0.03 sec
  Average Time Step           :     0.96 sec
  Maximum Time Step           :     1.00 sec
  % of Time in Steady State   :     0.00
  Average Iterations per Step :     2.00
  % of Steps Not Converging   :     0.00
  Time Step Frequencies       :
      1.000 -  0.871 sec      :    92.27 %
      0.871 -  0.758 sec      :     0.03 %
      0.758 -  0.660 sec      :     0.04 %
      0.660 -  0.574 sec      :     0.05 %
      0.574 -  0.500 sec      :     7.61 %


  ***************************
  Subcatchment Runoff Summary
  ***************************

  ---------------------------------------------------------------------------------------------------------------
                           Total      Total      Total      Total     Imperv       Perv      Total      Total
      Peak  Runoff
                          Precip     Runon       Evap      Infil    Runoff     Runoff     Runoff     Runoff
    Runoff   Coeff
  Subcatchment                mm         mm         mm         mm         mm         mm         mm    10^6
ltr      LPS
  ---------------------------------------------------------------------------------------------------------------
  P1                        78.83       0.00       0.00      22.83      38.68      15.96      54.63
1.27   555.27   0.693
  P2                        78.83       0.00       0.00      18.71      45.63      13.09      58.73
1.78   741.63   0.745
  P3                        78.83       0.00       0.00      31.71      17.81      28.03      45.84
1.16   453.34   0.581
  P4                        78.83       0.00       0.00      27.29      21.69      28.58      50.27
0.40   248.86   0.638


  ******************
  Node Depth Summary
  ******************

  ------------------------------------------------------------------------
                                Average  Maximum  Maximum  Time of Max    Reported
                                  Depth    Depth      HGL   Occurrence  Max Depth
  Node                 Type      Meters   Meters   Meters  days hr:min      Meters
  ------------------------------------------------------------------------
  J1                   JUNCTION    0.05     0.55   189.15     0  01:30        0.55
  OF_Rear-yard         OUTFALL     0.00     0.00     0.00     0  00:00        0.00
  ST3_Low              OUTFALL     0.00     0.00   187.00     0  00:00        0.00
  ST5                  OUTFALL     0.00     0.00     0.00     0  00:00        0.00
  SU1                  STORAGE     0.07     0.72   189.49     0  01:30        0.72


  *******************
  Node Inflow Summary
  *******************

  ------------------------------------------------------------------------------------------------
                                Maximum  Maximum                  Lateral       Total        Flow
```



```
                                Lateral    Total  Time of Max      Inflow      Inflow     Balance
                                 Inflow   Inflow   Occurrence      Volume      Volume       Error
Node                 Type           LPS      LPS  days hr:min   10^6 ltr    10^6 ltr     Percent
------------------------------------------------------------------------------------------------
J1                   JUNCTION      0.00   178.36     0  01:30           0        1.16       0.002
OF_Rear-yard         OUTFALL     248.86   248.86     0  01:15       0.398       0.398       0.000
ST3_Low              OUTFALL     741.63   800.71     0  01:15        1.78        2.94       0.000
ST5                  OUTFALL     555.27   555.27     0  01:15        1.27        1.27       0.000
SU1                  STORAGE     453.34   453.34     0  01:15        1.16        1.16      -0.000


  **********************
  Node Surcharge Summary
  **********************

  No nodes were surcharged.


  *********************
  Node Flooding Summary
  *********************

  No nodes were flooded.


  **********************
  Storage Volume Summary
  **********************

  ------------------------------------------------------------------------------------------------------
                            Average    Avg   Evap  Exfil      Maximum    Max    Time of Max    Maximum
                             Volume   Pcnt   Pcnt   Pcnt       Volume   Pcnt     Occurrence    Outflow
  Storage Unit            1000 m³   Full   Loss   Loss      1000 m³   Full   days hr:min        LPS
  ------------------------------------------------------------------------------------------------------
  SU1                       0.018    1.7    0.0    0.0        0.215   21.1     0  01:30     178.36


  ************************
  Outfall Loading Summary
  ************************

  ------------------------------------------------------------
                            Flow       Avg       Max     Total
                            Freq      Flow      Flow    Volume
  Outfall Node              Pcnt       LPS       LPS  10^6 ltr
  ------------------------------------------------------------
  OF_Rear-yard             11.63     32.20    248.86     0.398
  ST3_Low                  34.76     78.85    800.71     2.938
  ST5                      26.54     43.59    555.27     1.271
  ------------------------------------------------------------
  System                   24.31    154.63   1604.83     4.606


  ********************
  Link Flow Summary
  ********************

  ------------------------------------------------------------------------------
                            Maximum  Time of Max   Maximum    Max/    Max/
                             |Flow|   Occurrence   |Veloc|    Full    Full
  Link                 Type      LPS  days hr:min     m/sec    Flow   Depth
  ------------------------------------------------------------------------------
  2                    CONDUIT    125.09     0  01:30       3.91    0.24    0.33
  4                    CONDUIT    178.33     0  01:30       1.69    1.88    0.91
  1                    ORIFICE     67.28     0  01:18                       1.00


  ***************************
  Flow Classification Summary
```

****

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class: Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
2	1.00	0.96	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00
4	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00

****
Conduit Surcharge Summary
****

Conduit	Hours Full: Both Ends	Upstream	Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
4	0.01	0.68	0.01	1.28	0.01

Analysis begun on: Fri Jul 18 10:40:41 2025
Analysis ended on: Fri Jul 18 10:40:42 2025
Total elapsed time: 00:00:01

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.2 (Build 5.2.4)
-----------------------------------------------------------

DEL13-124P4 - Post-Development

*************
Element Count
*************
Number of rain gages ...... 1
Number of subcatchments ... 4
Number of nodes ........... 5
Number of links ........... 3
Number of pollutants ...... 0
Number of land uses ....... 0


****************
Raingage Summary
****************
                                                 Data       Recording
Name                 Data Source                 Type       Interval
------------------------------------------------------------------------
Norfolk              Hurricane_Hazel_48          VOLUME      60 min.


*******************
Subcatchment Summary
*******************
Name                         Area     Width   %Imperv    %Slope Rain Gage            Outlet
-----------------------------------------------------------------------------------------------
P1                           2.33     66.46     50.00    0.5000 Norfolk              ST5
P2                           3.02     71.15     59.00    0.5000 Norfolk              ST3_Low
P3                           2.54    169.13     23.00    2.0000 Norfolk              SU1
P4                           0.79    316.40     28.00    2.0000 Norfolk              OF_Rear-yard


************
Node Summary
************
                                    Invert      Max.    Ponded    External
Name                 Type            Elev.     Depth      Area    Inflow
-------------------------------------------------------------------------
J1                   JUNCTION       188.60      1.51       0.0
OF_Rear-yard         OUTFALL          0.00      0.00       0.0
ST3_Low              OUTFALL        187.00      1.90       0.0
ST5                  OUTFALL          0.00      0.00       0.0
SU1                  STORAGE        188.77      1.82       0.0


************
Link Summary
************
Name             From Node        To Node          Type            Length    %Slope Roughness
---------------------------------------------------------------------------------------------
2                SU1              J1               CONDUIT            1.0    9.0367    0.0130
4                J1               ST3_Low          CONDUIT           30.6    0.2941    0.0130
1                SU1              J1               ORIFICE


*********************
Cross Section Summary
*********************
                                    Full     Full     Hyd.     Max.   No. of     Full
Conduit          Shape             Depth     Area     Rad.    Width  Barrels     Flow
-----------------------------------------------------------------------------------------
2                CIRCULAR           0.38     0.11     0.09     0.38        1   527.09
4                CIRCULAR           0.38     0.11     0.09     0.38        1    95.09
```

DEL13-124P4 – Dover Coast Subdivision Phase 4
Hurricane Hazel Design Storm Event – Post-Development PCSWMM Output

```
***************
Analysis Options
***************
Flow Units ............... LPS
Process Models:
  Rainfall/Runoff ........ YES
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ YES
  Water Quality .......... NO
Infiltration Method ...... CURVE_NUMBER
Flow Routing Method ...... DYNWAVE
Surcharge Method ......... EXTRAN
Starting Date ............ 04/10/2015 00:00:00
Ending Date .............. 04/12/2015 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:01:00
Wet Time Step ............ 00:01:00
Dry Time Step ............ 00:01:00
Routing Time Step ........ 1.00 sec
Variable Time Step ....... YES
Maximum Trials ........... 8
Number of Threads ........ 1
Head Tolerance ........... 0.001500 m


*************************        Volume         Depth
Runoff Quantity Continuity     hectare-m            mm
*************************     ---------       -------
Total Precipitation ......         2.473       285.001
Evaporation Loss .........         0.000         0.000
Infiltration Loss ........         0.230        26.470
Surface Runoff ...........         2.090       240.885
Final Storage ............         0.154        17.779
Continuity Error (%) .....        -0.047


*************************        Volume         Volume
Flow Routing Continuity        hectare-m      10^6 ltr
*************************     ---------      ---------
Dry Weather Inflow .......         0.000         0.000
Wet Weather Inflow .......         2.089        20.893
Groundwater Inflow .......         0.000         0.000
RDII Inflow ..............         0.000         0.000
External Inflow ..........         0.000         0.000
External Outflow .........         2.070        20.698
Flooding Loss ............         0.000         0.000
Evaporation Loss .........         0.000         0.000
Exfiltration Loss ........         0.000         0.000
Initial Stored Volume ....         0.000         0.000
Final Stored Volume ......         0.019         0.194
Continuity Error (%) .....         0.002


***************************
Time-Step Critical Elements
***************************
Link 2 (26.69%)


*********************************
Highest Flow Instability Indexes
*********************************
All links are stable.
```

```
  ********************************
  Most Frequent Nonconverging Nodes
  ********************************
  Convergence obtained at all time steps.


  ************************
  Routing Time Step Summary
  ************************
  Minimum Time Step           :     0.07 sec
  Average Time Step           :     0.87 sec
  Maximum Time Step           :     1.00 sec
  % of Time in Steady State   :     0.00
  Average Iterations per Step :     2.00
  % of Steps Not Converging   :     0.00
  Time Step Frequencies       :
      1.000 -  0.871 sec      :    73.32 %
      0.871 -  0.758 sec      :     0.01 %
      0.758 -  0.660 sec      :     0.02 %
      0.660 -  0.574 sec      :     0.03 %
      0.574 -  0.500 sec      :    26.62 %


  ***************************
  Subcatchment Runoff Summary
  ***************************

  ---------------------------------------------------------------------------------------------------------------
------------------
                             Total      Total      Total      Total     Imperv       Perv      Total
Total     Peak  Runoff
                            Precip      Runon       Evap      Infil     Runoff     Runoff     Runoff
Runoff   Runoff   Coeff
  Subcatchment                 mm         mm         mm         mm         mm         mm         mm    10^6
ltr      LPS
  ---------------------------------------------------------------------------------------------------------------
------------------
  P1                         285.00       0.00       0.00      23.32     139.73     100.37     240.10
5.58   296.76   0.842
  P2                         285.00       0.00       0.00      19.12     164.27      82.35     246.61
7.46   396.47   0.865
  P3                         285.00       0.00       0.00      35.91      64.99     168.69     233.68
5.93   344.10   0.820
  P4                         285.00       0.00       0.00      33.58      79.30     165.10     244.41
1.93   113.20   0.858


  ******************
  Node Depth Summary
  ******************

  ------------------------------------------------------------------------
                                Average  Maximum  Maximum  Time of Max    Reported
                                  Depth    Depth      HGL   Occurrence   Max Depth
  Node                 Type      Meters   Meters   Meters  days hr:min      Meters
  ------------------------------------------------------------------------
  J1                   JUNCTION    0.21     1.12   189.72     1  22:12        1.12
  OF_Rear-yard         OUTFALL     0.00     0.00     0.00     0  00:00        0.00
  ST3_Low              OUTFALL     0.00     0.00   187.00     0  00:00        0.00
  ST5                  OUTFALL     0.00     0.00     0.00     0  00:00        0.00
  SU1                  STORAGE     0.27     0.97   189.74     1  22:12        0.97


  *******************
  Node Inflow Summary
  *******************

  ---------------------------------------------------------------------------------------------------
                                Maximum  Maximum                  Lateral       Total        Flow
```



```
                                Lateral    Total  Time of Max      Inflow      Inflow     Balance
                                Inflow   Inflow   Occurrence      Volume      Volume       Error
Node                 Type          LPS      LPS  days hr:min   10^6 ltr    10^6 ltr     Percent
---------------------------------------------------------------------------------------------------
J1                   JUNCTION     0.00   294.29     1  22:09          0        5.73       0.053
OF_Rear-yard         OUTFALL    113.20   113.20     1  22:00       1.93        1.93       0.000
ST3_Low              OUTFALL    396.47   688.50     1  22:00       7.45        13.2       0.000
ST5                  OUTFALL    296.76   296.76     1  22:00       5.58        5.58       0.000
SU1                  STORAGE    344.10   344.10     1  22:00       5.93        5.93       0.000


  **********************
  Node Surcharge Summary
  **********************

  Surcharging occurs when water rises above the top of the highest conduit.
  ------------------------------------------------------------------------
                                           Max. Height   Min. Depth
                                Hours      Above Crown    Below Rim
  Node                 Type  Surcharged        Meters       Meters
  ------------------------------------------------------------------------
  J1                   JUNCTION    1.04         0.064        0.391


  **********************
  Node Flooding Summary
  **********************

  No nodes were flooded.


  **********************
  Storage Volume Summary
  **********************

  ---------------------------------------------------------------------------------------------------------
                                Average    Avg   Evap  Exfil      Maximum    Max    Time of Max    Maximum
                                 Volume   Pcnt   Pcnt   Pcnt       Volume   Pcnt     Occurrence    Outflow
  Storage Unit                1000 m³   Full   Loss   Loss     1000 m³   Full     days hr:min        LPS
  ---------------------------------------------------------------------------------------------------------
  SU1                           0.065    6.4    0.0    0.0        0.345   33.9       1  22:12     294.29


  ************************
  Outfall Loading Summary
  ************************

  ------------------------------------------------------------
                                Flow       Avg       Max       Total
                                Freq      Flow      Flow      Volume
  Outfall Node                  Pcnt       LPS       LPS    10^6 ltr
  ------------------------------------------------------------
  OF_Rear-yard                 99.97     16.29    113.20       1.932
  ST3_Low                      99.90    111.93    688.50      13.184
  ST5                          99.89     47.00    296.76       5.581
  ------------------------------------------------------------
  System                       99.92    175.22   1098.46      20.698


  ********************
  Link Flow Summary
  ********************

  ---------------------------------------------------------------------------------
                                Maximum  Time of Max   Maximum    Max/    Max/
                                 |Flow|   Occurrence   |Veloc|    Full    Full
  Link                 Type        LPS  days hr:min     m/sec    Flow   Depth
  ---------------------------------------------------------------------------------
  2                    CONDUIT  281.35     1  22:03      4.55    0.53    1.00
```

4	CONDUIT	293.95	1	22:09	2.67	3.09	1.00
1	ORIFICE	67.03	1	16:48			1.00

****
Flow Classification Summary
****

	Adjusted	Fraction of Time in Flow Class							
	/Actual		Up	Down	Sub	Sup	Up	Down	Norm	Inlet
Conduit	Length	Dry	Dry	Dry	Crit	Crit	Crit	Crit	Ltd	Ctrl
2	1.00	0.85	0.00	0.00	0.01	0.02	0.00	0.12	0.00	0.00
4	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00

****
Conduit Surcharge Summary
****

	Hours Full			Hours Above Full	Hours Capacity
Conduit	Both Ends	Upstream	Dnstream	Normal Flow	Limited
2	0.01	0.01	1.04	0.01	0.01
4	0.02	3.03	0.02	5.26	0.02

Analysis begun on: Fri Jul 18 09:46:55 2025
Analysis ended on: Fri Jul 18 09:46:55 2025
Total elapsed time: < 1 sec

PREPARED FOR:

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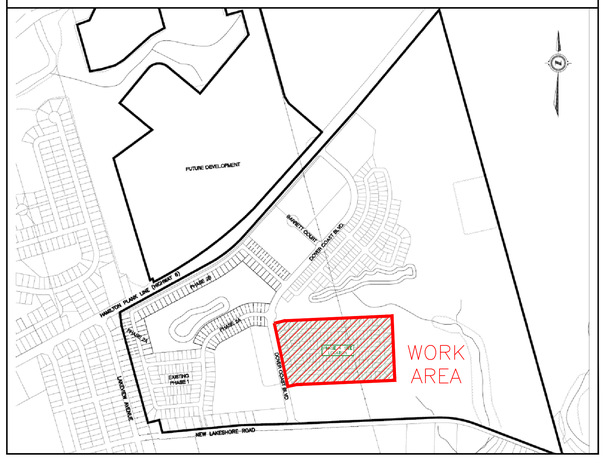
deveng.net

DOVER COAST DEVELOPMENTS
PHASE 4
STREETLIGHT DESIGN

KEY MAP (N.T.S.)

PORT DOVER



PREPARED BY:

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GENERAL NOTES

1. GENERAL CONDITIONS

1.1 ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH INSTALLATION GUIDELINES FOR DEVELOPMENTS AND ANY OTHER LOCAL REGULATIONS HAVING JURISDICTION OVER THE WORK OR TRADE.
1.2 BEFORE TENDERING, THE SITE AND ALL DRAWINGS AND SPECIFICATIONS OF ALL TRADES SHALL BE EXAMINED. FAILURE TO DO SO WILL ALLOW FOR NO EXTRAS.
1.3 ALL ELECTRICAL WORK SHALL COMPLY WITH ESA ELECTRICAL BULLETINS APPLICABLE AT TENDER CLOSE. WHERE SPECIFIC BULLETINS ARE NOT NAMED THEY ARE STILL CONSIDERED AN INTEGRAL PART OF THE SPECIFICATIONS HEREIN.
1.4 ALL GROUNDING SHALL BE IN ACCORDANCE WITH ONTARIO ELECTRICAL SAFETY CODE REQUIREMENTS AND MUST BE PROVIDED, IRRESPECTIVE OF SPECIFIC INCLUSION WITHIN DRAWING.
1.5 ALL MATERIALS PROVIDED SHALL BE CSA-APPROVED. ALL WORKMANSHIP SHALL BE FIRST-CLASS IN REGARD TO STANDARD PRACTICES, SAFETY, ACCESSIBILITY, DURABILITY, AND NEATNESS, FOR ACCEPTANCE BY THE OWNERS' REPRESENTATIVES.
1.6 ALL PERMITS, INSPECTIONS, AND CONNECTION FEES REQUIRED FOR THE WORK OF THIS TRADE SHALL BE ACQUIRED AND PAID IN ADVANCE. ALL DRAWINGS REQUIRED FOR PERMITS, FEES, APPROVALS, EXAMINATIONS, AND SERVICES SHALL BE SUBMITTED TO THE SUPPLY AUTHORITY.
1.7 ALL CUTTING AND PATCHING REQUIRED FOR THE WORK OF THIS TRADE SHALL BE PROVIDED. ALL SHOP-PAINTED EQUIPMENT DAMAGED IN TRANSIT MUST BE TOUCHED-UP TO MATCH EXISTING FINISH.
1.8 ACCUMULATION OF DEBRIS ON THE WORK SITE MUST BE AVOIDED. ON COMPLETION OF CONSTRUCTION AND PRIOR TO THE FINAL INSPECTION AND ACCEPTANCE BY THE OWNER, ALL SCRAP MATERIALS ON SITE RESULTING FROM THE WORK OF THIS TRADE MUST BE REMOVED.
1.9 WORK OF THIS TRADE SHALL BE COORDINATED WITH THE WORK OF ALL OTHER TRADES ON THE JOB SO THAT WORK MAY PROGRESS WITHOUT DELAY.
1.10 UPON COMPLETION OF THE WORK, THE FINAL UNCONDITIONAL CERTIFICATE OF ACCEPTANCE FROM THE LOCAL UTILITY SHALL BE PROVIDED.
1.11 A ONE-YEAR GUARANTEE ON ALL MATERIALS AND LABOUR FROM THE DATE OF ACCEPTANCE BY THE OWNER SHALL BE PROVIDED.
1.12 SHOP DRAWINGS FOR STREET LIGHTING POLES, LUMINAIRES, AND STREET LIGHT POWER PEDESTALS SHALL BE PROVIDED.
1.13 SHOP DRAWINGS SHALL CONTAIN ALL INFORMATION RELEVANT TO EQUIPMENT THEREIN, AND MUST BEAR THE NAME OF THE MANUFACTURER, THE MANUFACTURER'S CATALOGUE NUMBER, AND THE CONSULTANT'S DESIGNATION.
1.14 ALL EQUIPMENT SHALL BE MOUNTED PLUMBED TRUE.
1.15 OBTAIN ONE SET OF BLUEPRINTS FOR AS-BUILT PURPOSES AND RECORD ON THESE PRINTS ALL CHANGES TO THE DRAWINGS, REFLECTING ACTUAL CONSTRUCTION CONDITIONS, FINAL EQUIPMENT LOCATIONS, AND EQUIPMENT SPECIFICATIONS. FOLLOWING THE COMPLETION OF CONSTRUCTION BUT PRIOR TO FINAL INSPECTION BY THE CONSULTANT, SUBMIT THE AS-BUILT DRAWINGS FOR REVIEW. NO FINAL INSPECTION WILL BE PERFORMED UNTIL THESE DRAWINGS ARE SUBMITTED.
1.16 THE WORD "PROVIDE" AS USED IN THESE SPECIFICATIONS AND DRAWINGS, IS DEFINED AS "PROVIDE & INSTALL COMPLETE WITH ALL ASSOCIATED MOUNTING HARDWARE AND CONNECTIONS."

2. CONDUCTORS AND RACEWAYS

2.1 USE CSA-APPROVED CONDUCTORS FOR ALL APPLICATIONS. USE TYPES/SIZES INDICATED ON DRAWINGS.
2.2 ALL CONDUCTORS ARE TO BE INSTALLED IN RACEWAYS AS DESCRIBED ON THE DRAWINGS AND IN ACCORDANCE WITH THE AESC 26TH EDITION CODE BOOK.

3. STREET LIGHTING

3.1 PROVIDE POLE LIGHTS TO THE TOWNSHIP OF ZORRA REQUIREMENTS. OPERATING VOLTAGE IS 120V. EXACT LAMP TYPE AND WATTAGE TO BE CONFIRMED WITH THE TOWNSHIP OF ZORRA PRIOR TO CONSTRUCTION.
3.2 PROVIDE ELECTRICAL SERVICE REQUIREMENTS AND GROUNDING TO AESC REGULATIONS FOR STREET LIGHTING CIRCUITS.
3.3 PROVIDE ALL TERMINATIONS FOR THE STREET LIGHT POLES IN INDIVIDUAL POLE HAND HOLES.
3.4 ROAD CROSSING LAYOUT AS PER TOWNSHIP OF ZORRA DESIGN SPECIFICATION. STREET LIGHT POLES TO BE INSTALLED AS PER ROAD CROSS-SECTION.
3.5 LOCATE ALL STORM DRAINS PRIOR TO INSTALLATION OF STREET LIGHT POLES AND FIXTURES. IF CONFLICT DETECTED, RELOCATE STREET LIGHT POLE ON EITHER SIDE OF STORM DRAIN BY ONE METRE.

DRAWING SCHEDULE	
DRAWING NO.	DRAWING DESCRIPTION
G-001	COVER PAGE & DRAWING INDEX
E-100	PRELIMINARY STREETLIGHT LAYOUT
E-101	PRELIMINARY STREETLIGHT ANALYSIS
E-500	SPEC SHEETS
E-501	SPEC SHEETS

NO.	DATE	REVISION	BY
4			
3			
2	2025-10-16	ISSUED FOR FIRST SUBMISSION	KL
1	2025-09-05	UPDATED WITH REVISED BASEPLAN DWG	KL
0	2025-08-19	ISSUED FOR CLIENT REVIEW	KL

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DESCRIPTION: COVER PAGE & DRAWING INDEX

PROJECT NAME: DOVER COAST DEVELOPMENTS PHASE 4 STREETLIGHT DESIGN

CITY/TOWN: PORT DOVER

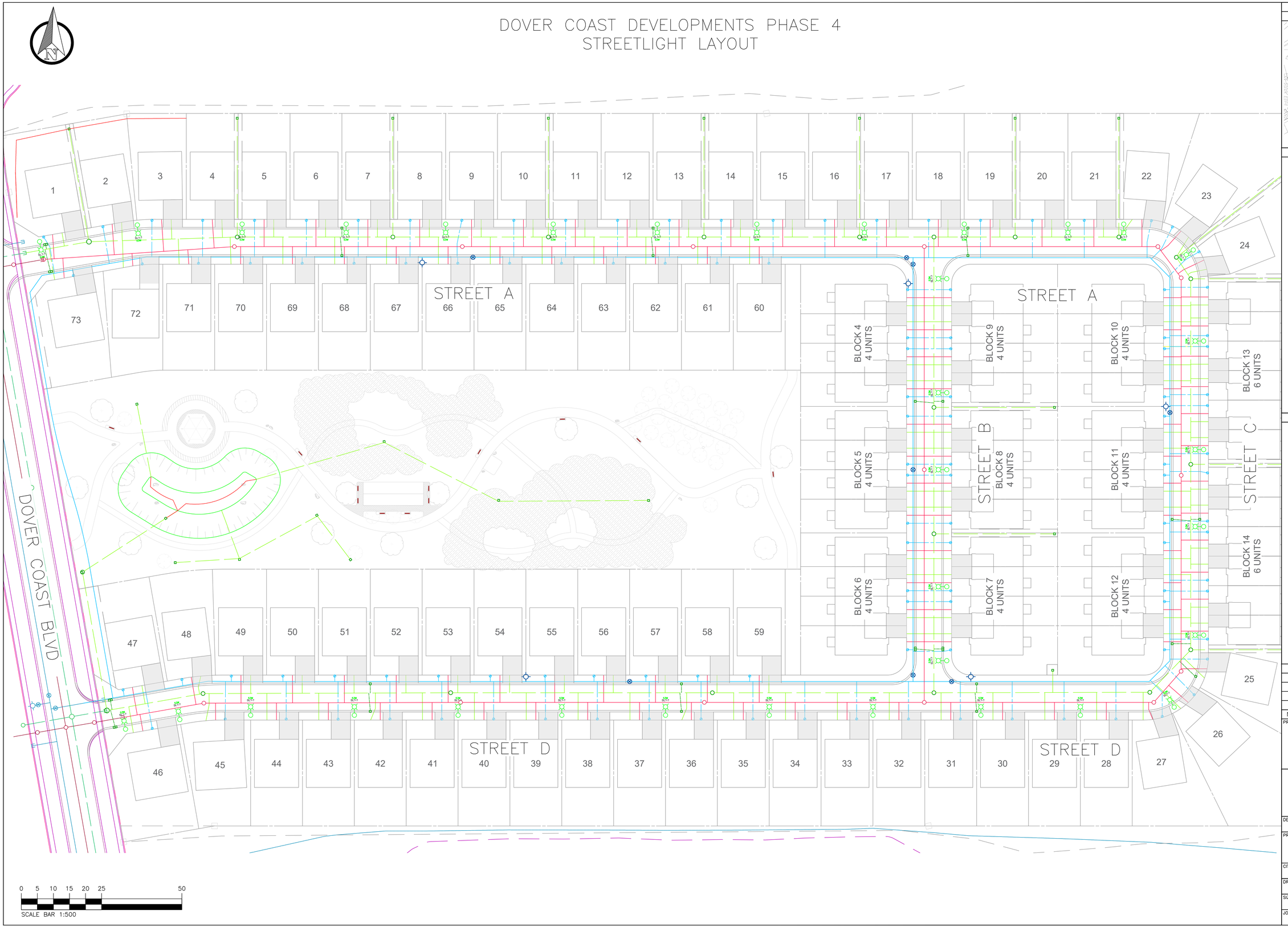
DRAFTER	CHECKED BY	DATE
K.LAPIER	D.SHEPHERD	2025-09-05

SIZE	SCALE	PAGE
ARCH D	N.T.S.	1 OF 5

JOB NO.	DRAWING NO.
H-25-009	G-100

E:\erth holdings\infrastructure\jobs\2025\H-25-009 - bdsinfy - dover coast - ll design - 2025-10-16\dwg\design\streetlight design - bdsinfy - dovercoast - 2025-09-05.dwg

DOVER COAST DEVELOPMENTS PHASE 4
STREETLIGHT LAYOUT

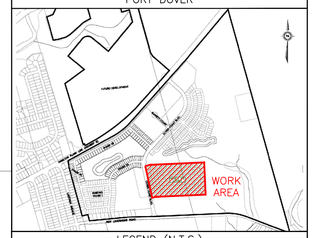


0 5 10 15 20 25 50

SCALE BAR 1:500

KEY MAP (N.T.S.)

PORT DOVER



LEGEND (N.T.S.)

- STREET LIGHT CONDUCTOR (EXISTING)
- STREET LIGHT CONDUCTOR (PROPOSED)
- SECONDARY FEED (PROPOSED)
- STREET LIGHT (EXISTING)
- STREET LIGHT (PROPOSED)
- JUNCTION BOX (EXISTING)
- JUNCTION BOX (PROPOSED)
- TRANSFORMER (EXISTING)
- TRANSFORMER (NEW)
- STREET LIGHT PEDESTAL/DISCONNECT (EXISTING)
- STREET LIGHT PEDESTAL/DISCONNECT (PROPOSED)

CONSTRUCTION NOTES

NO.	DATE	REVISION	BY
4			
3			
2	2025-10-16	ISSUED FOR FIRST SUBMISSION	KL
1	2025-09-05	UPDATED WITH REVISED BASEPLAN DWG	KL
0	2025-08-19	ISSUED FOR CLIENT REVIEW	KL

PREPARED FOR

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DESCRIPTION
PRELIMINARY STREETLIGHT LAYOUT

PROJECT NAME
DOVER COAST DEVELOPMENTS PHASE 4
STREETLIGHT DESIGN

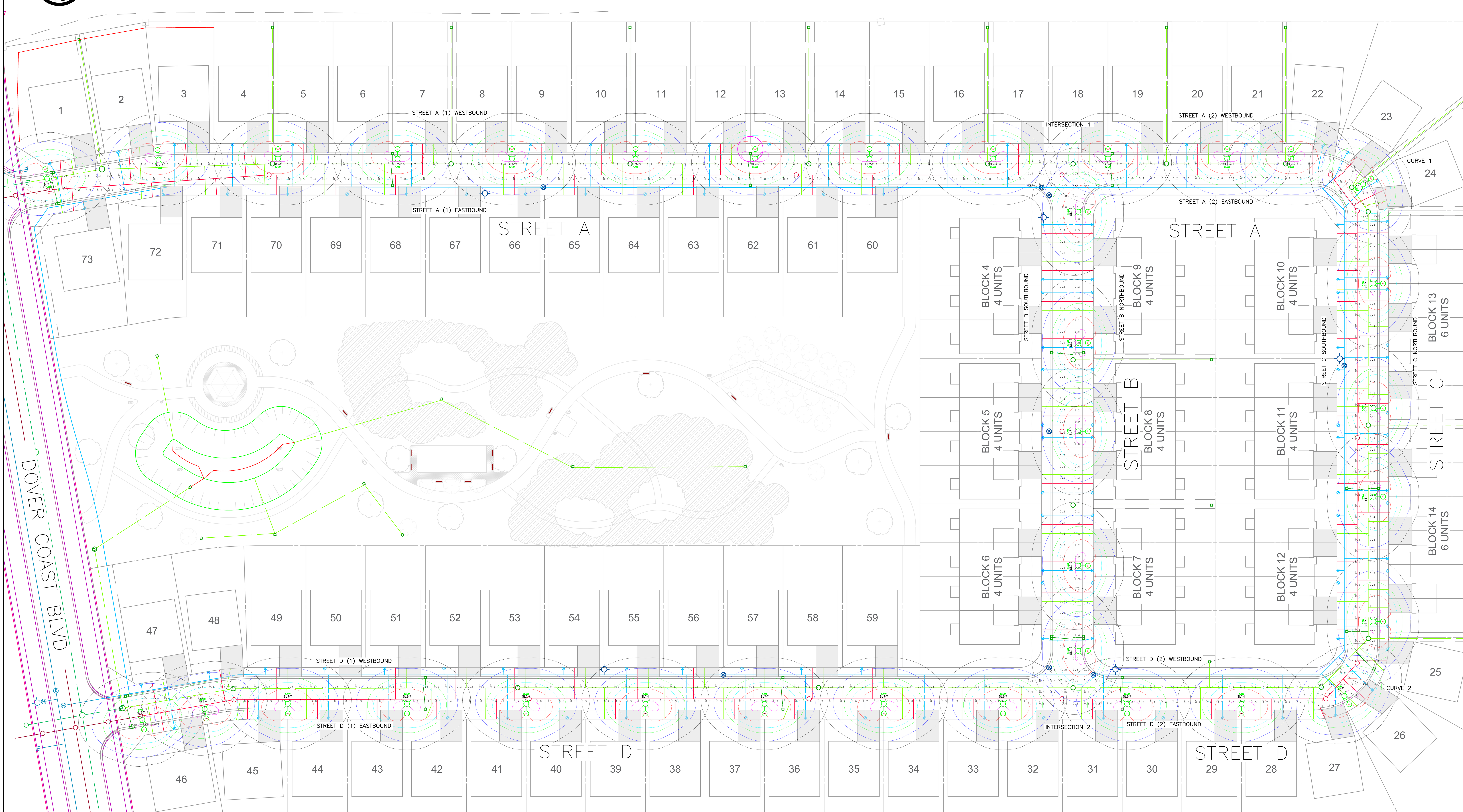
CITY/TOWN
PORT DOVER

DRAFTER	CHECKED BY	DATE
K.LAPIER	D.SHEPHERD	2025-09-05

SIZE	SCALE	PAGE
ARCH D	1:1000	2 OF 5

JOB NO.	DRAWING NO.
H-25-009	E-100

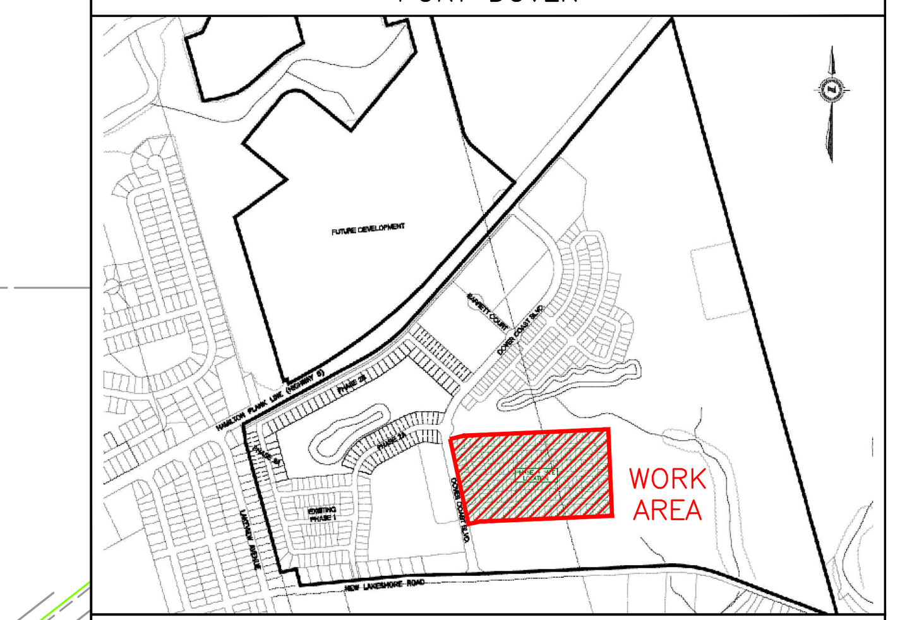
DOVER COAST DEVELOPMENTS PHASE 4
STREETLIGHT ANALYSIS



STREET A (1) WESTBOUND
STREET A (1) EASTBOUND
STREET A
STREET A (2) WESTBOUND
STREET A (2) EASTBOUND
INTERSECTION 1
CURVE 1
STREET B SOUTHBOUND
STREET B NORTHBOUND
STREET B
STREET C SOUTHBOUND
STREET C NORTHBOUND
STREET C
STREET D (1) WESTBOUND
STREET D (1) EASTBOUND
STREET D
STREET D (2) WESTBOUND
STREET D (2) EASTBOUND
INTERSECTION 2
CURVE 2
DOVER COAST BLVD
BLOCK 4 4 UNITS
BLOCK 5 4 UNITS
BLOCK 6 4 UNITS
BLOCK 7 4 UNITS
BLOCK 8 4 UNITS
BLOCK 9 4 UNITS
BLOCK 10 4 UNITS
BLOCK 11 4 UNITS
BLOCK 12 4 UNITS
BLOCK 13 6 UNITS
BLOCK 14 6 UNITS

KEY MAP (N.T.S.)

PORT DOVER



LEGEND (N.T.S.)

- STREET LIGHT CONDUCTOR (EXISTING)
- STREET LIGHT CONDUCTOR (PROPOSED)
- SECONDARY FEED (PROPOSED)
- SL1-1 STREET LIGHT (EXISTING)
- SL1-1 72W STREET LIGHT (PROPOSED)
- JB JUNCTION BOX (EXISTING)
- JB JUNCTION BOX (PROPOSED)
- TRANSFORMER (EXISTING)
- TRANSFORMER (NEW)
- PED STREET LIGHT PEDESTAL/DISCONNECT (EXISTING)
- PED STREET LIGHT PEDESTAL/DISCONNECT (PROPOSED)

STREETLIGHT ANALYSIS LEGEND (N.T.S.)

- ISOLINE VALUE 0.1 Fc
- ISOLINE VALUE 0.2 Fc
- ISOLINE VALUE 0.4 Fc
- ISOLINE VALUE 0.6 Fc
- ISOLINE VALUE 1.0 Fc
- ISOLINE VALUE 2.0 Fc

STREETLIGHT ANALYSIS RESULTS

Curve 1
Illuminance (Fc)
Average=1.02 Maximum=2.1 Minimum=0.4
Avg/Min=2.55 Max/Min=5.25

Curve 2
Illuminance (Fc)
Average=1.01 Maximum=2.3 Minimum=0.5
Avg/Min=2.02 Max/Min=4.60

Intersection 1
Illuminance (Fc)
Average=0.91 Maximum=2.1 Minimum=0.3
Avg/Min=3.03 Max/Min=7.00

Intersection 2
Illuminance (Fc)
Average=0.78 Maximum=2.0 Minimum=0.4
Avg/Min=1.95 Max/Min=5.00

STREETLIGHT ANALYSIS RESULTS CONTINUED

Street A (2) Eastbound
Illuminance (Fc)
Average=0.62 Maximum=0.9 Minimum=0.2
Avg/Min=3.10 Max/Min=4.50

Street A (2) Westbound
Illuminance (Fc)
Average=1.32 Maximum=2.2 Minimum=0.3
Avg/Min=4.40 Max/Min=7.33

Street A Eastbound
Illuminance (Fc)
Average=0.47 Maximum=1.3 Minimum=0.2
Avg/Min=2.35 Max/Min=6.50

Street A Westbound
Illuminance (Fc)
Average=0.99 Maximum=2.1 Minimum=0.2
Avg/Min=4.95 Max/Min=10.50

STREETLIGHT ANALYSIS RESULTS CONTINUED

Street B Northbound
Illuminance (Fc)
Average=1.06 Maximum=2.1 Minimum=0.2
Avg/Min=5.30 Max/Min=10.50

Street B Southbound
Illuminance (Fc)
Average=0.51 Maximum=0.9 Minimum=0.2
Avg/Min=2.55 Max/Min=4.50

Street C Northbound
Illuminance (Fc)
Average=1.06 Maximum=2.0 Minimum=0.2
Avg/Min=5.30 Max/Min=10.00

Street C Southbound
Illuminance (Fc)
Average=0.51 Maximum=0.8 Minimum=0.2
Avg/Min=2.55 Max/Min=4.00

STREETLIGHT ANALYSIS RESULTS

Street D (1) Eastbound
Illuminance (Fc)
Average=1.10 Maximum=2.3 Minimum=0.3
Avg/Min=3.67 Max/Min=7.67

Street D (1) Westbound
Illuminance (Fc)
Average=0.51 Maximum=1.3 Minimum=0.2
Avg/Min=2.55 Max/Min=6.50

Street D (2) Eastbound
Illuminance (Fc)
Average=1.06 Maximum=2.0 Minimum=0.3
Avg/Min=3.53 Max/Min=6.67

Street D (2) Westbound
Illuminance (Fc)
Average=0.51 Maximum=0.8 Minimum=0.2
Avg/Min=2.55 Max/Min=4.00

LUMINAIRE SCHEDULE

QTY	LABEL	DESCRIPTION
34	URBAN TOWNVIEW TVPC	TVPC-L4-S-32-G1-5-3W-730-A

NOTES:
1. 15 FOOT USI CONCRETE POLE. MADISON SERIES MA-200-AL.
2. POST TOP MOUNTED LUMINAIRE.

NO.	DATE	REVISION	BY
4			
3			
2	2025-10-16	ISSUED FOR FIRST SUBMISSION	KL
1	2025-09-05	UPDATED WITH REVISED BASEPLAN DWG	KL
0	2025-08-19	ISSUED FOR CLIENT REVIEW	KL

PREPARED FOR
deveng
DEVELOPMENT ENGINEERING
41 ADELAIDE ST. N., UNIT 71
LONDON
ONTARIO, N6B 3P4
Ph: (519) 672-8310
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ERTH HOLDINGS INC.
180 WHITING STREET,
INGERSOLL
ONTARIO, N5C 3B5
Ph: (519) 485-6038
Fx: (519) 425-8456
www.erthcorp.com

DESCRIPTION: STREETLIGHT ANALYSIS

PROJECT NAME: DOVER COAST DEVELOPMENTS PHASE 4 STREETLIGHT DESIGN

CITY/TOWN: PORT DOVER

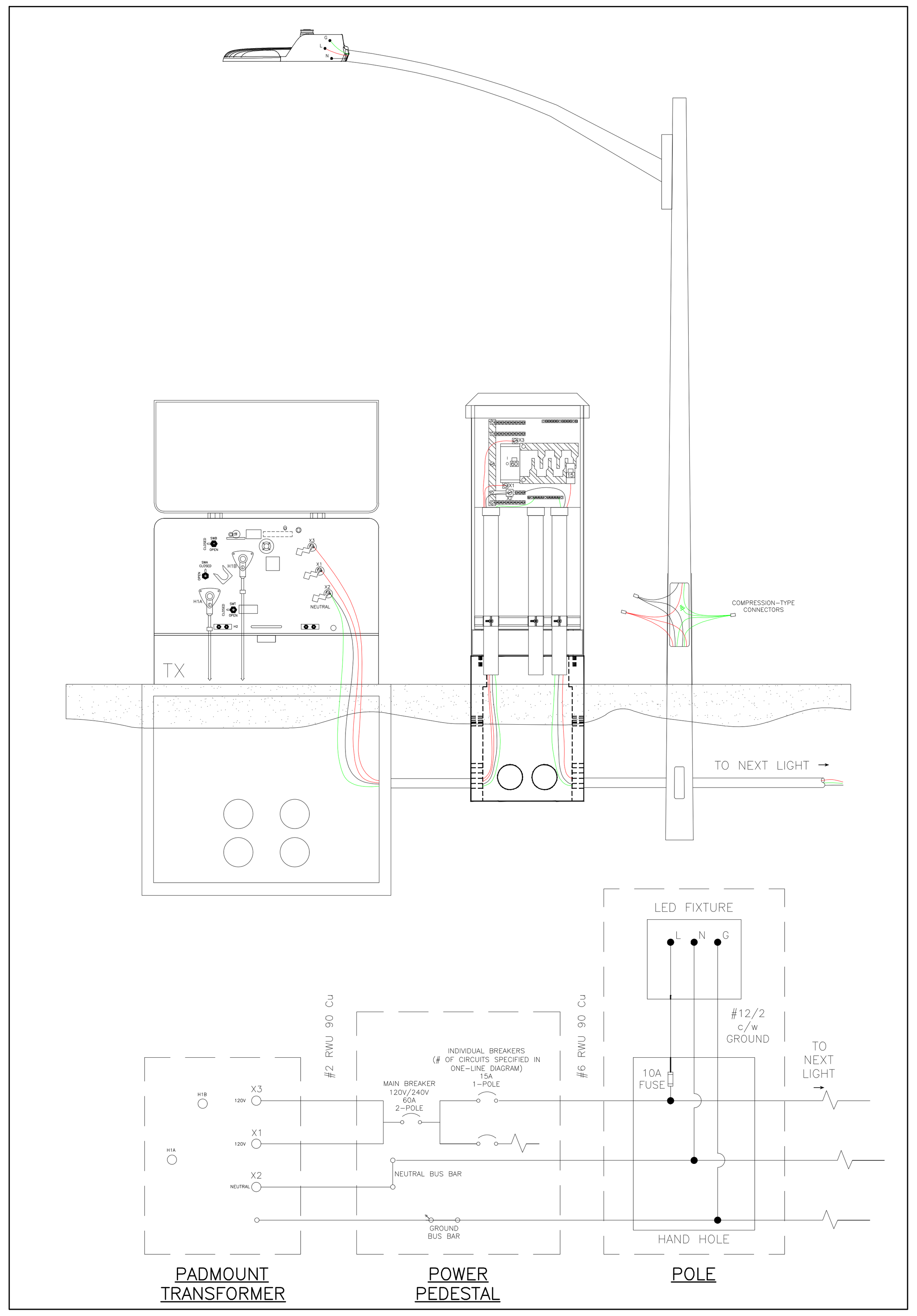
DRAFTER	CHECKED BY	DATE
K.LAPIER	D.SHEPHERD	2025-09-05
SIZE: ARCH D	SCALE: N.T.S.	PAGE: 3 OF 5
JOB NO.: H-25-009	DRAWING NO.: E-101	

z:\erth holdings\infrastructure\high voltage\job folders\2025\h-25-009 - balantry-dovercoast-street light design\3-drawings\h-25-009 - balantry - dover coast - sl design - 2025-10-16.dwg

SPEC SHEETS

DOVER COAST DEVELOPMENTS PHASE 4
ELECTRICAL ONE–LINE DIAGRAM

TBD

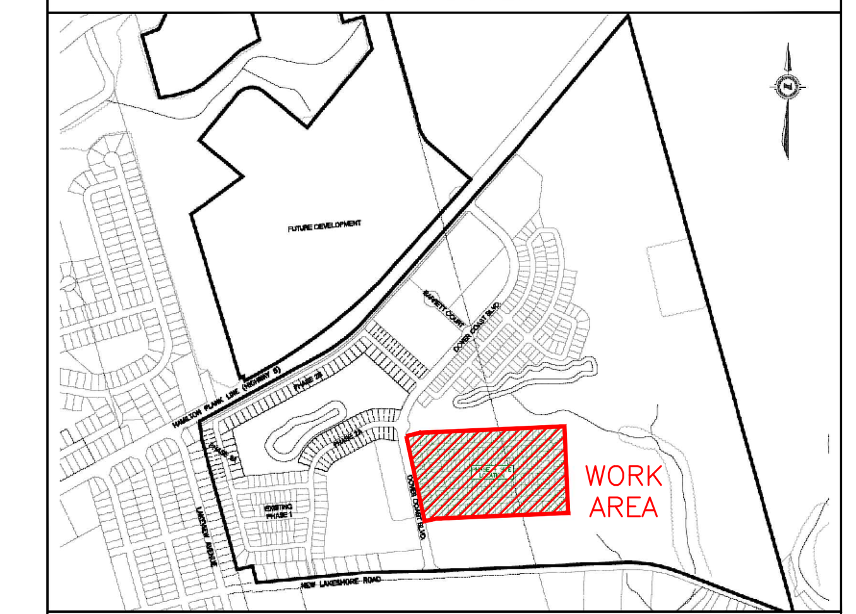


TX
COMPRESSION–TYPE CONNECTORS
TO NEXT LIGHT →
LED FIXTURE
L N G
#12/2 c/w GROUND
#2 RWU 90 Cu
#6 RWU 90 Cu
INDIVIDUAL BREAKERS (# OF CIRCUITS SPECIFIED IN ONE–LINE DIAGRAM) 15A 1–POLE
MAIN BREAKER 120V/240V 60A 2–POLE
10A FUSE
TO NEXT LIGHT
H1B
H1A
X3 120V
X1 120V
X2 NEUTRAL
NEUTRAL BUS BAR
GROUND BUS BAR
HAND HOLE
PADMOUNT TRANSFORMER
POWER PEDESTAL
POLE

POLE WIRING DETAIL

KEY MAP (N.T.S.)

PORT DOVER



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PREPARED FOR

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180 WHITING STREET,
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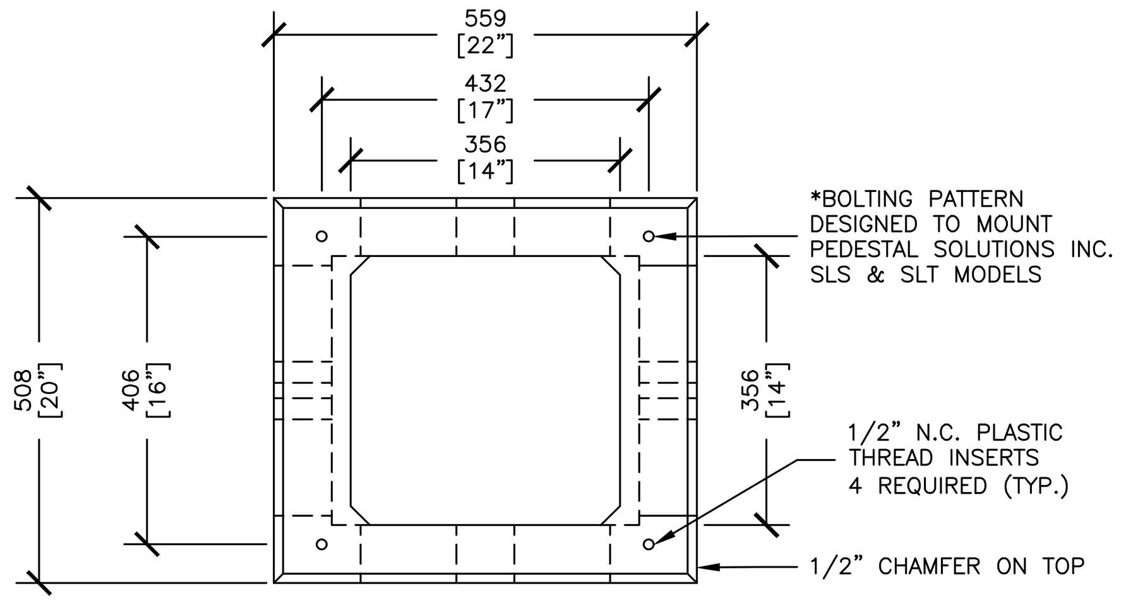
Ph: (519) 485–6038
Fx: (519) 425–8456
www.erthcorp.com

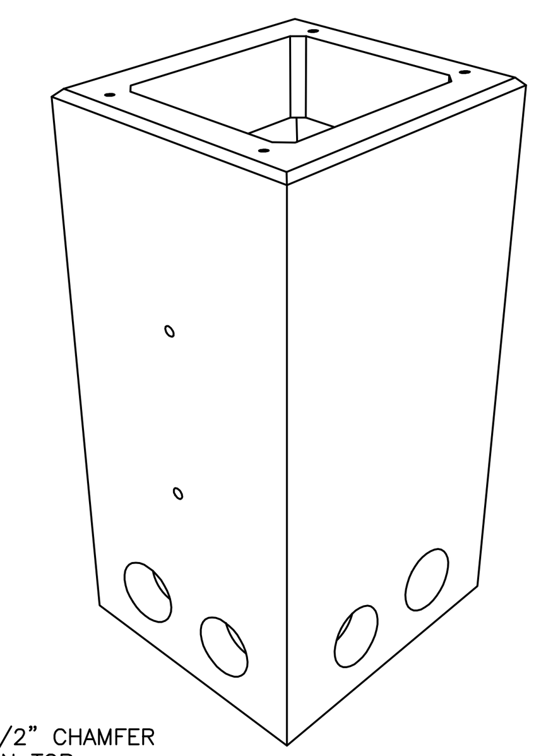
DESCRIPTION: SPEC SHEETS		
PROJECT NAME: DOVER COAST DEVELOPMENTS PHASE 4 STREETLIGHT DESIGN		
CITY/TOWN: PORT DOVER		
DRAFTER: K.LAPIER	CHECKED BY: D.SHEPHERD	DATE: 2025–09–05
SIZE: ARCH D	SCALE: N.T.S.	PAGE: 4 OF 5
JOB NO.: H–25–009	DRAWING NO.: E–500	

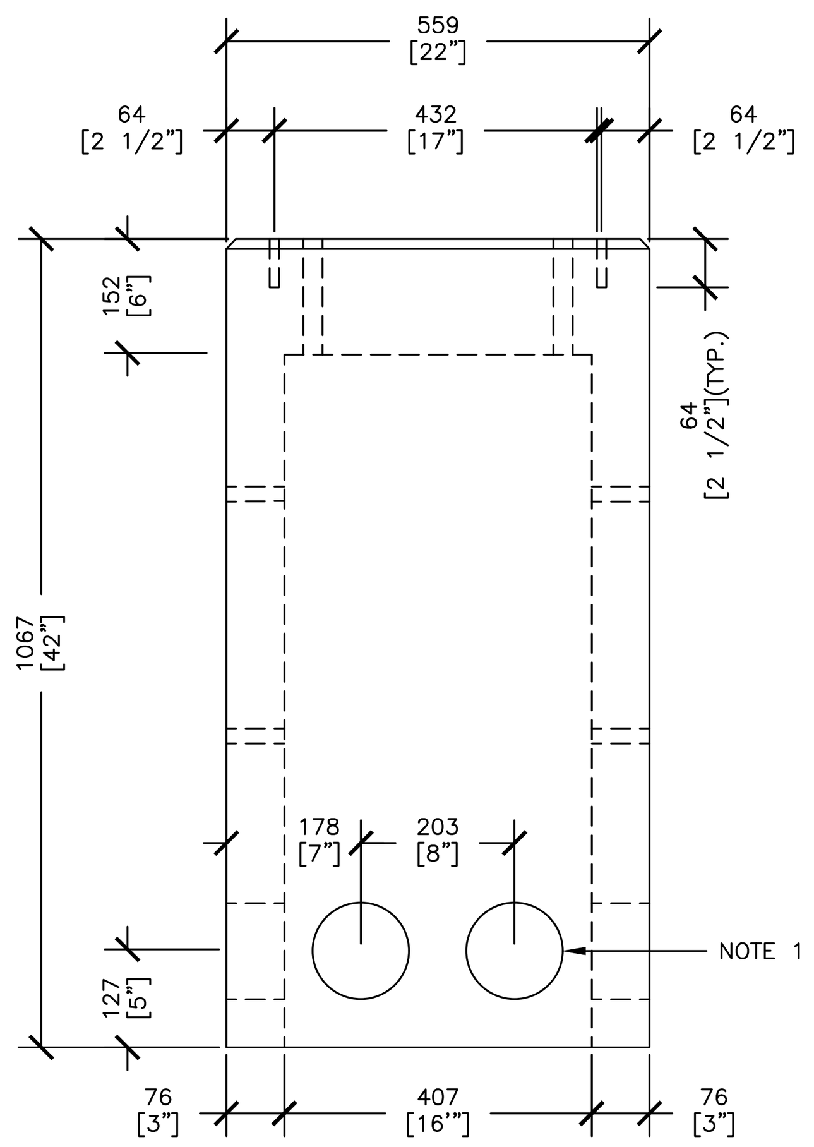
SPEC SHEETS

BROOKLIN CONCRETE PRODUCTS BCP22PED
FOUNDATION FOR METER OR STREET LIGHT PEDESTAL

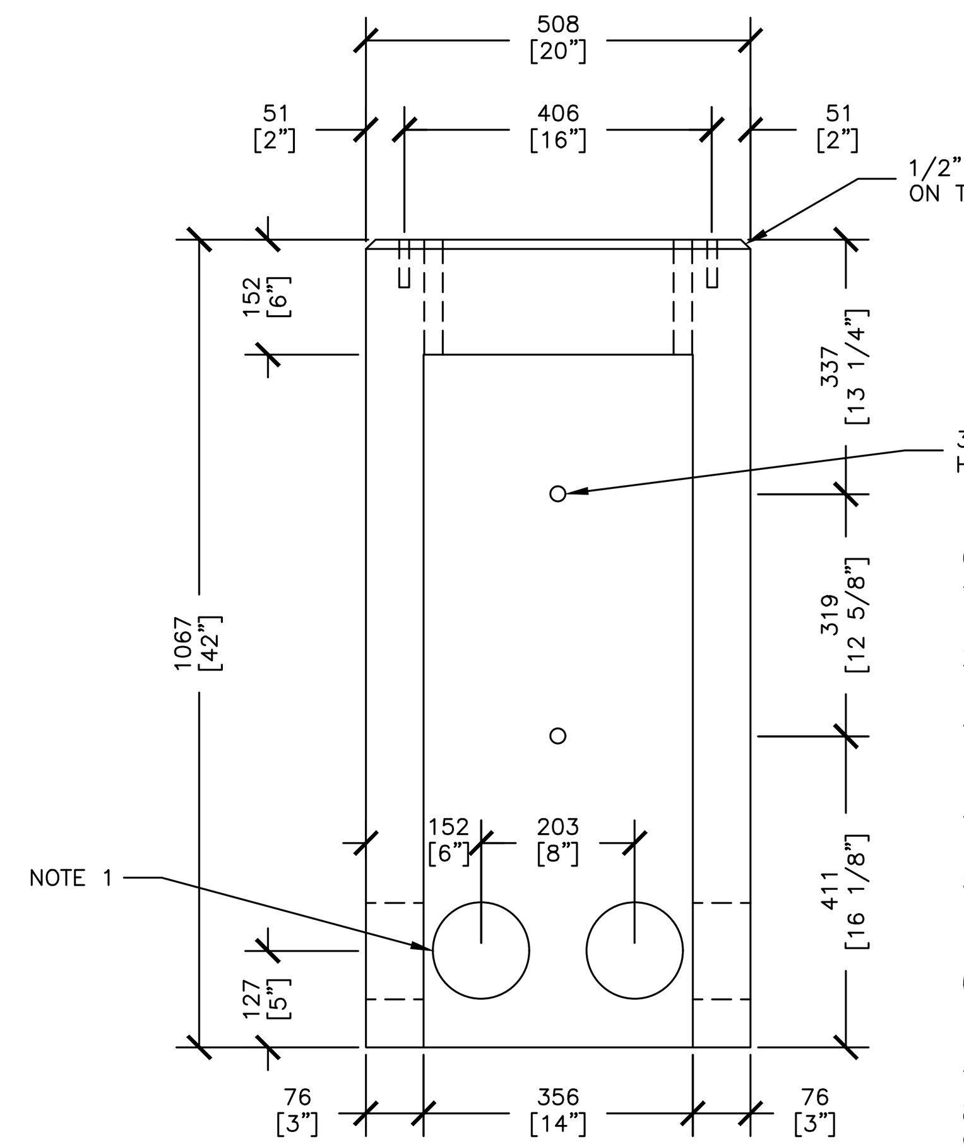


TOP VIEW





FRONT VIEW



RIGHT VIEW

GENERAL NOTES:
1. CABLE ENTRY OPENINGS – 4-3/4" PVC SEALS.
2. DELIVERY IS MADE BY CRANE-EQUIPPED TRUCKS.
3. EXCAVATION MUST BE READY, SAFE AND ACCESSIBLE FOR UNLOADING FROM THE REAR OF THE TRUCK.
4. MIN. OVERHEAD CLEARANCE OF 18FT (5.5 METRES) IS REQUIRED.
5. ALL UNITS MUST BE HANDLES WITH PROPER LIFTING EQUIPMENT (I.E. SPREADER BAR).
6. BOLTING PATTERN DESIGNED TO MOUNT PEDESTAL SOLUTIONS INC. SLS & SLT MODELS
7. CONCRETE: 35MPa / 5,000PSI
8. AIR ENTRAINMENT: 5–8%
9. REINFORCEMENT: STEEL TO CSA CAN A23.1 / A23.3. G30.18 Fy=400MPa
10. WEIGHT: 720lbs / 327kg

INFORMATION FROM BROOKLIN CONCRETE PRODUCTS SPEC SHEET BCP22PED
DATED JANUARY 2021
https://www.brooklin.com/products/utility-structures/

BILL OF MATERIALS

ITEM	UNITS	QUANTITY
BROOKLIN CONCRETE PEDESTAL BASE BCP22PED	ea	–
PSI SLM42 ENCLOSURE WITH METER AND LIGHTING CONTROL	ea	–
50mm RIGID PVC CONDUIT	ea	–
STREETLIGHT WIRE: 2x#6 AL CABLE + BOND WIRE	ea	–
PEDESTAL FEED: INSTALL 2x#2 AL CABLE + BOND WIRE	ea	–
	m	–
	m	–

THE MADISON SERIES

PHYSICAL DETAILS

- Octagonal tapered symmetrical cross section.
- Standard taper of 15mm/metre (0.18"/foot).
- Standard mold, etched, exposed or polished finishes are available in a variety of colours.
- Available in heights from 10 feet to 50 feet above grade.
- Will accept a variety of luminaire mounting styles.

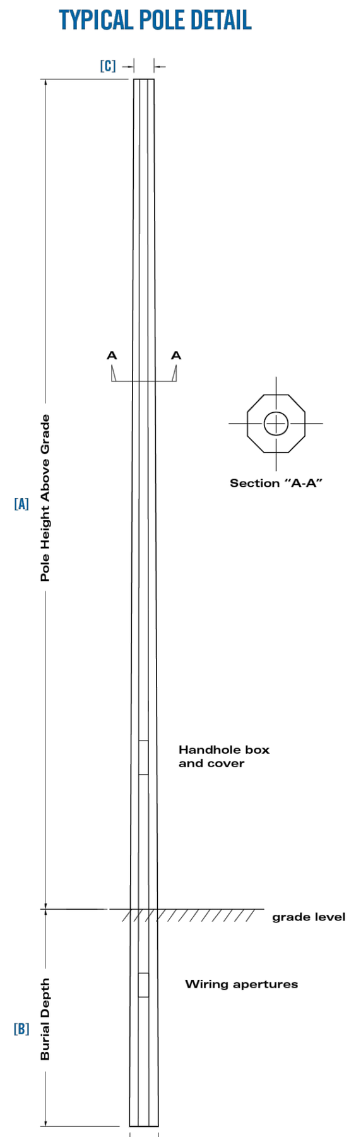
MADISON SPECIFYING CHART

CLASS OF POLE	SPECIFYING POLE CODE [Style-Height-Class]	[A] POLE HEIGHT ABOVE GRADE [ft.]	[B] DIRECT BURIAL LENGTH [ft.]	[C] POLE TIP DIMENSION [in.]	[D] POLE BUTT DIAMETER [in.]	ULTIMATE GROUND LINE MOMENT [ft.lbs.]	NOMINAL POLE WEIGHT [lbs.]
AL	MA-150-AL	11	4	4 3/4	7 7/16	5400	475
	MA-175-AL	13 1/2	4	4 3/4	7 7/8	6900	600
	MA-200-AL	15	5	4 3/4	8 3/8	7800	735
	MA-225-AL	17 1/2	5	4 3/4	8 13/16	9300	860
	MA-250-AL	20	5	4 3/4	9 1/4	10800	990
A	MA-150-A	11	4	4 3/4	7 7/16	5400	490
	MA-175-A	13 1/2	4	4 3/4	7 7/8	6900	615
	MA-200-A	15	5	4 3/4	8 3/8	7800	750
	MA-225-A	17 1/2	5	4 3/4	8 13/16	9300	875
	MA-250-A	20	5	4 3/4	9 1/4	10800	1005
	MA-275-A	22 1/2	5	4 3/4	9 7/8	12300	1165
	MA-300-A	25	5	4 3/4	10 1/8	13800	1325
	MA-325-A	27 1/2	5	4 3/4	10 5/8	15300	1495
	MA-350-A	30	5	4 3/4	11 1/16	16800	[illegible]
B	MA-250-B	20	5	5	9 1/2	16200	1040
	MA-275-B	22 1/2	5	5	10 [illegible]	18450	1210
	MA-300-B	25	5	5	10 [illegible]	[illegible]	1375
	MA-325-B	27 1/2	5	5	[illegible]	22950	1554
	MA-350-B	30	5	5	[illegible]	25200	1740
	MA-375-B	32 1/2	5	5	11 3/4	27450	1950
	MA-400-B	34	6	5	12 1/4	28800	2165
	MA-425-B	36 1/2	6	5	12 5/8	31050	2370
	MA-450-B	39	6	5	13 1/8	33300	2577
C	MA-300-C	25	5	6	11 3/8	27600	1730
	MA-325-C	27 1/2	5	6	11 7/8	30600	1970
	MA-350-C	30	5	6	12 5/16	33600	2205
	MA-375-C	32 1/2	5	6	12 3/4	36600	2440
	MA-400-C	34	6	6	13 3/16	38400	2675
D	MA-400-D	34	6	6	13 3/16	48000	2675
	MA-425-D	36 1/2	6	6	13 5/8	51750	2915
	MA-450-D	39	6	6	14 1/8	55500	3150
	MA-475-D	40 1/2	7	6	14 1/2	57750	3385
	MA-500-D	43	7	6	15	61500	3620

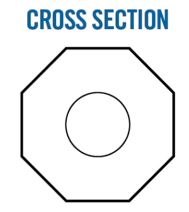
NOTES: This chart outlines typical heights and class of poles for this style. Other sizes are available upon request. The Madison series is available from 10 to 60 feet overall, in 6" increments. It's also available from class "AL" to class "E". Pole height above grade based on recommended burial depth for normal soils. Ultimate ground line moment is calculated as follows: Height above grade minus 2 ft. times transverse bending strength. Tip and butt dimensions are measured from flat to flat.

FINAL TBD

TYPICAL POLE DETAIL



CROSS SECTION



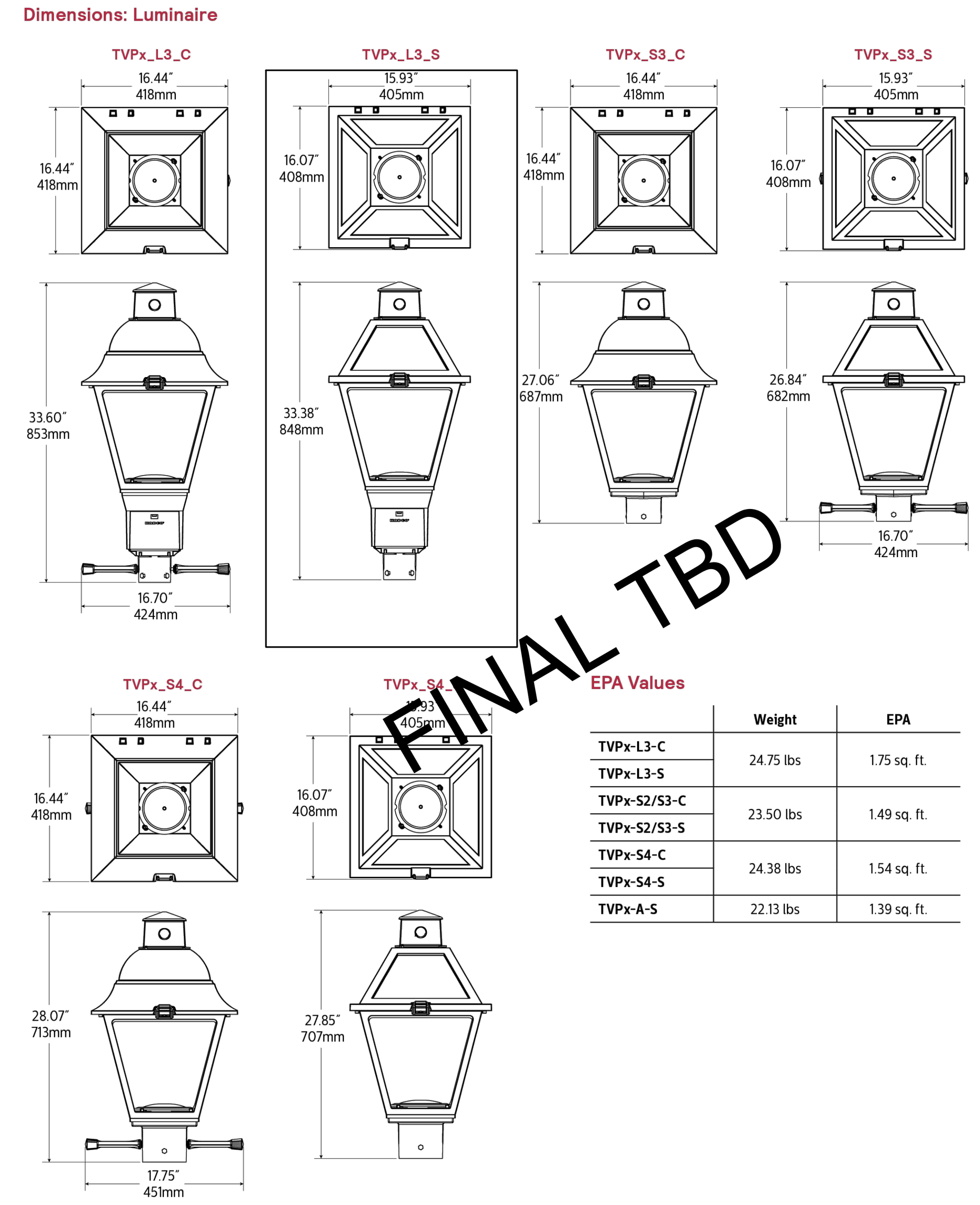
OCTAGONAL

61 BONGARD AVENUE, OTTAWA, ONTARIO CANADA K2E 6V2
TEL: [613] 225-6398 • FAX: [613] 225-1681 • TOLL FREE: 1-800-267-6466
www.utilitystructures.com

TVPC/TVPR TownView

Post top and arm mount luminaire

Dimensions: Luminaire

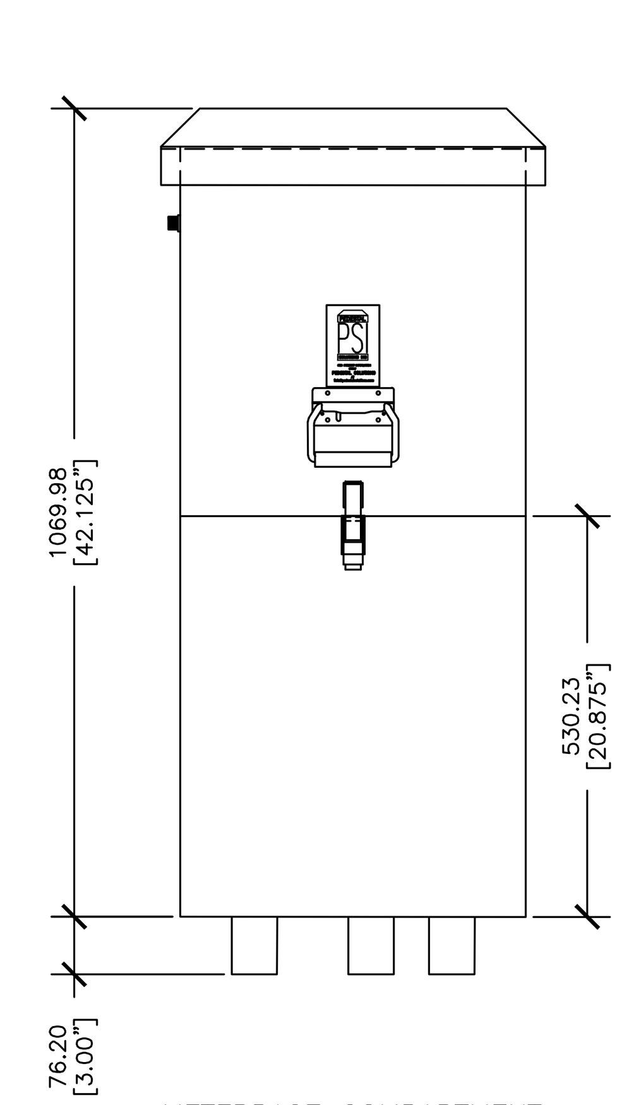


FINAL TBD

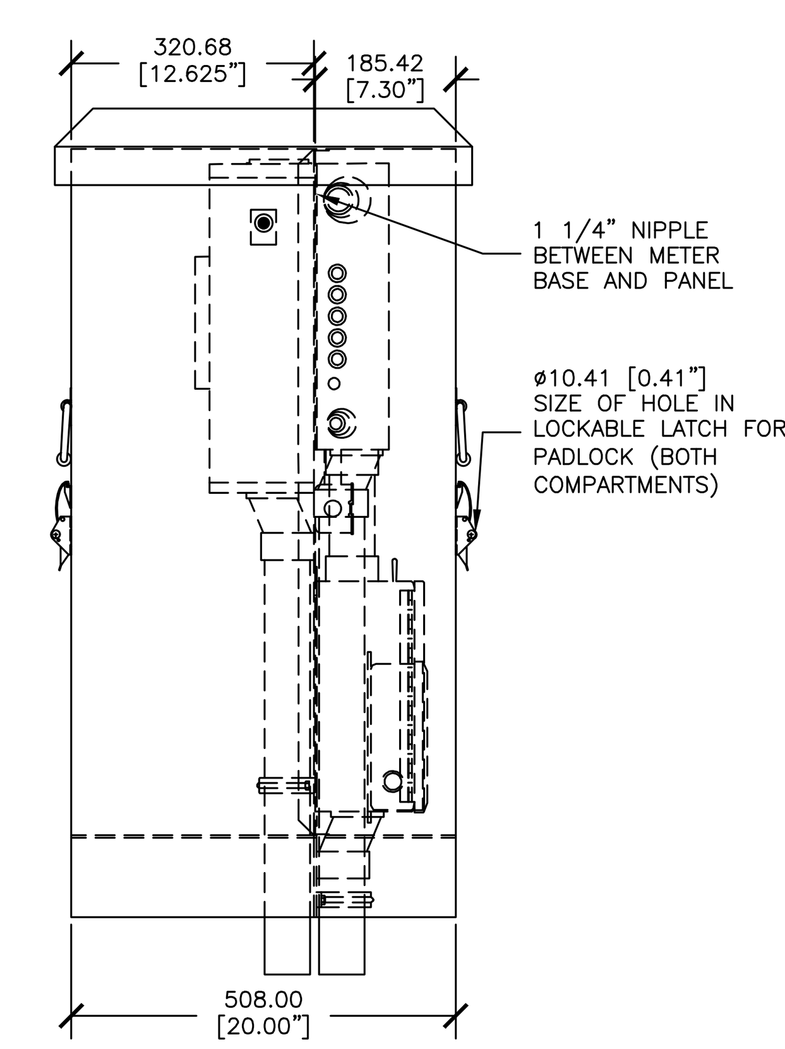
EPA Values

	Weight	EPA
TVPx-L3-C TVPx-L3-S	24.75 lbs	1.75 sq. ft.
TVPx-S2/S3-C TVPx-S2/S3-S	23.50 lbs	1.49 sq. ft.
TVPx-S4-C TVPx-S4-S	24.38 lbs	1.54 sq. ft.
TVPx-A-S	22.13 lbs	1.39 sq. ft.

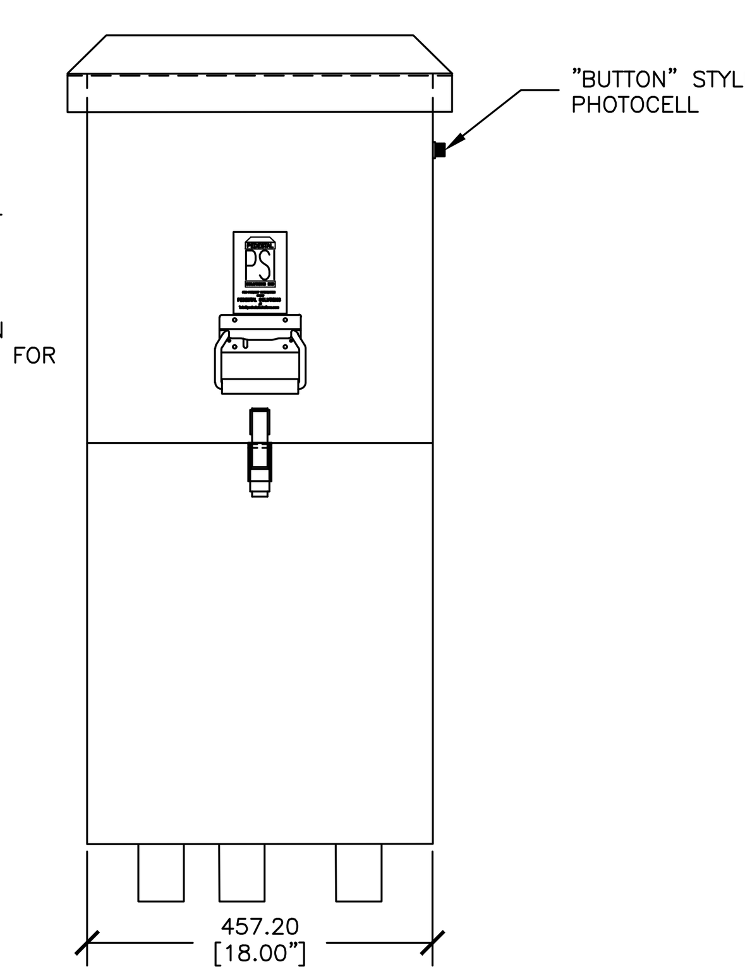
PEDESTAL SOLUTIONS INC.
SLM42 ENCLOSURE WITH METER AND LIGHTING CONTROL



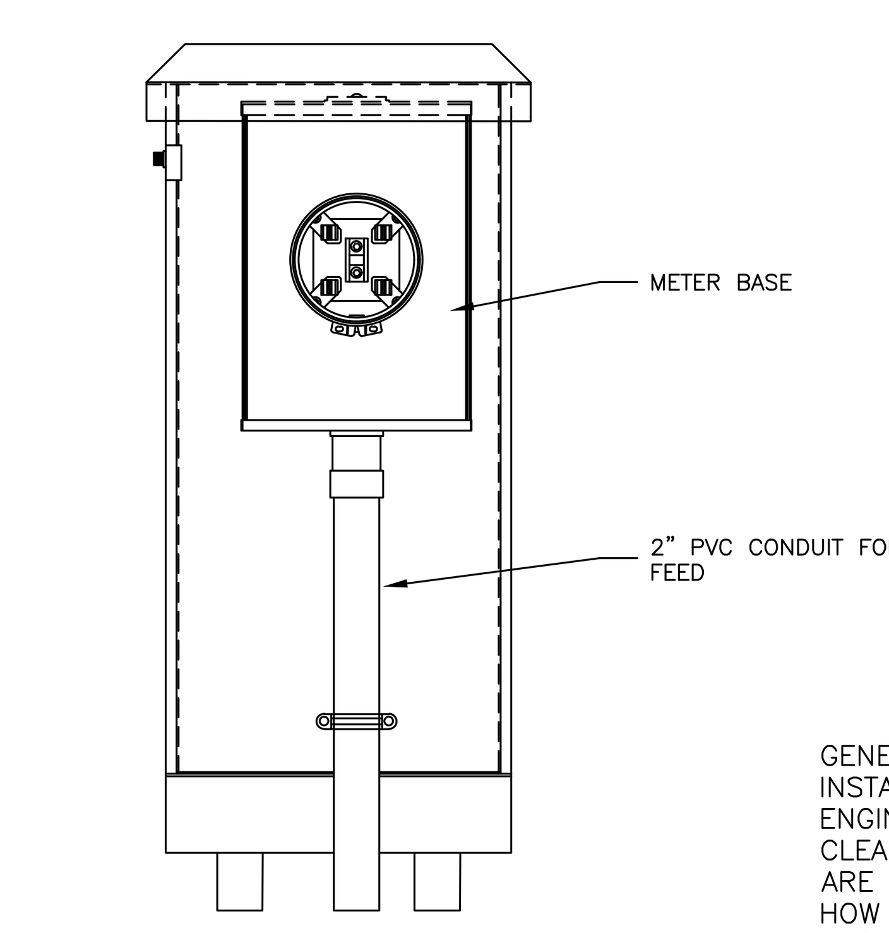
METERBASE COMPARTMENT OUTSIDE VIEW WITH DOOR PANELS IN PLACE



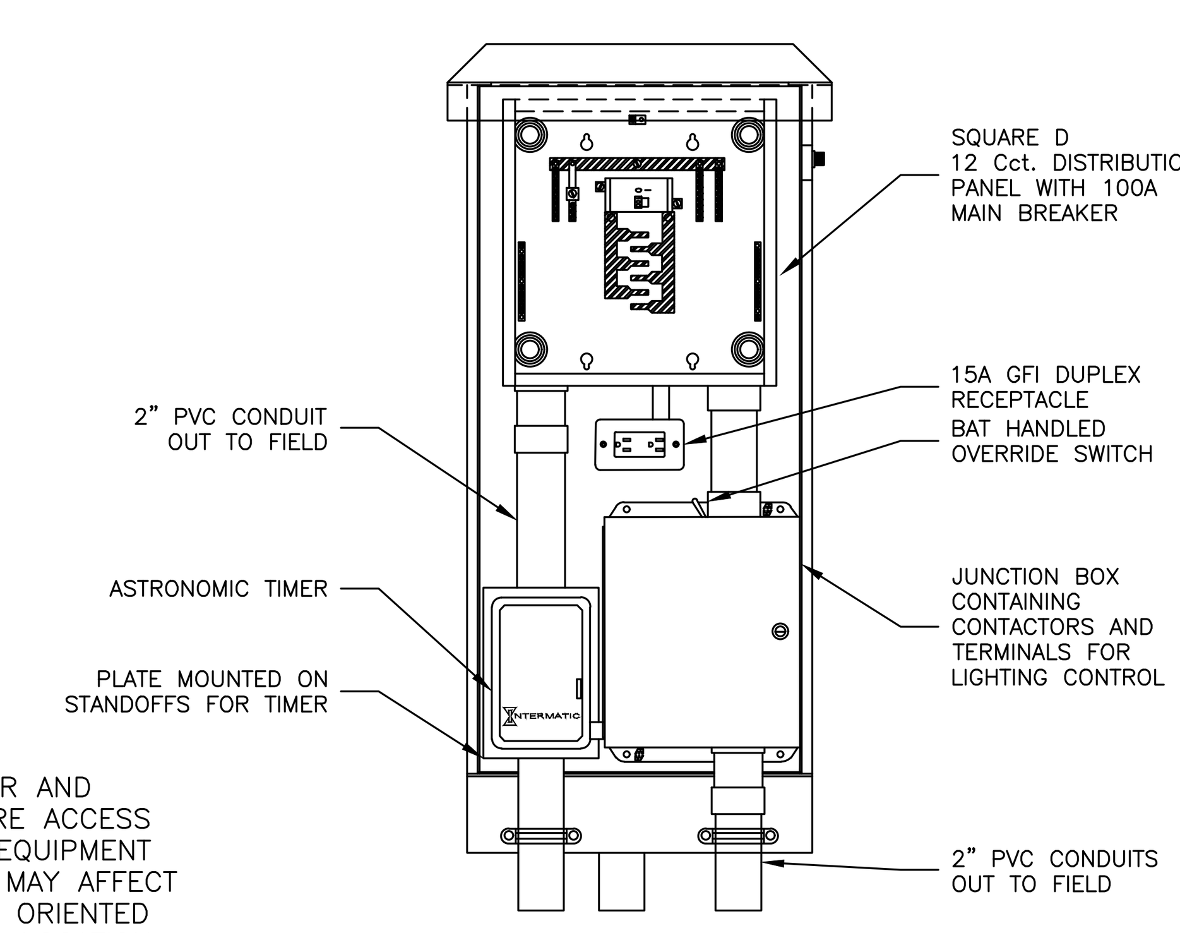
SIDE VIEW



DISTRIBUTION PANEL COMPARTMENT OUTSIDE VIEW WITH DOOR PANELS IN PLACE



METERBASE COMPARTMENT OUTSIDE VIEW WITH DOOR PANELS REMOVED



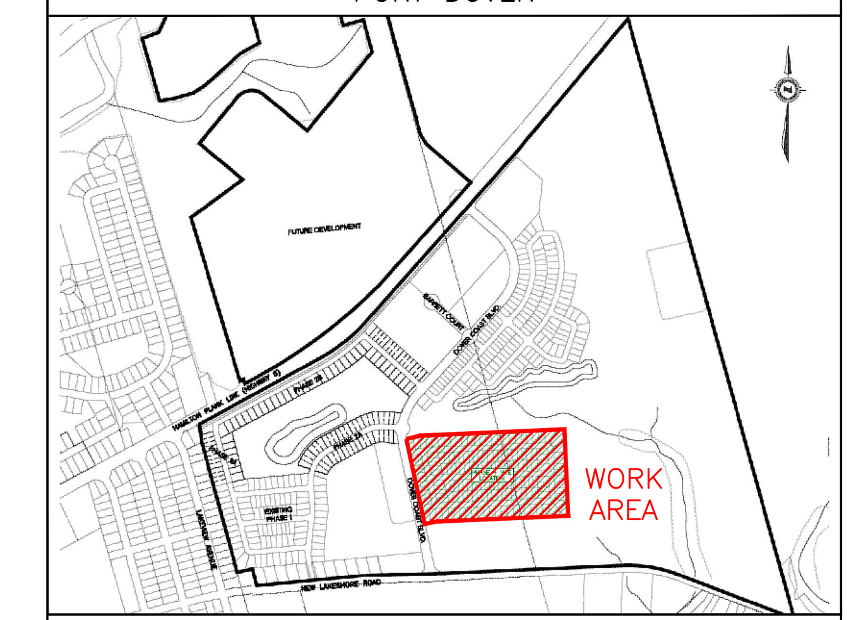
SQUARE D 12 Cct. DISTRIBUTION PANEL WITH 100A MAIN BREAKER
2" PVC CONDUIT OUT TO FIELD
15A GFI DUPLEX RECEPTACLE
BAT HANDLED OVERRIDE SWITCH
ASTRONOMIC TIMER
JUNCTION BOX CONTAINING CONTACTORS AND TERMINALS FOR LIGHTING CONTROL
PLATE MOUNTED ON STANDOFFS FOR TIMER
2" PVC CONDUITS OUT TO FIELD

DISTRIBUTION PANEL COMPARTMENT OUTSIDE VIEW WITH DOOR PANELS REMOVED

GENERAL NOTES:
INSTALLING CONTRACTOR AND ENGINEER MUST ENSURE ACCESS CLEARANCES AROUND EQUIPMENT ARE MAINTAINED. THIS MAY AFFECT HOW THE PEDESTAL IS ORIENTED AND WHERE THE FINAL LOCATION OF THE PHOTOCELL SHOULD BE. FOR PROPER OPERATION, THE PHOTOCELL SHOULD FACE IN THE NORTHERLY DIRECTION.

INFORMATION FROM PEDESTAL SOLUTIONS INC. SPEC SHEET SLM42
DATED AUGUST 17, 2022
https://www.pedestalsolutions.com/slm42?rq=SLM42

KEY MAP (N.T.S.)
PORT DOVER



NO.	DATE	REVISION	BY
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3			
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ERTH HOLDINGS INC.
180 WHITING STREET,
INGERSOLL
ONTARIO, N5C 3B5
Ph: (519) 485-6038
Fx: (519) 425-8456
www.erthcorp.com

DESCRIPTION: SPEC SHEETS

PROJECT NAME: DOVER COAST DEVELOPMENTS PHASE 4 STREETLIGHT DESIGN

CITY/TOWN: PORT DOVER

DRAFTER	CHECKED BY	DATE
K.LAPIER	D.SHEPHERD	2025-09-05
SIZE	**SCALE**	**PAGE**
ARCH D	N.T.S.	5 OF 5

JOB NO.: H-25-009 DRAWING NO.: E-501

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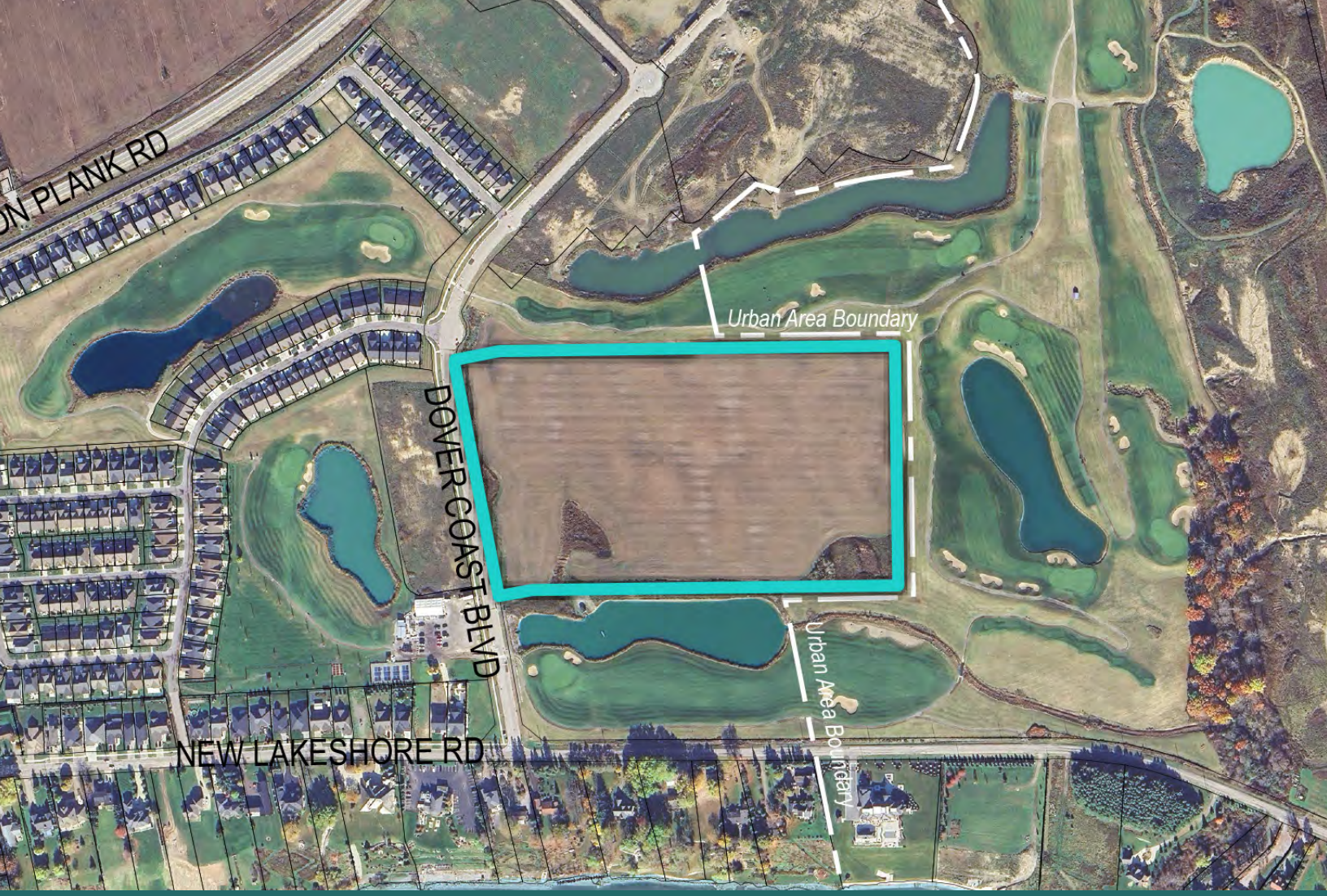


Phase 4 Dover Coast

URBAN DESIGN BRIEF

Dover Coast Blvd.
Port Dover, Norfolk County

MGP Malone Given Parsons.
140 RENFREW DRIVE, SUITE 201
MARKHAM, ONTARIO, L3R 6B3

URBAN DESIGN BRIEF

Phase 4 Dover Coast
Port Dover, Norfolk County

DRAFT PLAN OF CONDOMINIUM

OCTOBER 14, 2025

Prepared by:
Malone Given Parsons Ltd.
140 Renfrew Drive, Suite 201
Markham, ON L3R 6B3
JOB: 25-3446

Prepared for:
Ballantry (Dover Coast) Inc.
20 Cachet Woods Crt, Suite 6
Markham, ON, L6C 3G1

CONTENTS

1.0 INTRODUCTION

The Ballantry (Dover Coast) Inc. ("Ballantry") owns 8.68 hectares (21.5 ac) of vacant land on the east side of Dover Coast Boulevard, north of New Lakeshore Road in Port Dover, Ontario. The property is legally described as Part of Lot 15 and 16, Concession 1 (Geographic Township of Woodhouse), Norfolk County and is known as "Phase 4" of the multi-phase development Dover Coast ("subject property or site"). Earlier phases of residential neighbourhoods have been completed west of the Dover Coast Blvd.

DEVELOPMENT PROPOSAL

Phase 4 proposes a common element condominium plan which consists of 73 single detached dwellings and 48 townhouses (121 units combined). The site is designed around a central park with frontage along Dover Coast Blvd. and a crescent road extending into the property providing two points of access from Dover Coast Blvd. The homes are bungalow style with primary bedrooms on the main floor and primarily anticipated to serve retirees and senior living.

REPORT PURPOSE

Malone Given Parsons Ltd. ("MGP") has prepared this Urban Design Brief in support of the Plan of Condominium application. The purpose of this Urban Design Brief is to describe the physical organization and design approach to illustrate why the proposal is appropriate and desirable. This Urban Design Brief provides insight as to why design decisions were made, describe how the proposal responds to the physical context in situ and illustrates consistency with policies and urban design directions. It confirms that the design approach represents good urban design and has been prepared in accordance with the urban design directions in the Norfolk County Official Plan. It should be read in conjunction with accompanying plans and reports that form the application.

POLICY FRAMEWORK AND ZONING

NORFOLK COUNTY OFFICIAL PLAN

Norfolk County Official Plan 2006, Office Consolidation 2023 ("NCOP") provides direction and tools necessary to direct growth, development and change in the County. Schedule B-16 of the NCOP designates the property "Urban Residential".

Urban Residential lands are intended to "accommodate attractive neighbourhoods providing a variety of residential forms" and "housing types as well as neighbourhood facilities to meet the needs of the local population". This designation generally permits a variety of residential uses and densities as well as supporting uses.

Dover Coast Blvd. is classified as a "Local Road" on Schedule E-3 of the NCOP. Dover Coast Blvd. intersects with New Lakeshore Road to the south and a dead ends just north of the property. Dover Coast Blvd is expected to connect to Hamilton Plan Road (Highway 6) as part of the overall Dover Coast master plan.

LAKESHORE SPECIAL POLICY AREA

Schedule A-1 identifies of the subject property as part of the Lakeshore Special Policy Area ("LSPA") thus subject to the LSPA Secondary Plan. The intent of the LSPA Secondary Plan is to address the unique local contexts and land use structure. The LSPA Secondary Plan community structure, as per Schedule F-1, designates the property within the "Urban Area".

NORFOLK ZONING BY-LAW 1-Z-014

The property is zoned "R4(H)" with Special Provision 14.543 under Norfolk County Zoning Bylaw 1-Z-2014, Consolidation January 1, 2021. The R4 zone permits group townhouse, stacked townhouse, street townhouse, home occupation, accessory residential dwelling unit. Semi-detached, duplex, tri-plex and four-plex dwellings are permitted provided they are located on the same lot with a group townhouse. In addition to the uses permitted in the R4 Zone, Special Provisions #14.543 permits single detached dwelling and semi-detached dwelling on the site.

In lieu of the corresponding provisions in the R4 Zone, the following shall apply:

1/ total number of multi-unit dwellings may not exceed 40 percent of the total number of dwelling units within each development phase;

2/ lot frontage – 0 metres for lots within a condominium providing that the condominium has a minimum of 12 metres of frontage on an improved street or registered and constructed condominium road;

3/ minimum building setback – 7.5 metres except where the side wall of a building abuts another Zone in which case the minimum yard shall be 3 metres;

4/ maximum lot coverage – 40 percent;

5/ minimum separation distance between buildings on the same lot: 3.0 metres between the end walls of dwelling, 15 metres between the front or rear walls of dwellings, and in all other cases the minimum separation distance between walls shall be 9 metres.

A minimum requirement of 2 parking spaces for each dwelling unit is required plus visitor spaces.

OUR APPROACH

Malone Given Parsons Ltd. ("MGP") has prepared this Urban Design Brief to explain and illustrate how the proposed development represents the optimal design solution for the property.

The design proposal has been reviewed in the context of the Norfolk County LSPA Secondary Plan Community Design Guidelines ("LSPA CDG") and the comments from the Record of Pre-Consultation as received from the Norfolk County November 2024.

The document begins with an analysis of the site and the influential surrounding context (Section 2). The design vision, and objectives are then described in Section 3 as well as details regarding the site and building design. Section 4 reviews applicable design policies and directives from relevant documents including the NCOP. The brief concludes with a review of how the design proposed complies to policies and supports design directives.

A number of reports, plans and drawings have been prepared in support of the proposed development, filed under separate cover and should be reviewed in conjunction with this Brief.

It should be noted that the text and images contained in this Brief are only conceptual representations of the intended vision and character of the Proposal and are to be used for illustration purposes only.

2.0 CONTEXT ANALYSIS

SITE LOCATION & CHARACTERISTICS

The property is located on the east side of Dover Coast Boulevard, just north of New Lakeshore Road in Port Dover, Ontario (Figure 1). Port Dover is in Norfolk County and has a population of approximately 8,000 people. Lake Erie is located approximately 300 metres south of the property.

The parcel is generally rectangular in shape with approximately 240 metres of frontage along Dover Coast Blvd and 390 metres of depth. The property is approximately 8.68 hectares (21.45 acres) in size.

The property is relatively flat and currently vacant and undeveloped.

BROADER CONTEXT

The site is surrounded on the north, east and south sides by a golf course - The Links at Dover Coast. The golf course lands are characterized by large open space, consisting of golf fairways, greens and hazards, stormwater management ponds, and trails and paths.

West of Dover Coast Blvd. the land is vacant and planned for future development. New residential neighbourhood from previous development phases are located further to the west.

Large residential lots define the shore line, limiting access and visibility of Lake Erie from New Lakeshore Road.

Figure 1: Air Photo of Subject Property and Surrounding Context

SURROUNDING USES

North: A water hazard and fairway for the golf course is immediately north of the property. Further north is vacant land proposed for a future development residential neighbourhood. Dover Coast Blvd stretches to the northeast through this proposed development. To the north, Dover Coast Blvd ends prior to Highway 6 and is expected to provide connection to Highway 6 in the future.

South: A water hazard and fairway for the golf course is immediately south of the property. It extends to New Lakeshore Rd. South of New Lakeshore Rd. is large, established residential lots along the north shore of Lake Erie. There is one commercial property along this stretch of New Lakeshore Rd., David's Restaurant.

West: On the west side of Dover Coast Blvd, across the street from the subject property is a vacant parcel of land identified for future development. Beyond this vacant parcel is additional golf course and a residential neighbourhoods. Further west is existing built up area of Port Dover defined primarily by singled detached residential dwellings.

Port Dover downtown and marina are approximately 2 kilometres away and contain a concentration of amenities, services, and retail options.

East: A water hazard and fairway for the golf course is immediately east of the property. East of the property is the edge of the urban area of Port Dover which transitions into agricultural uses and rural/countryside landscape.

Figure 2: Broader Context Plan

STREET AND BLOCK NETWORK

The property is connected to the local road network via Dover Coast Blvd. Dover Coast Blvd. connects to New Lakeshore Road to the south and dead ends to the north at Hamilton Plan Road (Highway 6). Dover Coast Blvd. is expected to provide connection to Highway 6 at a future point in time.

As per Schedule E-3 of the NCOP, Dover Coast Blvd, New Lakeshore Road, and other surrounding roads, excluding Highway 6, are classified as a Local Roads. Dover Coast Blvd has two (2) travel lanes, one in either direction. The surrounding street network is a mixed of curvilinear streets that following the golf course and areas which are more grid-like.

IMAGE 1: View of the site northeast along Dover Coast Blvd. (Google 2023)

IMAGE 2: View of the site to the southeast from Intersection of Dover Coast Blvd and Regatta Dr. (Google 2023)

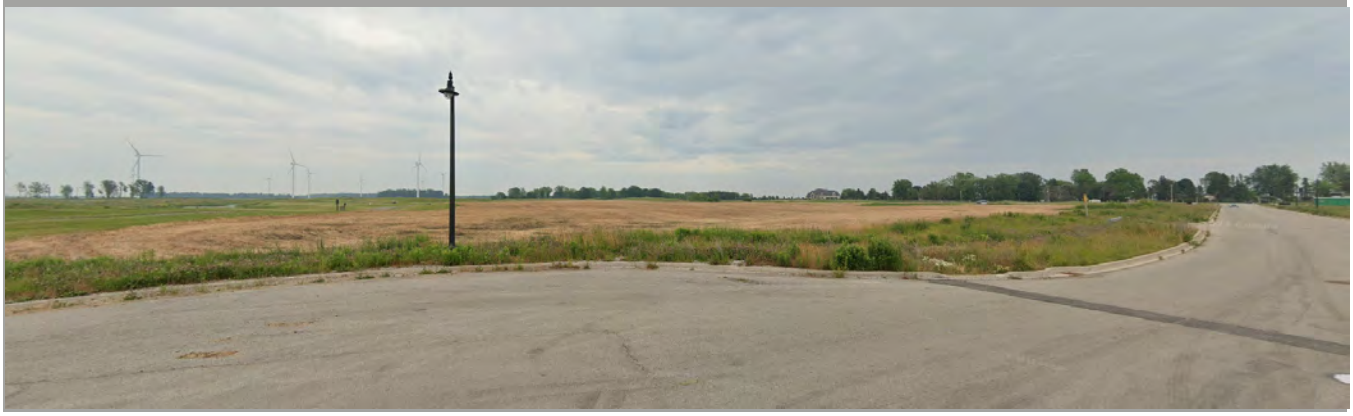
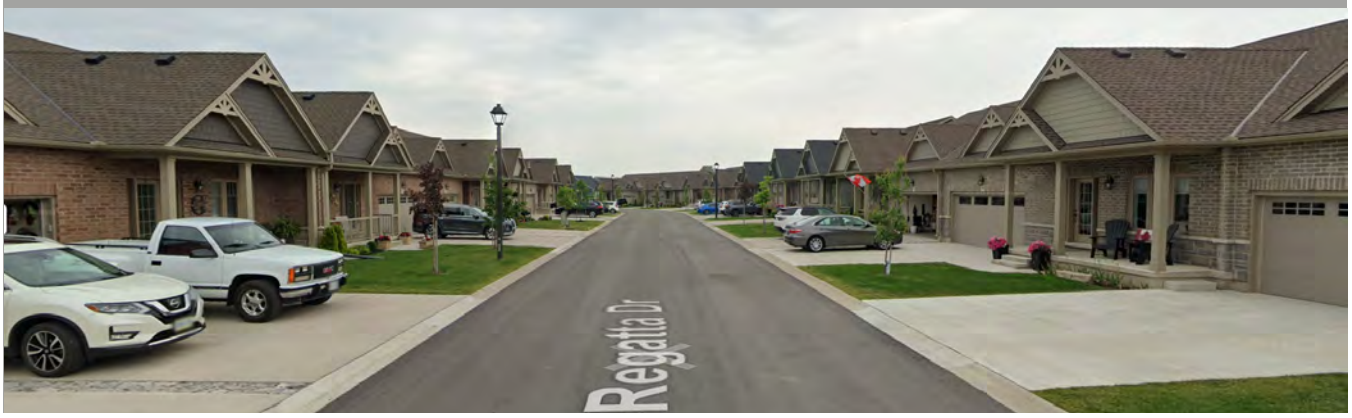


IMAGE 3: View of the existing homes in previous phases along Regata Drive (Google 2023)



TRANSIT

Transit service in Norfolk County is provided by Ride Norfolk. Dover Coast and New Lakeshore Road do not currently have any active bus routes providing local bus service. The closest transit stop to the property to the available the public transit system is Bus Stop No.5 which is 1.75 km meters aways and located on John Street at the intersection of John St and Pansy Ave. Bus Stop No.5 is 1 of 7 stops in Port Dover's only bus route which provides connection through the core built up and downtown area.

TRAILS AND CYCLING NETWORK

Dover Coast Blvd. has a sidewalk on the west side of the road and New Lakeshore Road has a sidewalk on the north side west of Dover Coast Blvd.

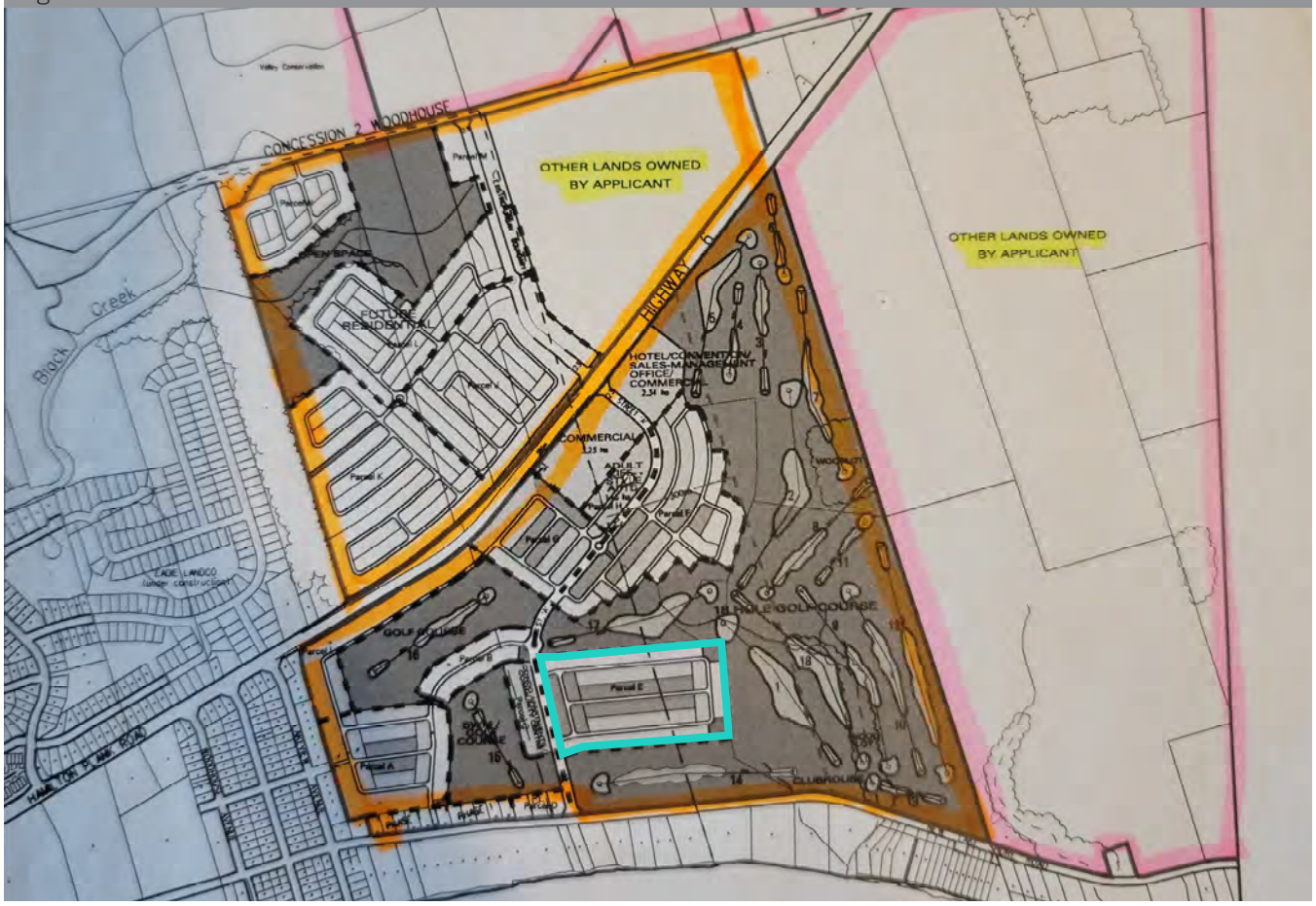
The Lake Erie Waterfront Trail runs along New Lakeshore Road.

PARKS AND OPEN SPACE

There are several public parks in proximity to the property. The Port Dover Kinsmen Park is a Community Park located along New Lakeshore approximately 1.5 km from the property and contains a number of ball diamonds and soccer fields.

Two Neighbourhood Parks are located within the 1-kilometer radius. The Woodhouse Acres Park is located at the north-west corner of the intersection of Woodhouse Ave and New Lakeshore Rd. It is approximately 0.6 ha in size and has a playground. A second neighbourhood park is approximately 0.8 ha., located to the northwest of the property with pedestrian access of Newport Ln. and Donjon Blvd. It contains a circular trail network, 2 ponds, and open space.

Figure 3: Dover Coast Master Plan



COMMUNITY AMENITIES

Access to a wider range amenities, services, amenities, and retail shops is provided in downtown Port Dover along Main Street and the marina area. Along Main Street there is also the Port Dover Arena and Community Centre as well as the local public schools (Lakewood Elementary).

VIEWS AND VISTAS

The golf course surrounding the property on three sides provides wide vistas across the fairways and hazards.

SUMMARY OF CONTEXT

The property is part of a larger master plan which is in various stages of development. The Lake Erie Waterfront Trail is within close proximity along New Lakeshore Road and Port Dover downtown is with a short drive and about a 2.5 km walk.

The development proposal and design approach of the property should focus on its relationship and take design cues from the previous residential phases.

The property is not directly adjacent to any existing buildings or residential dwellings. As such, attention to transitioning built forms, heights, and setbacks is not a concern outside of the appropriate buffer required adjacent to the golf course.

Careful design attention should be given to the site's interface with Dover Coast Blvd. as the primary face to the public realm. Consideration should be given to views and vistas of the property from Dover Coast Blvd.

Figure 4: View of Subject Property Looking Southwest (Google Earth 2022)

3.0 VISION & OBJECTIVES

VISION

The proposal envisions the development of a high quality residential community containing a mix of single detached and townhouse dwellings that cater to the needs of an aging population and respect the existing character of Port Dover and previous phases of Dover Coast. Modern farmhouse styled homes are envisioned around a logical street network and a well appointed central park. The park will be a defining structural element with exposure along Dover Coast and easy internal access. The park will provide a variety of active and passive recreational amenities as well as enhanced landscaping. The park and homes along Dover Coasts will enhance the public realm along the street.

DESIGN PRINCIPLES

The following objectives summarize the design goals in the context of the vision, surrounding uses, and the planned function for the area.

- **Compatibility:** Establish a context sensitive design approach through a built form that is compatible with the established character of the area and open space nature of the golf course.
- **Streetscapes:** Ensure an attractive and walkable streetscape along Dover Coast Blvd. through enhanced landscaping and elevations that are visible from the public street.
- **Pedestrian Realm:** Establish a safe, interconnected, and accessible pedestrian realm within the site including pathways to easily access the park.
- **Human-scaled:** Employ architectural design elements that enhance the human-scale through highly visible entry points, porches / stoops, dormers, windows, projections and recessions, and roof pitch.
- **Architectural Design:** Ensure a high-level of architectural design and construction materials. Employ appropriate architectural elements including roof pitch and style, articulation and recession, scale and position of windows and doors, cornices and eaves, arches or pediments, and porches/balconies to clearly express the building style and provide interest without adding “fake” elements that are meant to invoke a style.
- **Transition and Edges:** Appropriately address the site edges through transitional landscaping design and architectural elements.
- **Landscaping:** Use distinct, attractive, and appropriate landscaping and plantings to enhance the pedestrian realm and character of the central park. Use low-maintenance, drought-tolerant plantings that are appropriate to the local climate and weather connections.
- **Quality Open Space:** Design the park to provide passive and active recreational opportunities as well as encourages informal and neighbourhood gatherings.
- **Safety:** Use design practices that contribute neighbourhood safety such as Crime Prevention through Environmental Design (CPTED) principles that ensure ‘eyes on the street’ and other passive design approaches to support natural surveillance. Providing ample street lighting for well-lit public spaces at night, allowing for uninterrupted site lines along streets, demarcating between private and public spaces for optimal territoriality and security.

Figure 5: Site Plan

IMAGE 4:Example Elevations of Single Detached Dwellings

4.0 DESIGN DETAILS

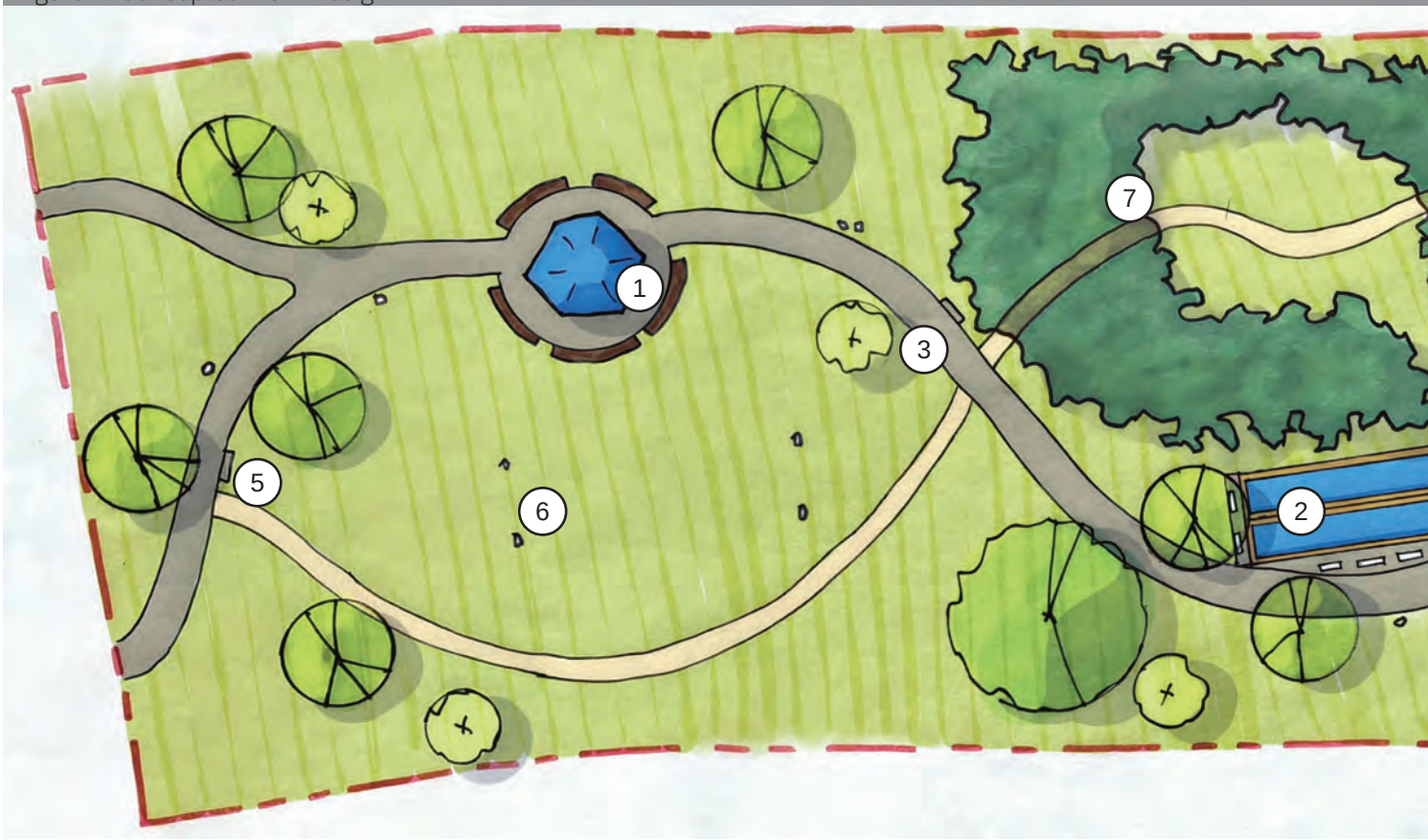
SITE ORGANIZATION

The site has been organized around a 1.4 ha central park. Two points of vehicular access from Dover Court Blvd. are proposed north and south of the central park with homes backing onto the park. New private streets will extend through the property creating a crescent shaped road. Single detached dwellings are proposed along the east-west streets, while townhouse will be situated within the site along the two north-south streets on the east side of the plan.

PARK

The large central park has been designed to provide numerous passive and active recreational activities and amenities. The park has will incorporate recreational features such as a paved walkway, pavilion, bocce court, seating, informal trails and paths, treed areas, and boulders for informal play. Access to the park is provided from Dover Coast and two internal pedestrian walkways at the east end of the park.

Figure 7: Conceptual Park Design



Design Features:

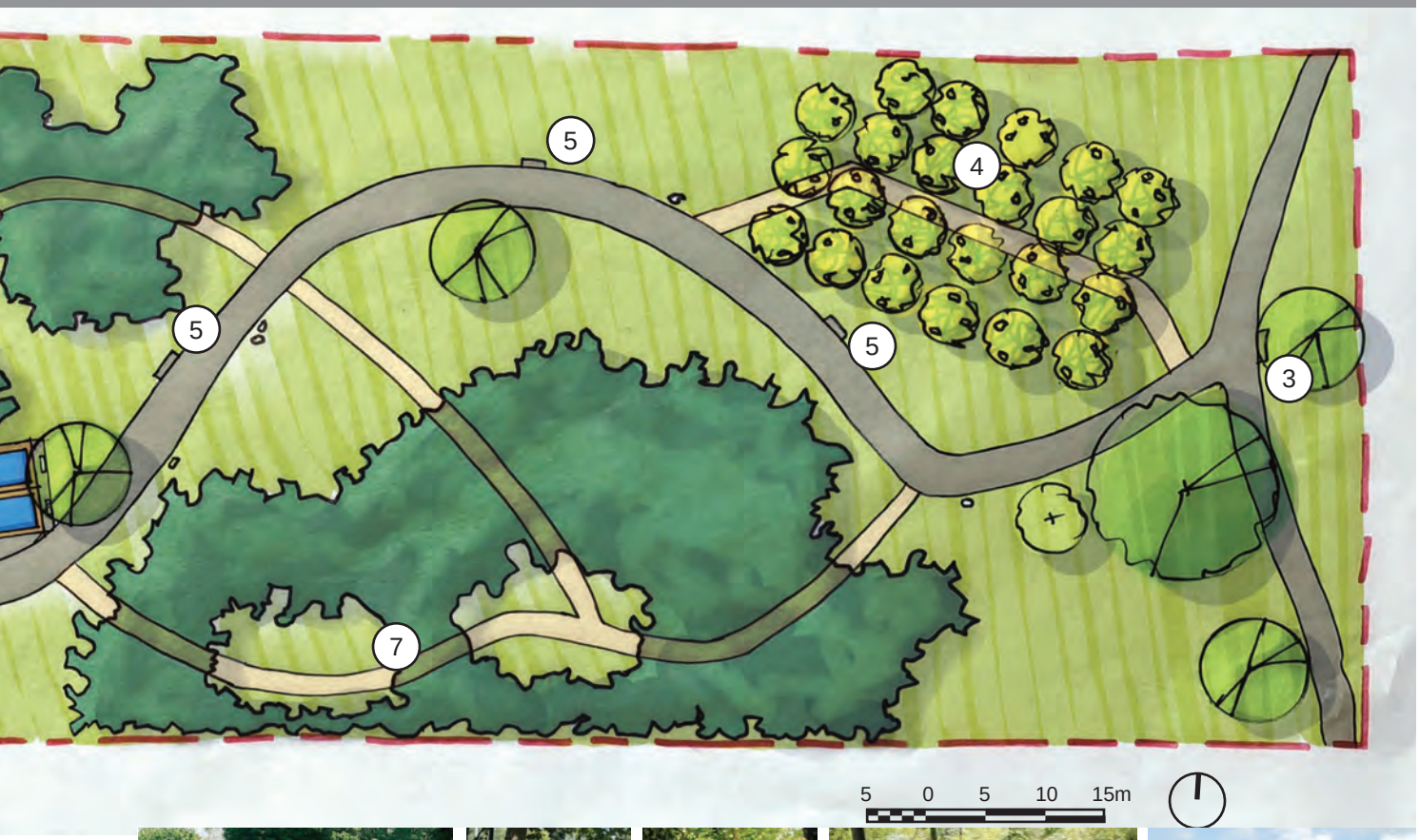
1. Welcome Pavilion / Shade Structure with game tables and annual beds for community use
2. Seasonal Bocce Ball court with seating
3. Walking trails with seating
4. Fruit Orchard
5. Adult exercise workout circuit
6. Boulders for Informal Play
7. Accessible "Woodland" trails, with adjacent natural decorative elements (e.g. logs, boulders)

LOTS AND BLOCKS

The single detached homes on proposed on 16.15 metres wide by 33 metres deep part lots while the townhouse homes are proposed across 9 blocks of 4 townhouse dwellings and 2 blocks of 6 townhouse dwellings. Townhouse part lots are a minimum 9.2 metres wide by 33 metres deep. The lots are sized sufficiently to provide the minimum zoning requirements of separation between sides of dwellings and 15.0 metres between a side and rear of dwellings.

CONNECTIVITY

Internal pedestrian access and circulation will be provided via the new common element condominium streets. Pedestrian connections to central park and local streets are provided at the east end of the park east of condo blocks 59 and 60. Pedestrian access from Dover Coast Blvd will be provided via existing sidewalks and crossings at the new streets.



STREETS

The common elements streets are sized 14 metres wide and will provide about 8metres of pavement for driving and street parking, consistent with the adjacent developments. Rolled curbs, lights and street trees will help to define the street and transition to the private dwellings.

COMPATIBILITY AND INTERFACE

The design provides an appropriate interface with the golf course. The 1 -2 storey homes are compatible with the surrounding buildings and dwellings. The proposed layout, built form, and massing will not create adverse issues. Furthermore, the location of the access points onto Dover Coast Blvd does not conflicts with the existing road network or access to adjacent parcels or existing neighbourhoods.

ARCHITECTURE

A mix of contemporary and traditional farmhouse styled façades are proposed that provide architectural interest, reflect a human scale and are compatible with previous phases and respect the character of Port Dover (Examples in Image 4, 5 and 6). Variation in facade styling and a mix of materials including stone, brick and/or siding will create interest and establish a cohesive image.

LIGHTING

The lighting plan ensures the site has sufficient lighting to provide visibility for pedestrians and vehicles along the streets and within the park. Light standards will be consistent with those in previous phases.

IMAGE 5: Example Townhouse Elevations

5.0 DESIGN DIRECTIVES

NORFOLK COUNTY OFFICIAL PLAN

COMMUNITY DESIGN PRINCIPLES

The Norfolk County Official Plan establishes the vision, principles and supporting policies to guide the Town's evolution and development. Section 5.4, Community Design, emphasizes that excellence in community design is essential to creating a physical environment where people have the appropriate places to interact, live, work, recreate and learn.

SECTION 5.4 COMMUNITY DESIGN

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 enhances and maintains the character of the existing built-up urban areas in Port Dover. The design utilizes a consistent and similar built form to the previously constructed phases and supports a pedestrian-friendly place with connections to the park and local street network. The proposed built form, architectural style, and choice of high quality materials will provide a sense of identity and establish a natural extension of the design characteristics present in the existing 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;

The proposal has been designed respecting the existing character and overall master plan. The proposal is compatible with the existing low density residential nature in building form and style and compliments the local character and identity of the area with a traditional street pattern around a central park.

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 low density residential uses, single detached and townhouse dwellings will have no adverse impacts on the adjacent golf course and have been planned comprehensively.

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 Proposed Development does not contain reverse lotting on Provincial Highways and County Roads. Noise attenuation or privacy fencing exercises are not expected to be required.

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

The streetscaping of the proposed development is consistent with and reflects the existing streetscapes present in the previous development phases.

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

The proposed park has been designed as a central focal point for the development. A well thought design plan with quality features, landscaping and amenities is proposed. The park will provide valuable outdoor amenity space for residents. With visible frontage along Dover Coast Blvd. it will enhance the public realm.

m) The County shall encourage development to be designed 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 lighting plan for the proposal demonstrates that appropriate lighting will be provided and buildings have been situated to maximize natural surveillance through visual overlook onto streets and open space.

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 proposal has been designed regarding accessibility for persons with disabilities and approach living space for seniors. The single storey homes provide single level living with minimal rise at the front door.

PORT DOVER WATERFRONT SPECIAL POLICY AREA

The Port Dover Waterfront Special Policy Area includes the site. Section 6.5.2.2 encourages attractive and diverse public and private sector development that is compatible with the character and charm of the existing community. Section 6.5.2.2.c further provides general design policies for the Port Dover Waterfront Area.

Section 6.5.2.2.c i) buildings should be designed to front adjacent streets and to provide interest and comfort at ground level for pedestrians. In instances where corner lots or through lots are provided, buildings shall be designed so that all elevations facing a street present a 'front' elevation. The Zoning By-law will establish appropriate setbacks, or build-to lines for development;

The proposed design conforms to the established setbacks set out in the Zoning By-Law and the built form has been designed to ensure appropriate scaling and comfort for the pedestrian experience.

ii) streets should be designed to accommodate all modes of transportation, including walking, cycling, cars, service vehicles, and public transit;

The proposed streets have been designed consistent with other streets in the area and accommodate all transportation modes.

iii) streets and sidewalks shall create a pedestrian environment through defined standards for landscaped areas, paving, street trees, and other appropriate street furniture, and shall form a connected system of optional routes to, from and within the area;

The design provides access points to the internal centralized park and connects to the existing sidewalks along Dover Coast Blvd.

NORFOLK COUNTY LAKESHORE SPECIAL POLICY AREA SECONDARY PLAN

The property is designated within the Lakeshore Special Policy Area and is subject to the Norfolk County Lakeshore Special Policy Area Secondary Plan ("LSPA Secondary Plan") and Norfolk County Lakeshore Special Policy Area Secondary Plan Community Design Guidelines ("Lakeshore Design Guidelines"). The LSPA Secondary Plan provides specific emphasis on Sustainable Neighborhood Design, Streetscapes, and Safe Community Design.

STREETSCAPES

Section 11.8.2.2 emphasizes the importance of streets to shape our perception of the environment, and as such, they should be carefully designed to enhance our sense of community. The following policies are applied with respect to the supported public frontages and design treatments:

a) Sidewalks shall be generally provided to ensure public safety where pedestrian traffic warrant them and they do not conflict with the rural character of the environment.

Sidewalks are provided along Dover Coast Blvd. The proposed streets will be private, slow internal streets. Shared travel is appropriate for all modes.

b) Suitable lighting shall be provided for the illumination of vehicles, pedestrians and cyclists, while reducing light emissions to the sky in support of the promotion of dark sky communities.

The lighting plan illustrates that sufficient illumination will be provided for vehicles, cyclist and pedestrians but will not be over lit to impact dark skies.

c) Street furniture, including lighting, signage, bicycle parking facilities, benches, newspaper boxes, utilities, and garbage facilities shall be designed and placed within a consistent form, pattern, shape and material to avoid clutter and facilitate readability.

Street furniture will be placed in a consistent manner, quality, and care to ensure they reflect the welcoming and high-quality nature of the proposed development.

e) The length of blocks shall contribute to a more pedestrian environment by encouraging short and regular block lengths to make walking efficient and allow variation in routes.

The crescent shaped street in combination with the pedestrian access points into the park will provided a variety of efficient pedestrian routes to strengthen the local pedestrian environment. Access to the park is located centrally between the transition point of the single detached dwellings and the townhouse blocks along the east boundary of park.

f) The connectivity between sidewalks and trails shall be promoted.

The pedestrian crossings on Dover Coast Blvd will provide pedestrian access sidewalks on the west side of Dover Coast Blvd which leads south directly to connection with the trail.

h) The comfort of the pedestrian environment shall be considered, particularly with respect to the provision of appropriate shade, lighting and shelter.

The conceptual park design provides sufficient shade and shelter for users.

i) Provide features which contribute to the definition of public open spaces, through the framing of views and focal points, direction of pedestrian movements, and demarcation of different public spaces and functions.

The central park will provide a focal point for Dover Coast Blvd. Dwellings that have visible facades from Dover Coast Blvd. will have enhanced architectural treatment to improve the pedestrian realm along Dover Coast and frame the park. This will provide clear communication of the parks location and function within the local community.

SAFE COMMUNITY DESIGN

Section 11.8.2.3 of the LSPA Secondary Plan encourages the integration of principles of Crime Prevention Through Environmental Design. New developments are encouraged to promote continuous occupancy of public spaces by encouraging uses, activities and businesses that provide public presence throughout the day and are adjacent to public spaces.

The central proposed park has been designed to encourage active use throughout the day and encourage residents to utilize the pedestrian networks in their community to access it ultimately providing more sets of eyes throughout the community.

Section 11.8.23 further encourages the provision of opportunities for visual overlook and accessibility to public spaces, streets, and parks.

The bordering dwellings surrounding the central park as well as the frontage of the park on Dover Coast Blvd provide significant opportunities for clear, unobstructed views of the park. The built form, as well as the use of the pedestrian network to access the central park, will encourage "eyes on the street" and natural surveillance.

NORFOLK COUNTY LAKESHORE SPECIAL POLICY AREA SECONDARY PLAN COMMUNITY DESIGN GUIDELINES

The Lakeshore Design Guidelines provide guidance for the future development of the waterfront related settlement areas while protecting and enhancing the valuable characteristics of each individual place. Port Dover is defined as one of two main port towns within the Norfolk County Lakeshore area. Section 2.1 of the Lakeshore Design Guidelines provides additional policies for Port Dover and defines 12 different character areas.

The Subject Property is not captured under any specific character area, however, it can still be evaluated against the general policy in Section 2.3 which emphasizes Port Dover's strong and resilient character defined by its small town size, larger street network, and number of well-established neighbourhoods with a wide range of types, material, and architectural style.

The proposal respects and embraces Port Dover's character through built form, streets and parks that continue the character of previously built phases. It has been designed as a natural extension of the existing neighbourhoods to the west providing a distribution of dwelling types, setbacks, buffers, materials, and architectural styles that are respective and representative of the character and identity shown in the local context.

6.0 CONCLUSION

In conclusion, this Urban Design Brief illustrates that the proposed design appropriately addresses the context in which it is will be situated. Dwelling locations, arrangement of streets, park location and design and architectural treatment represent good urban design with respect to the site's context within a larger planned community.

The proposed single detached and townhouse dwellings will respect and compliment the character of the existing neighborhood while enhancing the local community through inclusion of the centralized park. The proposed layout and site organization will provide proper transition to the golf course, new park and Dover Coast Blvd. surrounding the property.

The proposal considers the relevant urban design directions provided in the Norfolk County Official Plan, specifically relevant direction related to the Norfolk County Lakeshore Special Policy Area Secondary Plan and Norfolk County Lakeshore Special Policy Area Secondary Plan Community Design Guidelines.

The proposal represents an appropriate design solution for the site and will positively contribute to the character of Port Dover and the Dover Coast neighbourhood.

IMAGE 6: View of Subject Property Looking North East (Google Earth 2022)


MGP

development engineering (London) Limited

CONSULTING CIVIL ENGINEERS

Technical Memorandum

Date: July 18, 2025

To: Water Engineering Division, Norfolk County

Subject: **Water Servicing Letter to Address Phase 4 of Dover Coast Subdivision**
DevEng Project Number: DEL13-124P4

Introduction

Development Engineering (London) Limited [DevEng] has been retained by Ballantry Homes to prepare detailed engineering design for Phase 4 of the Dover Coast Subdivision development in Port Dover, Ontario. As part of the Phase 2 engineering submission, DevEng prepared and submitted the *Dover Coast Development – Phase 2 Water Servicing Report* (dated: March 6, 2015). This Technical Memorandum is provided to supplement the above-noted report based on the detailed design of Phase 4.

Existing Water Distribution Network

Existing Infrastructure

There is an existing municipal watermain within the road allowance of Dover Coast Boulevard. The 300 mm PVC main is located on the far side of the right-of-way (ROW) from the proposed development. The main is serviced by the existing Port Dover water distribution system, which is fed by the municipal water tower located ±1.0 km west of the proposed development.

The existing 300 mm main within Dover Coast Boulevard was designed and constructed as part of Municipal works for Dover Coast Subdivision, refer to the 'As Constructed' drawing M17 by DevEng in Appendix A.

Boundary Conditions

A fire hydrant flow test was completed by Classic Fire + Life Safety on June 26, 2025, and the test results can be seen on the Flow Test Report in Appendix A. The test monitored static pressures on the Municipal hydrant located on the west side of Dover Coast Boulevard, south of Regatta Drive. The results indicated a static pressure of 60 psi (kPa) with a residual pressure of 50 psi (kPa) under a test flow of 1,501 USGPM (95 L/s). Using the test results, a peak fire flow was extrapolated to estimate the available fire flow at a pressure of 20 psi (140 kPa). The extrapolated fire flow is approximately 3,173 USGPM (200 L/s) at the residual hydrant.

The water distribution network boundary condition is represented in the hydraulic modeling by a reservoir at the connection to the existing municipal water distribution network with a pump curve based on the results of this flow test.

Design Criteria & System Demands

Norfolk County Design Criteria

This report aims to demonstrate the water distribution network proposed for the ultimate build-out of the Phase 4 development that satisfies Norfolk County requirements as follows:

- During the maximum day domestic demand plus fire flow demand scenario, system pressures shall not be less than 140 kPa (14.28 m H_2O or 20 psi);
- During the maximum/peak hour domestic demand scenario, system pressures shall not be less than 280 kPa (28.55 m H_2O or 41 psi); and,
- Maximum pressure should not exceed 690 kPa (70.36 m H_2O or 100 psi).

Although not specified with the Norfolk County Design Criteria, as a best-management practice, the target for turnover to ensure adequate water quality is as follows:

- During the average day demand, water shall not remain unused in the main for more than 3 days (72 hours).

Domestic Demands

The proposed development will consist of a combination of different development types including Single-Family and Medium Density residential. The assumed population density is 3.0 persons per unit and 2.4 persons per unit for Single-Family (Residential-Single) and Medium Density (Residential-Multi>3 units), respectively. The assumed average daily demand is 285 litres per person per day. This domestic demand was used for the water distribution model, as taken from Norfolk County's changes to Development Standards/Guidelines (dated November 28, 2024; ref. to correspondence in Appendix A).

Fire Protection Demands

Fire flow demands have been established from the Norfolk County's changes to the Development Standards/Guidelines (November 28, 2024). As outlined in the correspondence (Appendix A), the required fire flow of 85 L/s and 150 L/s for Single-Family and Medium Density, respectively.

Proposed Water Distribution Network

Watermain sizes within the development will range from 200 mm to 250 mm in diameter. An iterative design approach was taken to optimize sizes and provide looping throughout. Water valves and fire hydrants are proposed in standard locations throughout the development in accordance with Norfolk County Design Criteria, to provide adequate fire protection to each lot/block.

The proposed watermain network and sizing for the ultimate build-out scenario are included on the WaterCAD network diagrams in Appendix C, and the proposed Water Distribution Schematic is provided in Appendix B.

Water Distribution Model & Results

The water distribution network was modeled using WaterCAD Version 8.1i released by Bentley Systems Inc. While EPANET 2.0 by the US Environmental Protection Agency (EPA) is widely accepted for water distribution modeling, the WaterCAD model can be converted to an EPANET model if the County requires a copy for review.

Ultimate Build-out

The results of the average day, peak hour, and worst-case fire flow scenarios for the ultimate build-out scenario have been summarized in Table 1 below. Refer to Appendix C for the WaterCAD model schematics and the complete model outputs.

Table A: Worst Case WaterCAD Results – Ultimate Build-out

Scenario	Minimum Pressure	Node	Max Velocity (m/s)	Pipe	Max Water Age (hrs)	Element
Average Day	396	J-9	0.04	P-1	56.76	P-15
Max Day + Fire Flow @ H-2	140	H-2	4.86	P-1	N/A	N/A
Max Day + Fire Flow @ H-5	152	J-9	4.89	P-1	N/A	N/A
Peak Hour	396	J-9	0.14	P-1	14.45	P-15

The ultimate build-out scenario water distribution network satisfies the County's pressure criterion (pressure > 140 kPa) during the Maximum Day plus Fire Flow scenario.

During the Peak Hour scenario all pressures and velocities for the ultimate build-out scenario water distribution network satisfy the County's requirements for minimum pressure (pressure > 280 kPa).

During the average day demand scenario, the maximum age of water is less than 3 days (72 hours).

Hydrant Colour Coding

There are five hydrants proposed within the Phase 4 development. Each of the hydrants has been modeled in order to verify the maximum fire flow available while maintaining the 140 kPa pressure requirement of Norfolk County and identify hydrant colour coding requirements in accordance with NFPA 291. The results of the hydrant modeling are included in in Table B below. Refer to Appendix D for hydrant model output and model diagram.

Table B: Hydrant WaterCAD Results

Hydrant ID	Pressure at required Fire Flow (kPa)	Maximum Flow at 140 kPa (L/s)	Maximum Flow at 140 kPA (L/min)	Class	Colour
H-1	308	147.81	8,869	AA	Light Blue
H-2	140	150.05	9,003	AA	Light Blue
H-3	164	155.31	9,319	AA	Light Blue
H-4	337	166.04	9,962	AA	Light Blue
H-5	156	154.97	9,298	AA	Light Blue

Conclusion

The ultimate build-out scenario of the proposed Phase 4 development water distribution network satisfies the pressure requirements for fire protection during maximum day demands, the pressure requirements during peak hour demands, and the water turnover recommendation during average day demands. Based on meeting these criteria, it can be concluded that the proposed water distribution network is adequately sized and meets the Norfolk County requirements during the ultimate build-out of Phase 4.

We trust this letter and supporting appended documents address the water servicing design requirements to support the Site Plan Approval and proposed detailed design for the Phase 4 development of Dover Coast Subdivision. If there are any questions, comments, or concerns, please do not hesitate to contact our firm.

Troy Winger, E.I.T.
Designer

Derek Hoevenaars, P.Eng.
Senior Project Engineer

Submitted by:
Development Engineering (London) Limited

On Behalf of:
Ballantry Homes

Appendix A: Background Information

Dear Community Development Partners:

On November 28, 2024 we met to share some proposed changes to our Development Standards/Guidelines and to receive your feedback on same.
The items discussed were:

1) **Water and Sanitary Demand and Output Parameters (including PPU component)**
2) **Fire Flow Targets**
3) Storm Pond Sizing and Construction Parameters
4) Servicing Standards
5) TIS Guidelines

We thank you again for the time taken to meet with us and to discuss these matters. The received comments and our responses to them are set out in the attached tables for your review. We are now proceeding to advise Council on matters 1 and 2 above. The remaining matters remain under review and we hope to address these in April/May. A separate report for each of these matters will be presented to **Council on Committee on March 11, 2025.** The report is now available and can be viewed online at: https://pub-norfolkcounty.escribemeetings.com/Meeting.aspx?Id=59305923-46d4-488b-8181-97e689742ec9&Agenda=Agenda&lang=English

To summarize the proposed changes on items 1 and 2 above are set out below.

Based on feedback and internal discussions, the proposed **Water and Sanitary Demand and Output parameters and associated persons per unit (PPU component)** are proposed to be revised to:

Proposed Per Capita Flow/Demand	
Water	285 L/c/d
Wastewater	285 L/c/d
Persons per unit Component (by zone basis)	
Low Density Res	25 units/ha at 3.0 ppu
Medium Density Res	75 units/ha at 2.4 ppu
High Density Res	150 units/ha at 1.6 ppu
Single and semi detach	3.0 ppu
Town/rowhomes	2.4 ppu
Apt and ADU's (2+ bdrm)	2.0 ppu
Apt and ADU's (1 bdrm)	1.6 ppu

Based on feedback and further internal review, Fire Flow Assessments will be completed through the following process to confirm that the **Available Fire Flow (AFF)** meets or exceeds the **Required Fire Flow (RFF)**:

The **Available Fire Flow (AFF)** will be determined through modeling or on-site hydrant testing (as confirmed by Norfolk County).

The **Required Fire Flow (RFF)** for a site will be determined as the greater of that defined by the Ontario Building Code calculation (applied to Part 3 AND Part 9 structures) for the highest demand structure on the site, **OR** the fire flow target as set out in the table below for the land use type. FUS calculations will no longer be required.

Land Use Fire Flow Target Table:

Land Use	Applicable Community	Proposed Land Use Fire Flow Target
Industrial	All communities	150
Institutional	All communities	150
Commercial	All communities	150
Small ICI (<1,800m^3)*	All communities	100
Residential (Single)**	Simcoe, Delhi, Port Dover	85
	Waterford, Port Rowan, Courtland	50
Residential – Multi > 3 units	Simcoe, Delhi, Port Dover	150
	Waterford, Port Rowan, Courtland	90
Residential – Multi <3 units (i.e. Semi-detach dwellings)	Simcoe, Delhi, Port Dover	125
	Waterford, Port Rowan, Courtland	70

*- This target level has been set for smaller forms of stand alone ICI structures.
**- For isolated cases of small scale Residential - Single development located where looping is not a realistic solution to achieving the target, a lower target may be reasonable at the discretion of Norfolk County

A draft form for the completion of the required Fire Flow assessment is attached.

Should you have any questions or comments, please contact myself of Jacob Columbus.

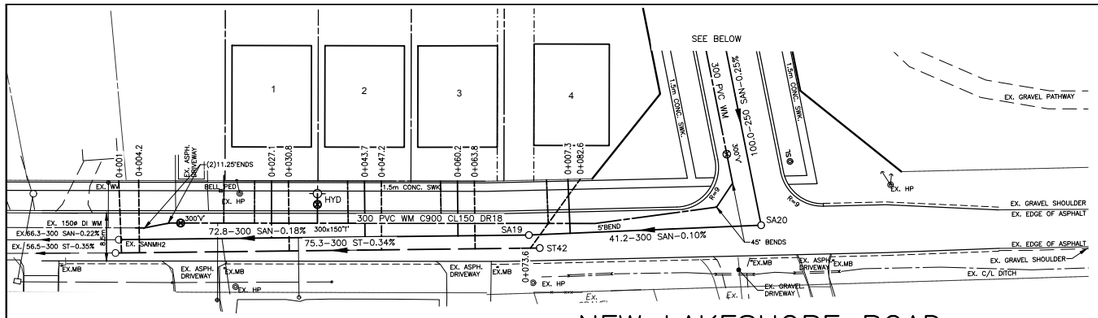
Sincerely,

Darnell Lambert, C.E.T.
Director, Engineering
Gilbertson Administration Building
Engineering
12 Gilbertson Drive, Simcoe, Ontario, N3Y 4N5
519-426-5870 x1094

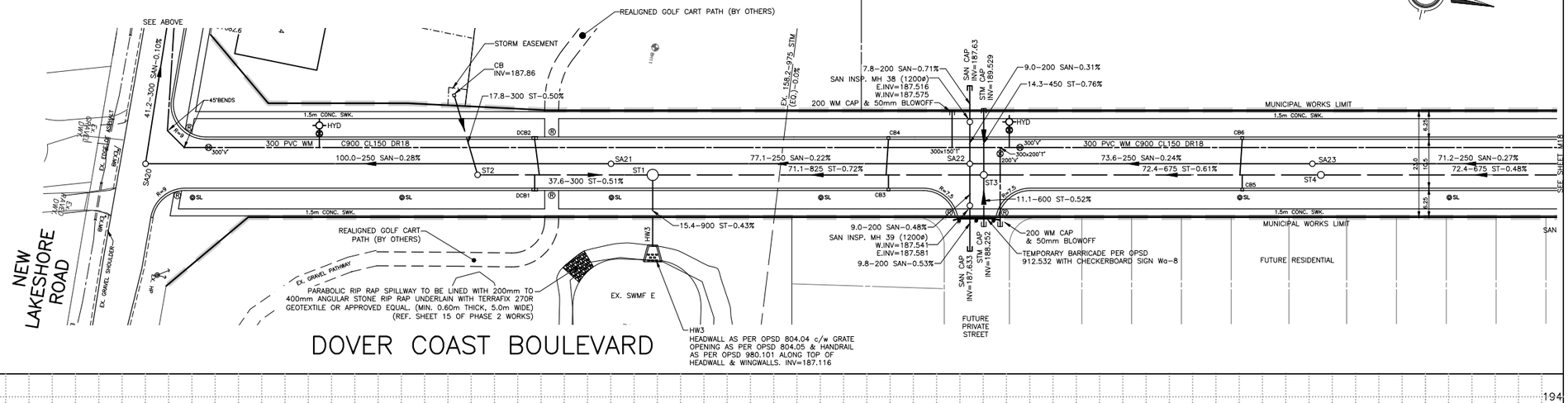
Norfolk COUNTY

Providing valued public services that are responsive to our community's needs

We are committed to providing high-quality customer service and a safe and respectful environment for all. Read our Respect and Responsibilities Policy at norfolkCounty.ca/RR.



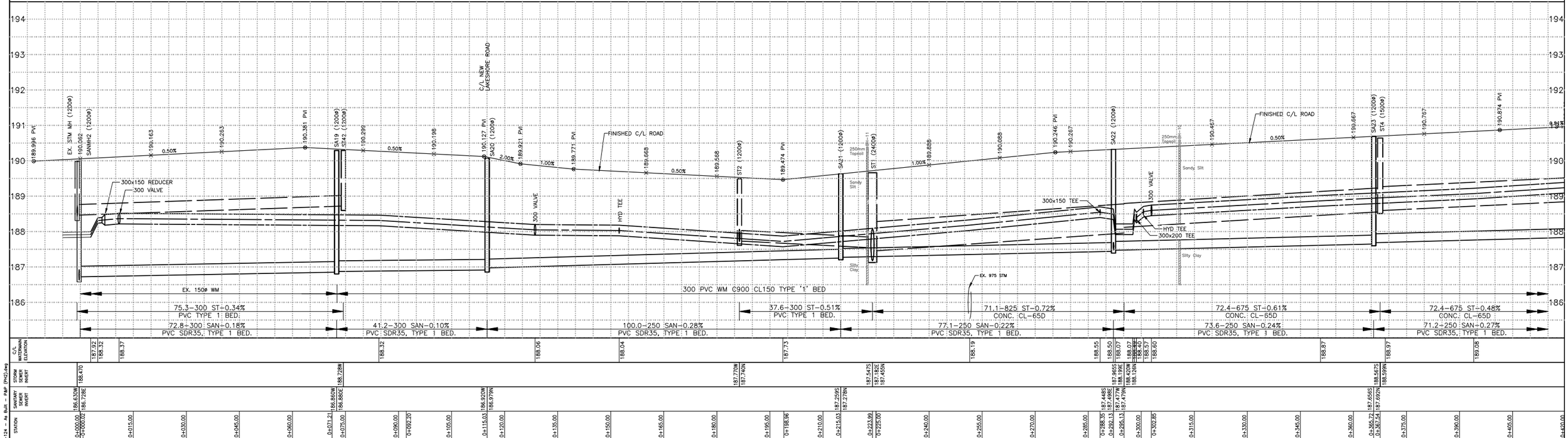
NEW LAKESHORE ROAD



DOVER COAST BOULEVARD

DENOTES 300x300 "T", 150 GATE VALVE & 3-WAY HYDRANT WITH STORZ CONNECTION

MUNICIPAL ROAD 'A' CURB AND GUTTER – OPSD 600.040
NEW LAKESHORE ROAD CURB AND GUTTER – OPSD 600.100



EXISTING SERVICES	DRAWING #, SOURCE	DATE

AS CONSTRUCTED SERVICES	COMPLETION
SANITARY SEWERS, MHs & PDCs	JUNE 2016
STORM SEWERS, MHs, CBs & PDCs	JUNE 2016
WATERMAIN & WSCs	JUL. 2016
GRANULAR BASE	AUG. 2016
CURB & GUTTER	AUG. 2016
SIDEWALK	
PAVING – BASE	SEPT. 2016
PAVING – SURFACE	

DETAILS	CONSULTANT
DESIGN BY JR	DE(L)L
DRAWN BY JR	DE(L)L
CHECKED BY JF	DE(L)L
F.BK. 1054	DE(L)L

No.	REVISIONS	DATE	CONSULTANT
1	FIRST SUBMISSION TO COUNTY	MARCH 06/15	DE(L)L
2	SECOND SUBMISSION TO COUNTY	OCT. 29/15	DE(L)L
3	REVISED PER COUNTY COMMENTS	JUNE 01/16	DE(L)L
4	AS CONSTRUCTED	OCT. 2016	DE(L)L

FILE: DEL13-124 – AS BUILT – P&P (PH2).DWG

CONSULTANT OR DIVISION

Consulting Civil Engineers
41 Adelaide St. N., Unit 71
London, Ontario N6B 3P4
Phone (519) 672-8310
Fax (519) 672-4182
e-mail: deveng@sbeveng.net

development engineering (London) Limited
CONSULTING CIVIL ENGINEERS

ENGINEER'S STAMP

Norfolk COUNTY

SCALE
HORIZONTAL – 1:500
5 0 10m
VERTICAL – 1:50
0.5 0 1m

TITLE
DOVER COAST – MUNICIPAL WORKS
PORT DOVER, ONTARIO

NEW LAKESHORE ROAD & DOVER COAST BOULEVARD
STA. 0+000 TO STA. 0+420

PROJECT No. DEL13-124
SHEET No. M17
PLAN FILE No.

DEL13-124 – As Built – P&P (Ph2).dwg
jsountsos Oct/14/16-9:52am

CLASSIC FIRE + LIFE SAFETY

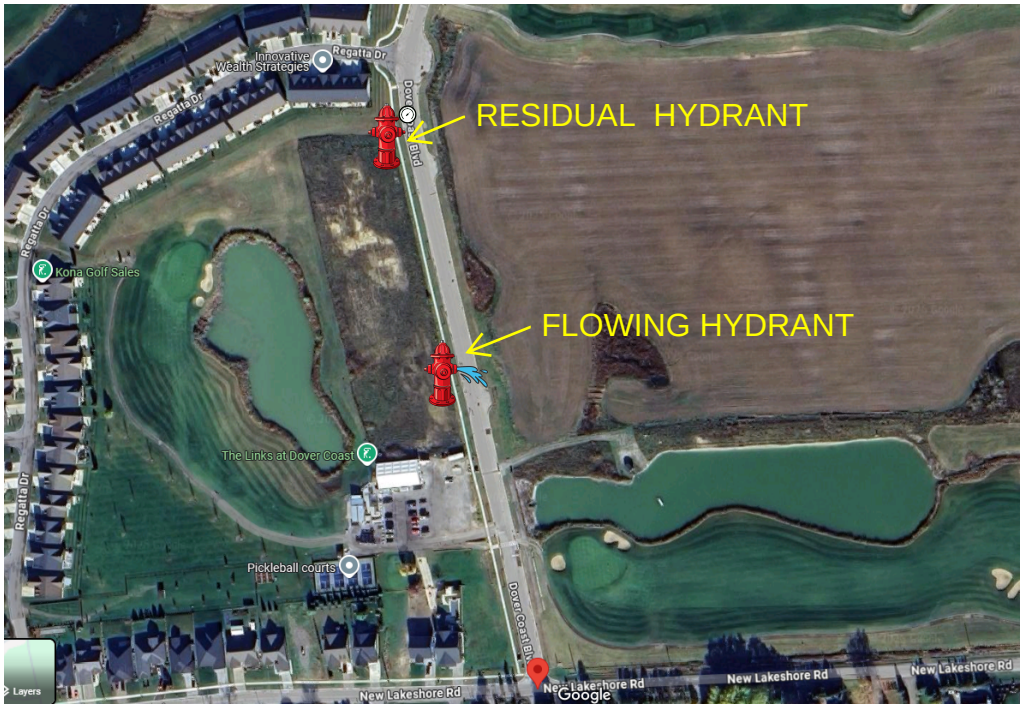
FLOW TEST REPORT

Form SD-003B RevDate: Nov 29, 2021

PROJECT INFORMATION			
Project Name:	Port Dover Flow Test #1	Const. Project #:	SMC-0016023.
Site Address:	Dover Coast Blvd, Port Dover ON	Design Project #:	2025-CFLS-316
City Contact:	Terry Hall	Phone #:	519-426-5870
CFLS Contact:		Phone #:	
Technical Contact:	**Andy Coghlin**	Phone #:	**519-476-0761**

SITE INFORMATION

SITE MAP



Note: If the main is a dead end, the flowing hydrant shall be closest to the dead end

ITEMS TO LABEL ON MAP	HYDRANTS USED	MAIN SIZE
☑ Static / Residual & Flow Hydrants	☑ City Hydrant(s)	City: 10" Main
☐ Flow Direction (if the main is dead end)	☐ Site Hydrant(s)	Site:

SITE NOTES

CLASSIC FIRE + LIFE SAFETY

FLOW TEST REPORT

Form SD-003B RevDate: Nov 29, 2021

TEST INFORMATION			
Minimum Required Flow:	NA	Min Ports:	2
CFLS Personnel Present:		Test Date:	2025-06-26
City / External Company:	Norfolk County	Test Time:	1:00pm

TEST EQUIPMENT	
☐ Hose Monsters with built in Pitot	Hose length used:
☐ Hand held pitot gauge	☑ Pollard diffuser elbow with built in Pitot
☐ Other:	

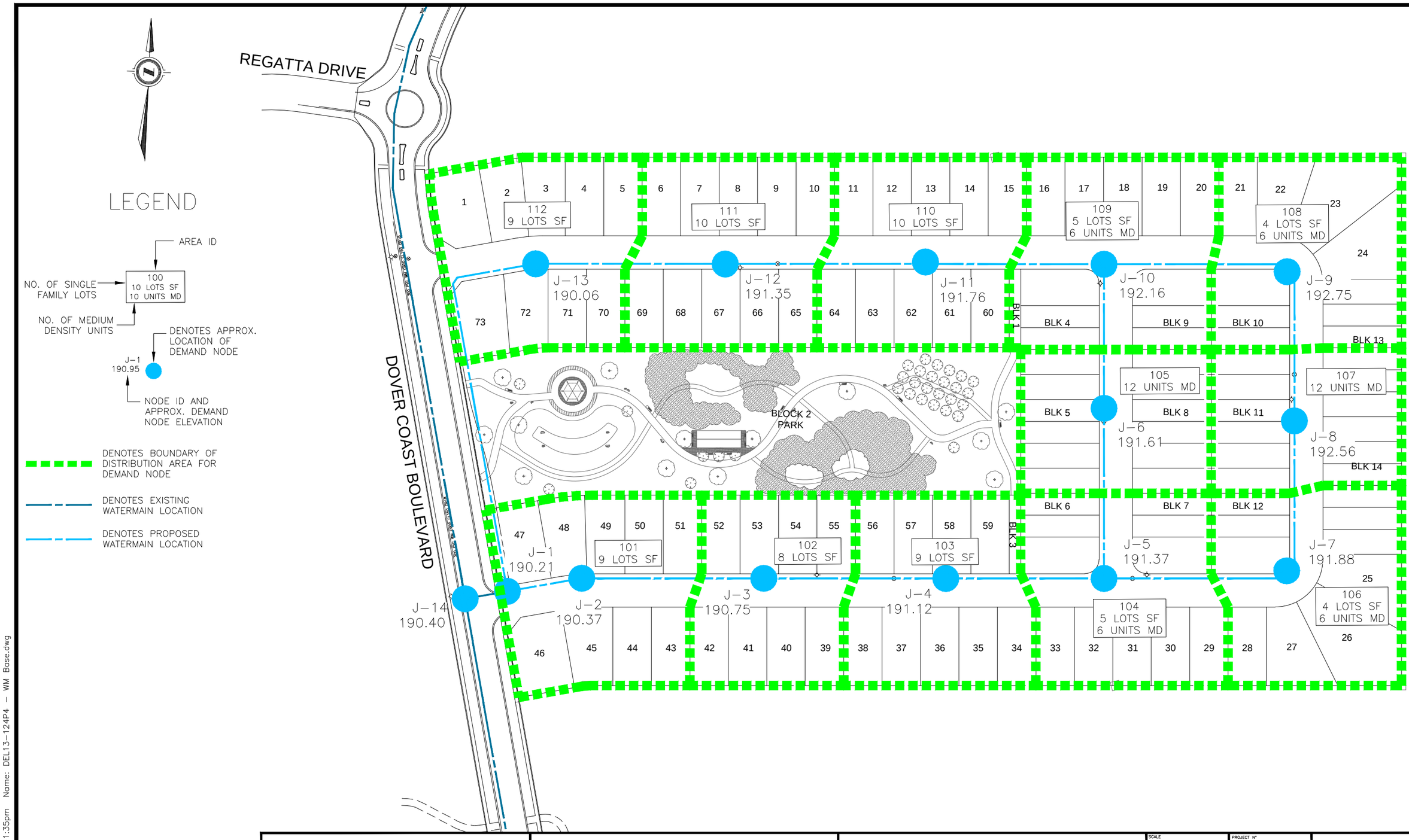
TEST RESULTS

Number of Ports	Outlet Size (IN)	Discharge Coefficient	Pitot Reading (PSI)				Total Flow (GPM)	Static / Residual Pressure (PSI)
0 Ports								60
1 Port	2.5	0.9	35				993	55
2 Ports	2.5	0.9	20	20			1,501	50
3 Ports	2.5	0.9					0	
4 Ports	2.5	0.9					0	
0 Ports	**STATIC RE-CHECK**							60

TEST NOTES

HYDRAULIC ADJUSTMENTS (FOR OFFICE USE ONLY)			
ADJUSTMENTS FOR HYDRAULIC GRADE LINE (HGL)			
Reservoir HGL (m):		Site Elevation (m):	
Theoretical Static Head (PSI):	0	PSI to subtract from test pressures:	60
OTHER HYDRAULIC ADJUSTMENTS			
Other adjustment as required by the City / AHJ:			

Appendix B: Water Figures and Calculations



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e-mail: deveng@deveng.net

development engineering (London) Limited
CONSULTING CIVIL ENGINEERS

DOVER COAST PHASE 4

WATER DISTRIBUTION PLAN

SCALE: 1:1500

PROJECT N°: DEL13-124P4

DRAWN BY: TW

DATE: JULY 2025

Figure Number
1.0

Plotted: Jul.17/25 - 1:35pm Name: DEL13-124P4 - WM Base.dwg

development engineering (London) Limited
CONSULTING CIVIL ENGINEERS

DEL13-124P4: Dover Coast Phase 4
Water Demands Calculations

Date: July 2025
Prepared by: Troy Winger, E.I.T.
Checked by: Derek Hoevenaars, P.Eng.

AREA ID	Single-Family Residential			Medium-Density Residential			Demand Summary				Demand Node
	# of Units*	Population	Average Day Demand (L/s)	# of Units*	Population	Average Day Demand (L/s)	Average Day Demand (L/s)	Max Day Demand (L/s)	Peak Hour Demand (L/s)	Fire Flow (L/s)	
101	9	27	0.089	0	0	0.000	0.089	0.200	0.356	85	J-2
102	8	24	0.079	0	0	0.000	0.079	0.178	0.317	85	J-3
103	9	27	0.089	0	0	0.000	0.089	0.200	0.356	85	J-4
104	5	15	0.049	6	14	0.048	0.097	0.218	0.388	150	J-5
105	0	0	0.000	12	29	0.095	0.095	0.214	0.381	150	J-6
106	4	12	0.040	6	14	0.048	0.088	0.198	0.352	150	J-7
107	0	0	0.000	12	29	0.095	0.095	0.214	0.381	150	J-8
108	4	12	0.040	6	14	0.048	0.088	0.198	0.352	150	J-9
109	5	15	0.049	6	14	0.048	0.097	0.218	0.388	150	J-10
110	10	30	0.099	0	0	0.000	0.099	0.223	0.396	85	J-11
111	10	30	0.099	0	0	0.000	0.099	0.223	0.396	85	J-12
112	9	27	0.089	0	0	0.000	0.089	0.200	0.356	85	J-13
Totals:	**73**	**219**	**0.72**	**48**	**115**	**0.38**	**1.11**	**2.49**	**4.42**		

**Number of units is based on Concept Plan by Blackthorn Development Corp. dated March 25, 2025.*

Assumptions:

Demands[2]*:*

Water Demands	285	L/capita/day

Population Densities[2]*:*

Low Density	3.0	people/unit
Medium Density	2.4	people/unit

Fire Flow Requirements[2]*:*

Low Density	85	L/s
Medium Density	150	L/s

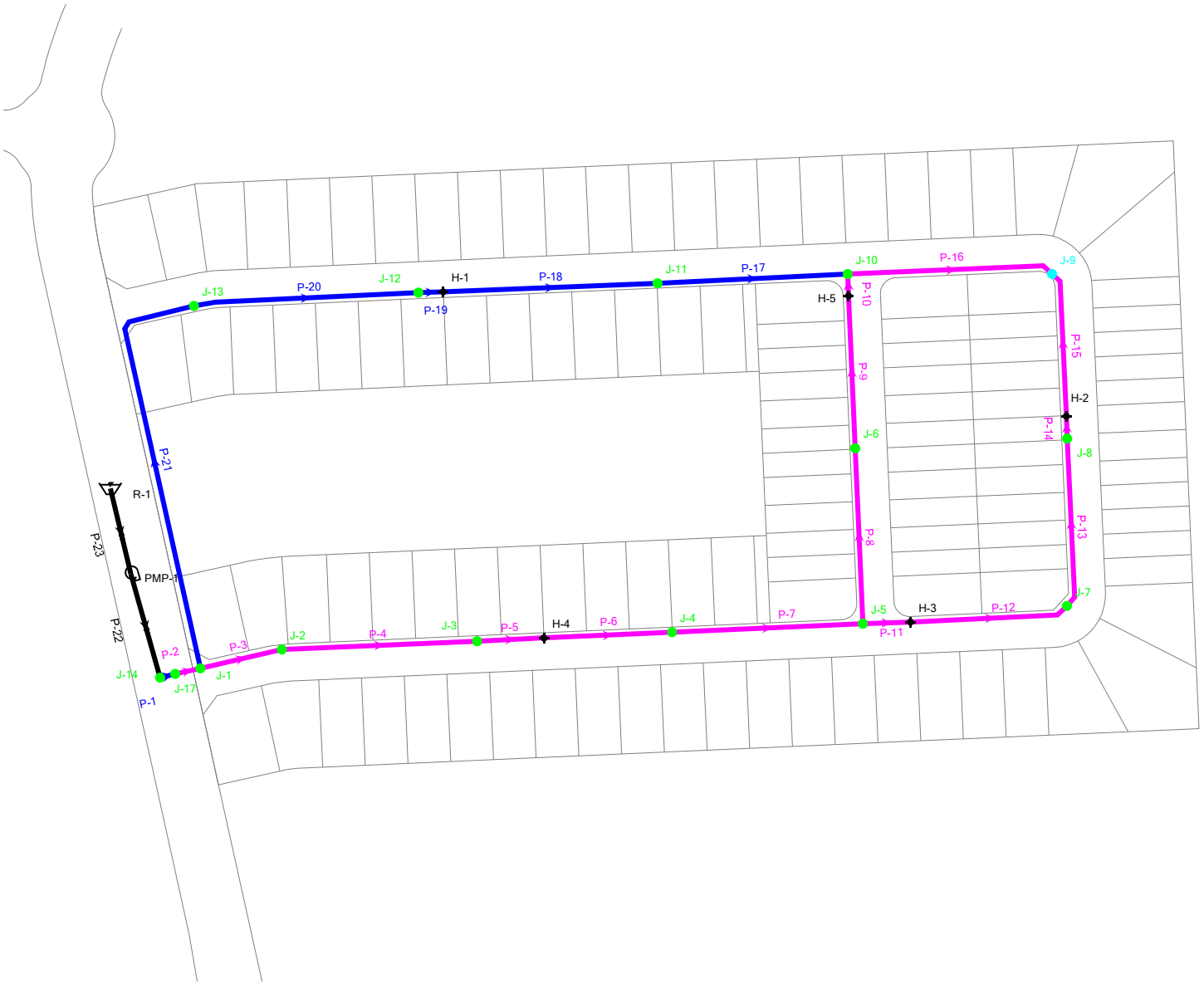
Peaking Factors[1]*:*

Maximum Day	2.25
Peak Hour	4

(1) *Assumptions are based on Design Requirements outlined in Norfolk County Design Criteria (February 2019)*
(2) *Assumption is based Norfolk County's change to Development Standards/Guidelines dated November 28, 2024.*

Appendix C: WaterCAD Modeling Results – Ultimate Build-out

Scenario: Average Day
Active Scenario: Average Day



Color Coding Legend

Pipe: Diameter (mm)

<=	150.0
<=	200.0
<=	250.0
<=	300.0
	Other

Color Coding Legend

Junction: Age (Maximum) (hours)

<=	24.000
<=	48.000
<=	72.000
	Other

FlexTable: Junction Table

Active Scenario: Average Day

Current Time: 336.00 hours

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)	Age (Maximum) (hours)
J-1	190.21	0.000	233.18	421	0.421
J-2	190.31	0.089	233.18	420	0.996
J-3	190.70	0.079	233.18	416	2.523
J-4	191.08	0.089	233.18	412	4.255
J-5	191.46	0.097	233.18	408	6.259
J-6	191.56	0.095	233.18	407	10.824
J-7	191.92	0.088	233.18	404	11.707
J-8	192.57	0.095	233.18	397	19.808
J-9	192.67	0.088	233.18	396	42.043
J-10	192.26	0.097	233.18	400	20.098
J-11	191.83	0.099	233.18	405	11.809
J-12	191.40	0.099	233.18	409	7.113
J-13	190.97	0.089	233.18	413	4.334
J-14	190.40	0.000	233.18	419	0.200
J-17	190.31	0.000	233.18	420	0.300

FlexTable: Pipe Table

Active Scenario: Average Day

Current Time: 336.00 hours

Label	Length (m)	Minor Loss Coefficient (Local)	Diameter (mm)	Material	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Age (Maximum) (hours)
P-1	6	0.000	200.0	PVC	110.0	-1.104	0.04	0.200
P-2	10	0.000	250.0	PVC	110.0	-1.104	0.02	0.317
P-3	32	0.000	250.0	PVC	110.0	-0.748	0.02	0.660
P-4	74	0.000	250.0	PVC	110.0	-0.659	0.01	1.710
P-5	25	0.000	250.0	PVC	110.0	-0.580	0.01	2.770
P-6	48	0.000	250.0	PVC	110.0	-0.580	0.01	3.637
P-7	72	0.000	250.0	PVC	110.0	-0.491	0.01	5.207
P-8	66	0.000	250.0	PVC	110.0	0.198	0.00	8.492
P-9	58	0.000	250.0	PVC	110.0	0.103	0.00	14.592
P-10	8	0.000	250.0	PVC	110.0	0.103	0.00	18.955
P-11	18	0.000	250.0	PVC	110.0	-0.196	0.00	6.834
P-12	60	0.000	250.0	PVC	110.0	-0.196	0.00	9.557
P-13	64	0.000	250.0	PVC	110.0	-0.108	0.00	15.708
P-14	8	0.000	250.0	PVC	110.0	-0.013	0.00	24.120
P-15	55	0.000	250.0	PVC	110.0	-0.013	0.00	56.763
P-16	78	0.000	250.0	PVC	110.0	0.075	0.00	27.203
P-17	72	0.000	200.0	PVC	110.0	0.069	0.00	16.313
P-18	81	0.000	200.0	PVC	110.0	0.168	0.01	9.655
P-19	9	0.000	200.0	PVC	110.0	0.168	0.01	7.308
P-20	85	0.000	200.0	PVC	110.0	0.267	0.01	5.674
P-21	160	0.000	200.0	PVC	110.0	0.356	0.01	2.327

Fire Flow Node FlexTable: Fire Flow Results Table

Active Scenario: Max Day + Fire Flow

Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Pressure (Calculated Residual @ Total Flow Needed) (kPa)	Junction w/ Minimum Pressure (System)	Pressure (Calculated System Lower Limit) (kPa)	Pipe w/ Maximum Velocity	Velocity of Maximum Pipe (m/s)	Fire Flow (Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)
H-1	True	85.000	308	J-12	311	P-1	2.82	86.000	140	306
H-2	True	150.000	140	J-8	143	P-1	4.86	150.047	140	140
H-3	True	150.000	164	H-2	153	P-1	4.89	151.000	140	161
H-4	True	85.000	337	H-2	318	P-1	2.82	86.000	140	335
H-5	True	150.000	156	J-9	152	P-1	4.89	151.000	140	153

FlexTable: Junction Table

Active Scenario: Peak Hour

Current Time: 336.00 hours

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)	Age (Maximum) (hours)
J-1	190.21	0.000	233.15	420	0.400
J-2	190.31	0.356	233.15	419	0.544
J-3	190.70	0.316	233.15	415	0.925
J-4	191.08	0.356	233.15	412	1.359
J-5	191.46	0.388	233.15	408	1.860
J-6	191.56	0.380	233.15	407	3.001
J-7	191.92	0.352	233.15	403	3.222
J-8	192.57	0.380	233.15	397	5.247
J-9	192.67	0.352	233.15	396	10.806
J-10	192.26	0.388	233.15	400	5.319
J-11	191.83	0.396	233.15	404	3.247
J-12	191.40	0.396	233.15	409	2.073
J-13	190.97	0.356	233.15	413	1.378
J-14	190.40	0.000	233.16	418	0.200
J-17	190.31	0.000	233.15	419	0.300

FlexTable: Pipe Table

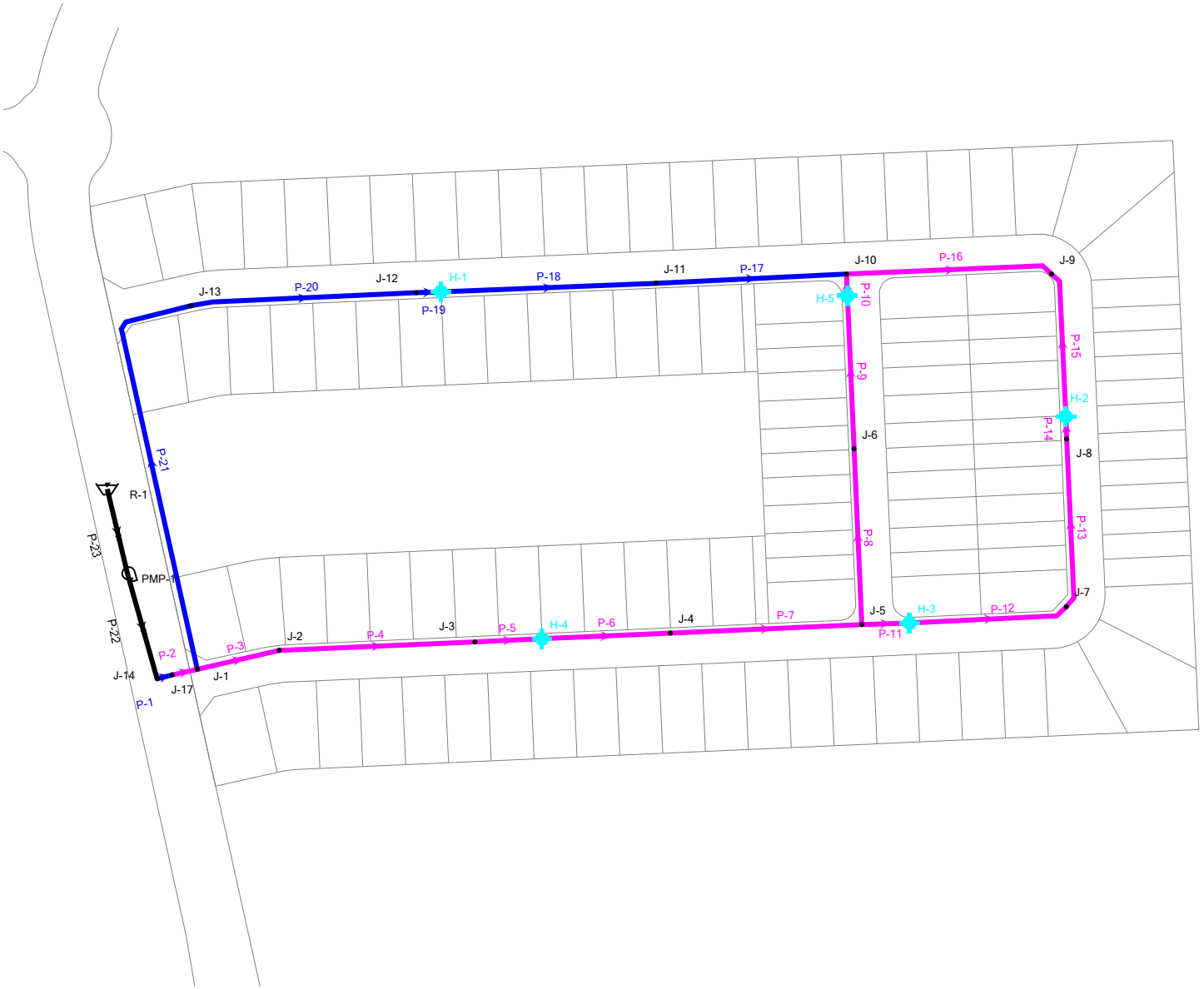
Active Scenario: Peak Hour

Current Time: 336.00 hours

Label	Length (m)	Minor Loss Coefficient (Local)	Diameter (mm)	Material	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Age (Maximum) (hours)
P-1	6	0.000	200.0	PVC	110.0	-4.416	0.14	0.200
P-2	10	0.000	250.0	PVC	110.0	-4.416	0.09	0.300
P-3	32	0.000	250.0	PVC	110.0	-2.992	0.06	0.431
P-4	74	0.000	250.0	PVC	110.0	-2.636	0.05	0.687
P-5	25	0.000	250.0	PVC	110.0	-2.320	0.05	0.958
P-6	48	0.000	250.0	PVC	110.0	-2.320	0.05	1.169
P-7	72	0.000	250.0	PVC	110.0	-1.964	0.04	1.559
P-8	66	0.000	250.0	PVC	110.0	0.791	0.02	2.381
P-9	58	0.000	250.0	PVC	110.0	0.411	0.01	3.906
P-10	8	0.000	250.0	PVC	110.0	0.411	0.01	5.000
P-11	18	0.000	250.0	PVC	110.0	-0.785	0.02	1.967
P-12	60	0.000	250.0	PVC	110.0	-0.785	0.02	2.648
P-13	64	0.000	250.0	PVC	110.0	-0.433	0.01	4.185
P-14	8	0.000	250.0	PVC	110.0	-0.053	0.00	6.288
P-15	55	0.000	250.0	PVC	110.0	-0.053	0.00	14.448
P-16	78	0.000	250.0	PVC	110.0	0.299	0.01	7.058
P-17	72	0.000	200.0	PVC	110.0	0.276	0.01	4.336
P-18	81	0.000	200.0	PVC	110.0	0.672	0.02	2.672
P-19	9	0.000	200.0	PVC	110.0	0.672	0.02	2.091
P-20	85	0.000	200.0	PVC	110.0	1.068	0.03	1.676
P-21	160	0.000	200.0	PVC	110.0	1.424	0.05	0.840

Appendix D: WaterCAD Modeling Results – Hydrant Colour Coding

Scenario: Hydrant Colour Coding
Active Scenario: Hydrant Colour Coding



Color Coding Legend

Pipe: Diameter (mm)

	<=	150.0
	<=	200.0
	<=	250.0
	<=	300.0
		Other

Color Coding Legend

Hydrant: Fire Flow (Available) (L/s)

	<=	31.67
	<=	63.00
	<=	94.58
		Other

Fire Flow Node FlexTable: Fire Flow Results Table

Active Scenario: Hydrant Colour Coding

Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Pressure (Calculated Residual @ Total Flow Needed) (kPa)	Junction w/ Minimum Pressure (System)	Pressure (Calculated System Lower Limit) (kPa)	Pipe w/ Maximum Velocity	Velocity of Maximum Pipe (m/s)	Fire Flow (Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)
H-1	True	85.000	308	J-12	147	P-1	4.78	147.807	140	140
H-2	True	150.000	140	J-8	143	P-1	4.86	150.047	140	140
H-3	True	150.000	164	H-2	140	P-1	5.02	155.308	140	148
H-4	True	85.000	337	H-2	140	P-1	5.36	166.044	140	154
H-5	True	150.000	156	J-9	140	P-1	5.01	154.971	140	141

MAP A

CONTEXT MAP

Geographic Township of WOODHOUSE

28TPL2025332
28CDPL2025331

Legend

Subject Lands

2020 Air Photo

1/9/2026

N

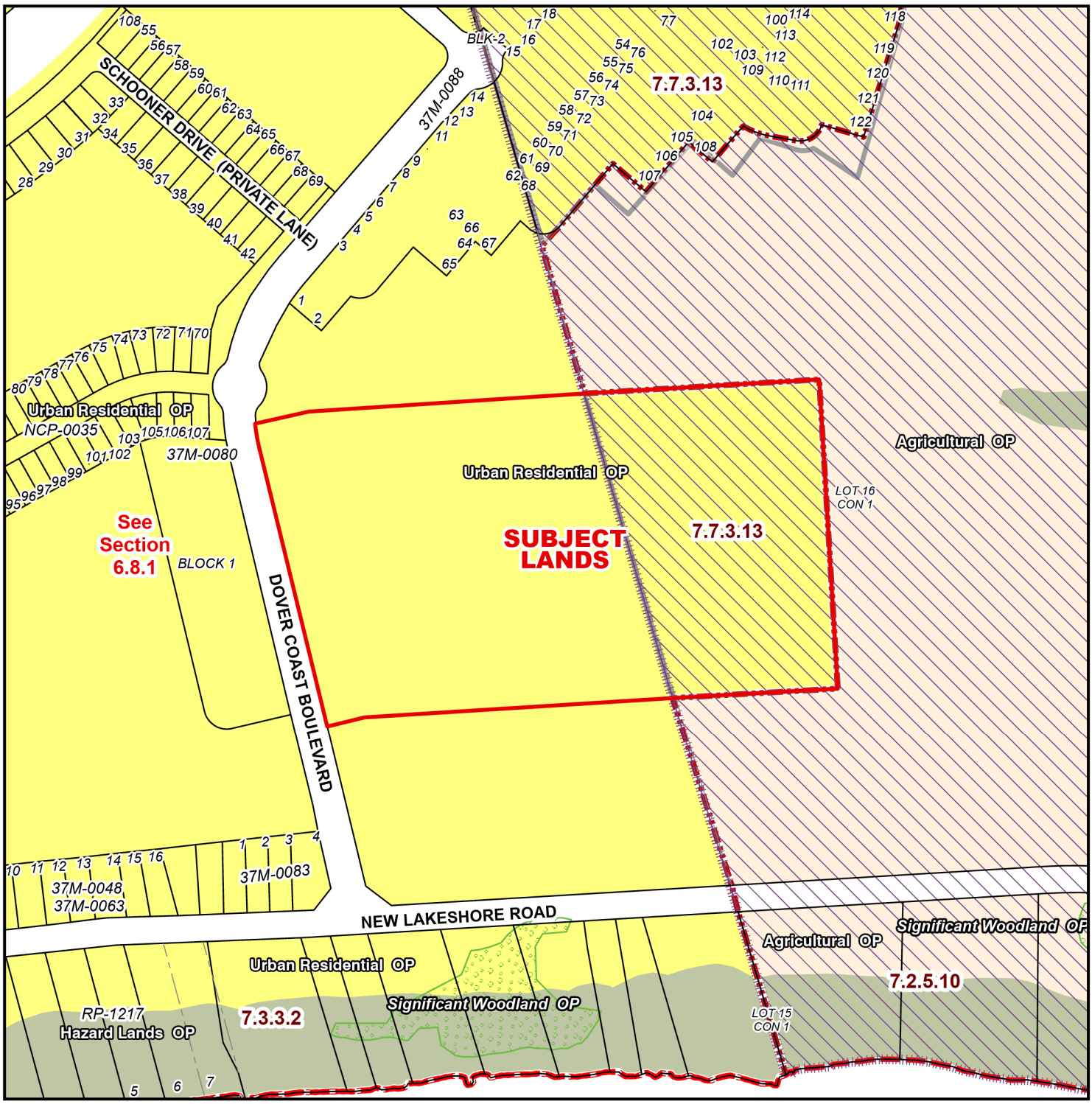
30 15 0 30 60 90 120
Meters

MAP B

OFFICIAL PLAN MAP

Geographic Township of WOODHOUSE

28TPL2025332
28CDPL2025331



Legend

Subject Lands

Official Plan Designations

- Agricultural
- Hazard Lands
- Urban Residential
- Special Policy Area
- Urban Area Boundary
- Significant Woodland
- Industrial Influence

1/9/2026

N

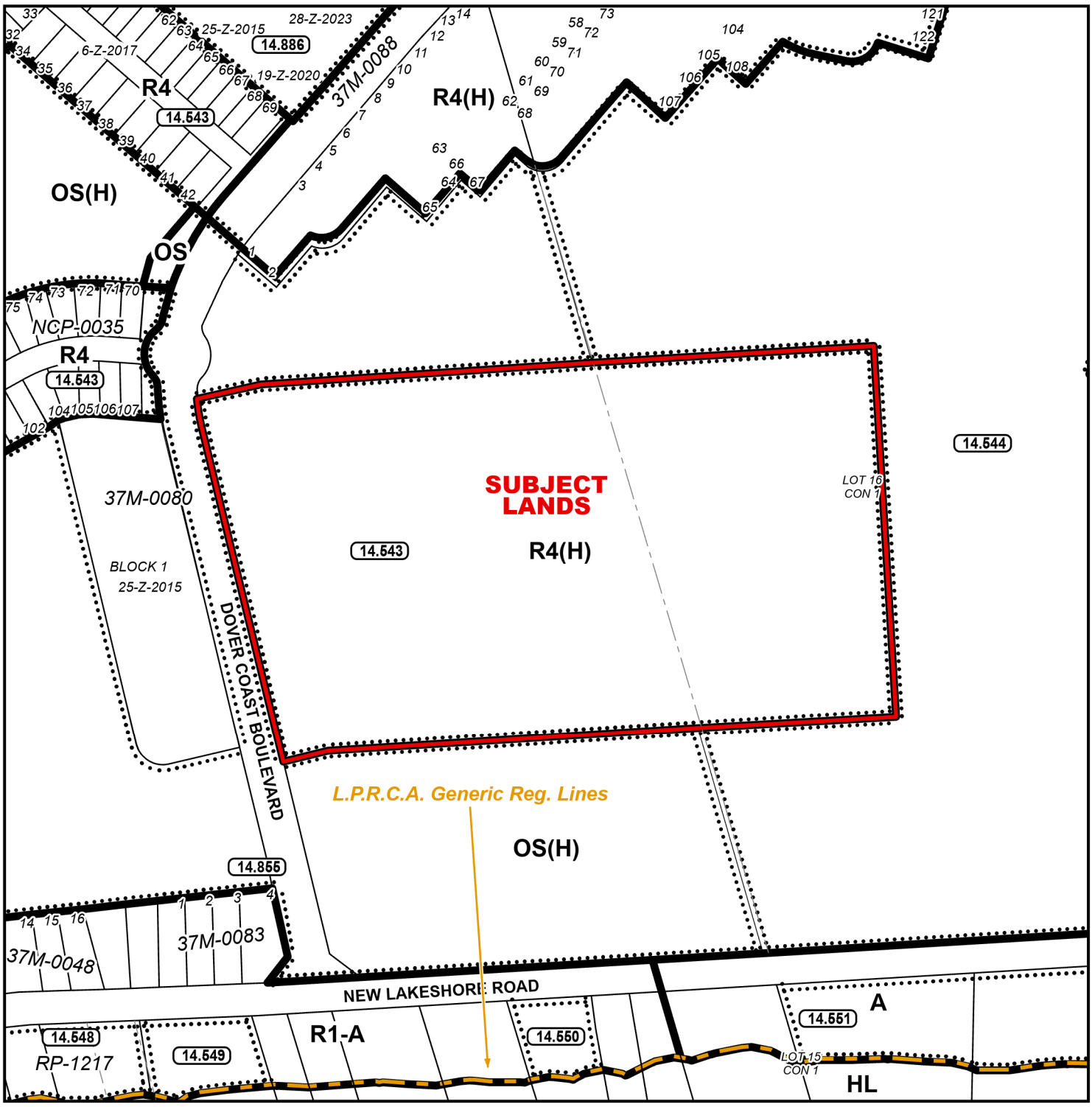
30 15 0 30 60 90 120 Meters

MAP C

ZONING BY-LAW MAP

Geographic Township of WOODHOUSE

28TPL2025332
28CDPL2025331



ZONING BY-LAW 1-Z-2014

1/9/2026

LEGEND

- Subject Lands
- LPRCA Generic RegLines

(H) - Holding

A - Agricultural Zone

HL - Hazard Land Zone

OS - Open Space Zone

R1-A - Residential R1-A Zone

R4 - Residential R4 Zone

R5 - Residential R5 Zone

N

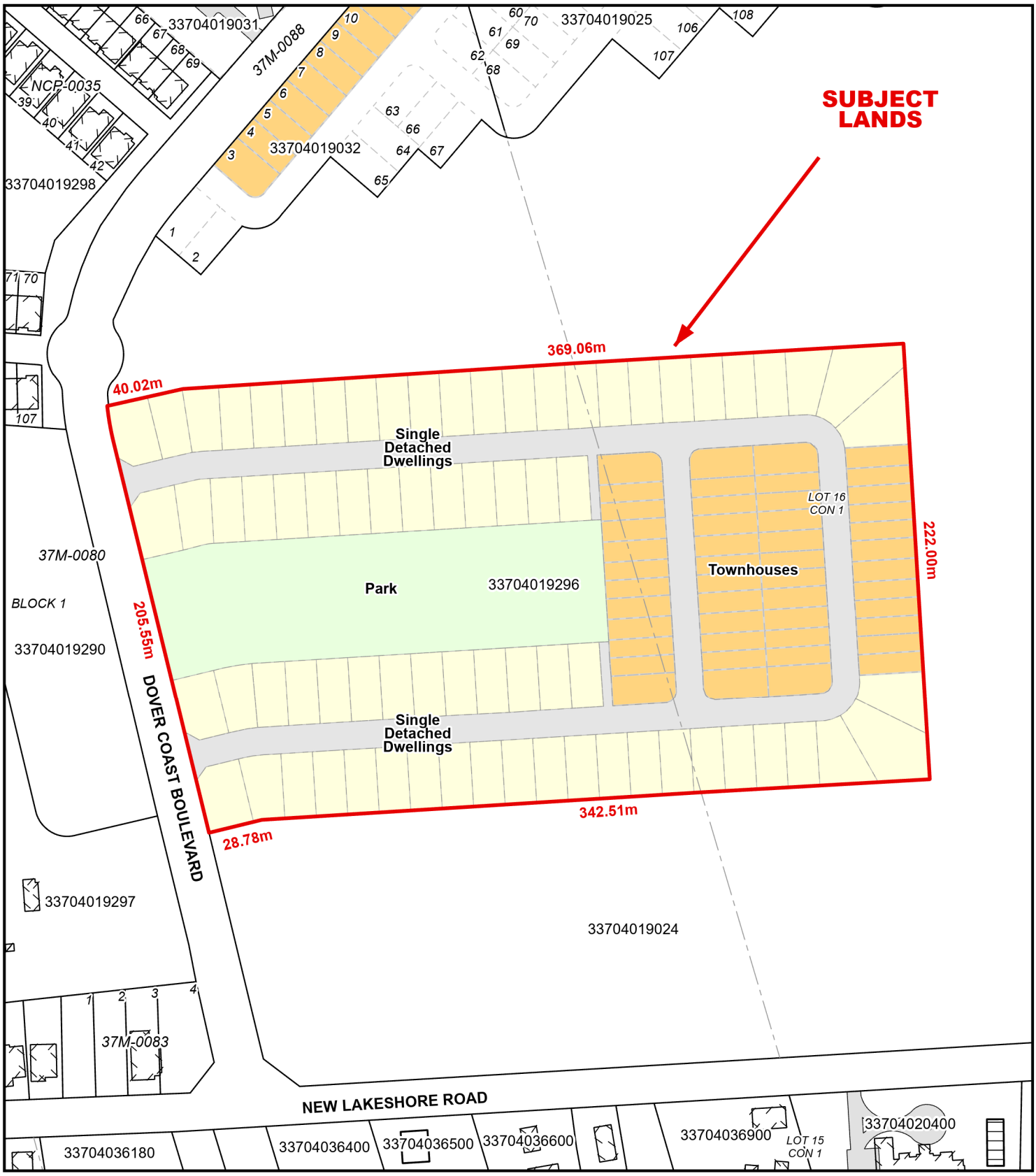
25 12.5 0 25 50 75 100 Meters

MAP D

CONCEPTUAL PLAN

Geographic Township of WOODHOUSE

28TPL2025332
28CDPL2025331



Legend

- Subject Lands
- Proposed Lots By Type
  - Single Family Dwelling
  - Multi Family Dwellings
- Park
- Storm Water Pond
- Other

1/9/2026

N

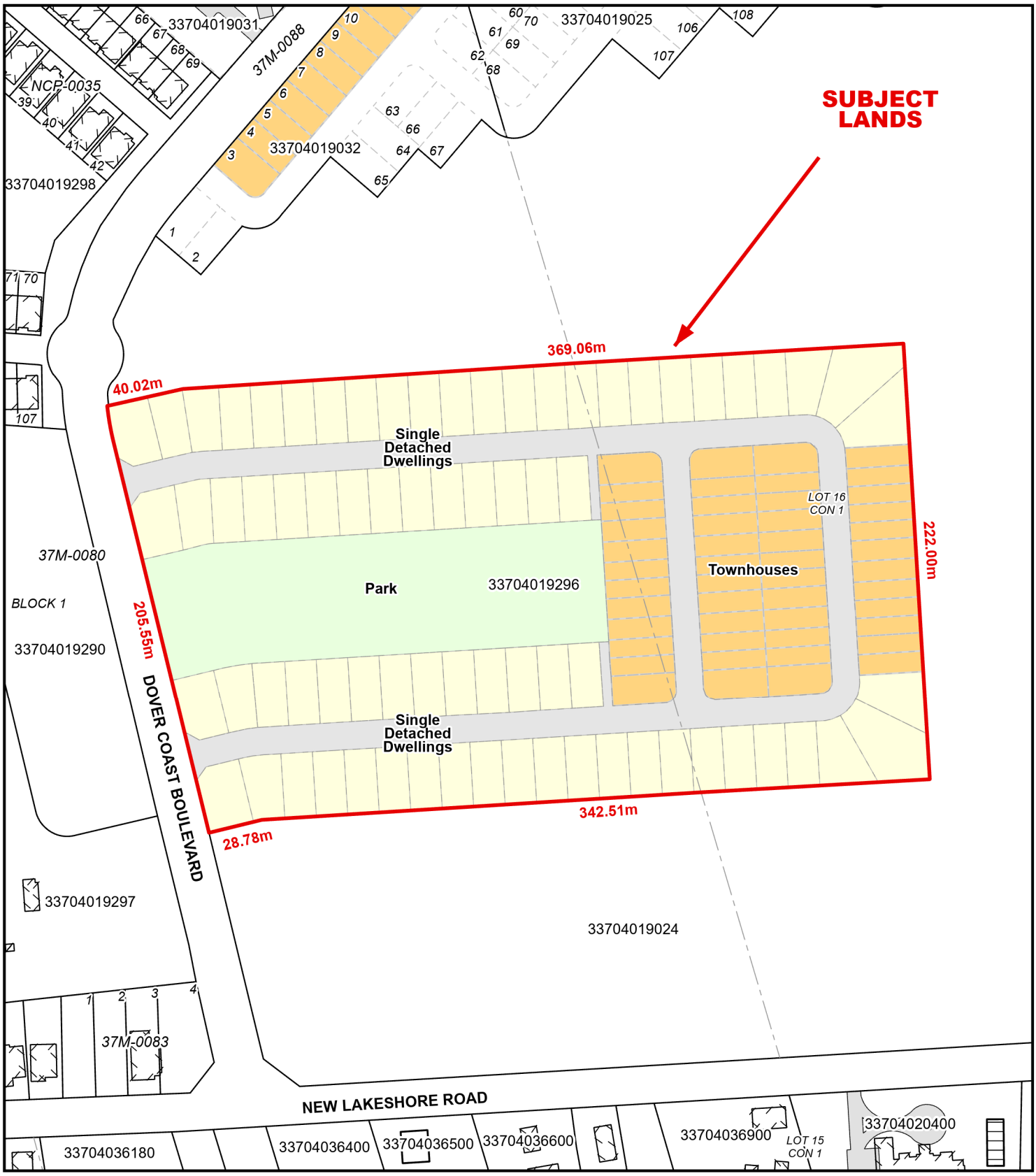
20 10 0 20 40 60 80 Meters

LOCATION OF LANDS AFFECTED

CONCEPTUAL PLAN

Geographic Township of WOODHOUSE

28TPL2025332
28CDPL2025331



1/9/2026

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