**PLANNING
URBAN DESIGN
& LANDSCAPE
ARCHITECTURE**

August 3, 2023

Planning Department   (sent via email to planning@norfolkcounty.ca)
Norfolk County
185 Robinson Street, Suite 200
Simcoe, ON N3Y 5L6

**RE: Site Plan Application
          66-80 Norfolk Street South, Simcoe
          OUR FILE 19129H**

On behalf of our client, Crescent Haven Homes, we are pleased to submit the enclosed Site Plan application for the lands municipally addressed as 66-80 Norfolk Street South, Simcoe (hereinafter referred to as "the subject lands" or "the site").

The subject lands were previously occupied by a garden centre, and currently contain commercial/office uses within a residential building. The subject lands are within the downtown area of Simcoe, and are designated Downtown within the Norfolk County Official Plan. The subject lands are zoned Central Business District (CBD) in the Norfolk County Zoning By-law 1-Z-2014, and a range of uses are permitted, including the proposed mixed-use development (provided a minimum of 50% of the ground level is used for commercial purposes).

The proposed development consists of a six-storey mixed use building with 373.3 m² of ground-level commercial space and 103 residential units in the form of one and two-bedroom units. The proposed building has been designed to provide ground-level commercial uses along the frontage of Norfolk Street South to activate the pedestrian streetscape, with residential units in the floors above. The proposed unique building design cantilevers the rear "L" shaped portion of the building from floors 2-6 to ensure residential uses are proposed above the ground level. This design also allows for the proposed 95 parking spaces to be provided in a mix in surface, covered (under cantilevered portion of building) and underground forms. A ground-level common amenity area is provided for all residents, as well as private balconies for all units. Access to the ground floor amenity and lobby areas are provided from both the sidewalk on Norfolk Street South and from the rear of the building.

The site is a through lot, and has frontage on both Norfolk Street South and Kent Street South. In order to animate the streetscape on Norfolk Street, vehicular access to the site is proposed from Kent Street. The vehicular access and proposed parking is internalized and located behind the building mass that is oriented to Norfolk Street South. The majority of the proposed parking is underground,

and is accessed by a ramp that is immediately straight off of the driveway access from Kent Street. The loading area for the move-in room, service areas and garbage pick-up room is accessed from Kent Street, and is located at the end of the central parking aisle in order to keep the underground parking ramp and covered parking spaces unobstructed. A total of 95 parking spaces are proposed. While the zoning by-law does not have a minimum parking rate for the CDB zone, the proposed development provides for a parking ratio of almost 1 parking space per unit, which we believe is appropriate given the location of the proposed development within the downtown core.

The proposed development has been designed to complement the architecture of the existing commercial storefronts and mixed-use buildings in the downtown. The use of pre-cast brick and stone for the podium and throughout the majority of the proposed building will allow for the proposed development to appropriately integrate amongst the existing buildings and facades on Norfolk Street South that are similarly composed of bricks in contrasting colours. Furthermore, the proposed four-storey podium is of an appropriate height to maintain the rhythm and design of the existing downtown core.

In support of this application please find enclosed a digital copy of the following:

- A fully completed Planning Department Development Application Form;
- A Site Plan, prepared by MHBC Planning;
- Elevation Drawings, prepared and stamped by ABA Architects;
- Removals and Erosion & Sediment Control Plan (C1-1), prepared by WalterFedy;
- Grading Plan (C2-1), prepared by WalterFedy;
- Servicing Plan (C3-1), prepared by WalterFedy; and,
- Functional Servicing and Stormwater Management Report, prepared by WalterFedy.

In discussions with Tricia Givens, Director of Planning, it was confirmed that the Record of Site Condition (RSC) is not required for submission, but will be a condition of approval. We have also been advised that the HIA can be waived, provided the applicant can share some information on how the proposed building façade, materials and overall design fit into the downtown core. This additional information is provided in an earlier section of this letter.

We also ask the staff proceed to review the proposed site plan in advance of the preparation of landscape and lighting plans. We propose that the lighting and landscape plans be prepared and submitted to the County for review once County staff are in support of the site plan design, in an effort to avoid unnecessary duplication of work.

The cheque for the site plan application fee in the amount of $10,857.00 will be delivered to the County under separate cover.

We look forward to working with County staff on this application. Kindly acknowledge receipt of this application and confirm the planner assigned. Should you have any questions please do not hesitate to contact the undersigned.

Yours truly,
MHBC

David W. Aston, MSc, MCIP, RPP
Partner / Vice President

Cc: Nitin Jain
        Stephan Yaworski
        Tricia Givens

Planning Department Development Application Form

Complete Application

A complete development application consists of the following:

1. A properly completed and signed application form (signature must be original in planners file);
2. Supporting information adequate to illustrate your proposal as indicated in **Section H** of this application form (plans are required in paper copy and digital PDF format);
3. Written authorization from the registered owner of the subject lands where the applicant is not the owner as per Section N; and,
4. Cash, debit or cheque payable to Norfolk County in the amount set out in the user fees By-Law.

The above information is required to ensure that your application is given full consideration. An incomplete or improperly prepared application will not be accepted and may result in delays during the processing of the application. This application must be typed or printed in ink and completed in full.

Pre-Submission Consultation "Pre-consultation":

A pre-consultation meeting with staff is required for all applications; however, minor applications may be exempted depending on the nature of the proposal, with approval from the Director of Planning or delegate. 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 County and Agency staff to identify the required information and materials to be submitted with the application in order for it to be considered complete. The applicant has the opportunity to make revisions to the application prior to submission, without the additional costs of recirculation fees. It may be necessary to seek the assistance of independent professional help (for example, a planning consultant or engineer) for complex applications. If a pre-consultation meeting has been held to discuss your development, please **include a copy of the Pre-consultation minutes with your application** as part of the submission package. It should be noted **that pre-consultation minutes are valid for one year after the meeting date**.

Development Application Process

Once an application has been deemed complete by a planner, it will be circulated to public agencies and County departments for review and comments. Notice of the application is also provided to adjacent land owners. The comments received assist the planner with the review and recommendation/approval of your application. The time involved in processing an application varies depending upon its complexity and its

acceptability to the other agencies and is subject to statutory *Planning Act* decision timeframes.

An additional fee will be required if a review by the Long Point Region Conservation Authority or by the Grand River Conservation Authority is deemed necessary by planning staff and/or by the Authority. A separate cheque payable to the Long Point Region Conservation Authority or the Grand River Conservation Authority is required in accordance with their fee schedule at the same time your application is submitted.

Additional studies required as part of the complete application shall be at the sole expense of the applicant. It should also be noted that in some instances peer reviews may be necessary to review particular studies and that the cost shall be at the expense of the applicant. The company to complete the peer review shall be selected by the County.

If the application is withdrawn prior to the circulation to commenting agencies, the entire original fee will be refunded. If withdrawn after the circulation to agencies, half the original fee will be refunded. If your drawings are required to be recirculated there will be an additional fee. Also, please note that if your engineering drawings require more than three reviews due to revisions by the owner or failure to revise your engineering drawings as requested, an additional fee will be charged. No refund is available after the public meeting and/or after approval of application.

Notification Sign Requirements

For the purpose of public notification and in order for staff to locate your lands for appropriate applications (zoning, subdivision, condominium or official plan) you will be given 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, not on a tree;
3. Notify the Planner when the sign is in place in order to avoid processing delays; and
4. Maintain the sign until the development application is finalized and thereafter removed.

Contact Us

For additional information or assistance in 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.

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

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

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

Proposed site plan application for the development of a 6 storey mixed use building. Commercial unit(s) proposed at the ground

level fronting Norfolk Street South, with residential units on 2nd to 6th storeys. A mix of surface and underground parking

is proposed, with parking access proposed from Kent Street South.

Property Assessment Roll Number: 40101113300

A. Applicant Information

Name of Owner   Crescent Haven Homes

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

Address	180 Frobisher Drive, Unit #3
Town and Postal Code	Waterloo ON, N2V 2A2
Phone Number	647-523-6487
Cell Number	
Email	nitin@crescenthomes.ca

Name of Applicant	Same as agent
Address	
Town and Postal Code	
Phone Number	
Cell Number	
Email	

Name of Agent	MHBC Planning Ltd. c/o Dave Aston
Address	540 Bingemans Centre Drive, Suite 200
Town and Postal Code	Kitchener ON, N2B 3X9
Phone Number	519-576-3650
Cell Number	
Email	daston@mhbcplan.com

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

☐ Owner   ■ Agent   ☐ Applicant

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

B. Location, Legal Description and Property Information

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

PLAN 182 BLK 103 LOTS 11 AND 1, PT LOTS 7 8 AND 14 AND RP 37R1373 PARTS 1 TO 6

Municipal Civic Address: 66 and 80 Norfolk Street South

Present Official Plan Designation(s): Downtown

Present Zoning: Central Business District (CBD)

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

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

3. Present use of the subject lands:
   Vacant (former garden centre), existing commerial/office use in a dwelling.

4. Please describe **all existing** buildings or structures on the subject lands and whether they are to be retained, demolished or removed. If retaining the buildings or structures, please describe the type of buildings or structures, and illustrate the setback, in metric units, from front, rear and side lot lines, ground floor area, gross floor area, lot coverage, number of storeys, width, length, and height on your attached sketch which must be included with your application:
   Existing structure at 80 Norfolk Street South to be demolished to accommodate proposed development.

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.

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:
   Proposed building is a 6-storey mixed-use building with ground floor commercial, and residential units
   on the 2nd to 6th floors. Please refer to submitted site plan for setback and floor area details.

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

   If yes, identify and provide details of the building:

   _____

   _____

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

   Unknown
   _____

9. Existing use of abutting properties:

   Commercial/office, with residential above
   _____

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

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

    _____

C. Purpose of Development Application

Note: Please complete all that apply.

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

   The subject property is within an area that is subject to site plan control. As such, this site plan application for

   the proposed development is being submitted to the County for site plan control review.

   _____

   _____

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

   N/A - proposed development complies with the provisions of the Official Plan and 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: _____ N/A _____

Depth: _____ N/A _____

Width: _____ N/A _____

Lot Area: _____ N/A _____

Present Use: _____ N/A _____

Proposed Use: _____ N/A _____

Proposed final lot size (if boundary adjustment): N/A _____

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: _____ N/A _____

Depth: _____ N/A _____

Width: _____ N/A _____

Lot Area: _____ N/A _____

Present Use: _____ N/A _____

Proposed Use: _____ N/A _____

Buildings on retained land: N/A _____

7. Description of proposed right-of-way/easement:

Frontage: _____ N/A _____

Depth: _____ N/A _____

Width: _____ N/A _____

Area: _____ N/A _____

Proposed use: _____ N/A _____

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

_____

9. Site Information

Please indicate unit of measurement, for example: m, m² or %

	Zoning	Proposed
Lot frontage	-	61 m (approx)
Lot depth	-	78 m (approx)
Lot width	-	61 m (approx)
Lot area	-	4,471.2 m2
Lot coverage	80% (max)	41.8%
Front yard	0 m	4.15 m
Rear yard	0 m	> 0 m
Left Interior side yard	0 m	> 0 m
Right Interior side yard	0 m	> 0 m
Exterior side yard (corner lot)	-	-
Landscaped open space	-	743.7 m2
Entrance access width	-	7.5 m
Exit access width	-	7.5 m
Size of fencing or screening	-	-
Type of fencing	-	-

10. Building Size

	Zoning	Proposed
Number of storeys	6 storeys	6 storeys
Building height	-	21.7 m
Total ground floor area	-	1,013.5 m2
Total gross floor area	-	13,742.8 m2
Total useable floor area	-	

11. Off Street Parking and Loading Facilities

	Zoning	Proposed
Number of off street parking spaces	None required	95 spaces (total)
Number of visitor parking spaces	None required	
Number of accessible parking spaces	None required	4 spaces
Number of off street loading facilities	None required	

12. Residential (if applicable)

Number of buildings existing: 0

Number of buildings proposed: 1

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

If yes, describe: _____

Type	Number of Units	Floor Area per Unit in m2
Single Detached		
Semi-Detached		
Duplex		
Triplex		
Four-plex		
Street Townhouse		
Stacked Townhouse		
Apartment - Bachelor		
Apartment - One bedroom	76	64.5 m2 - 85.6 m2
Apartment - Two bedroom	27	74.6 m2 - 124.9 m2
Apartment - Three bedroom		

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

13. Commercial/Industrial Uses (if applicable)

Number of buildings existing: 1

Number of buildings proposed: 1 (proposed building to be mixed-use)

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

If yes, describe:

_____

Indicate the gross floor area by the type of use (for example: office, retail, or storage):
Commercial - 373.3 m2

_____

_____

Seating Capacity (for assembly halls or similar): N/A

Total number of fixed seats: N/A

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

Total number of staff proposed initially: N/A

Total number of staff proposed in five years: N/A

Maximum number of staff on the largest shift: N/A

Is open storage required: ☐ Yes ■ No

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

☐ Yes ■ No If yes please describe:

14. Institutional (if applicable)

Describe the type of use proposed: N/A

Seating capacity (if applicable): N/A

Number of beds (if applicable): N/A

Total number of staff proposed initially: N/A

Total number of staff proposed in five years: N/A

Maximum number of staff on the largest shift: N/A

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

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

N/A

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):
   Property was a former garden centre

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:
   Pre-consultation comments from County staff

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 requested in pre-consultation comments

E. Provincial Policy

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

   If no, please explain:

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

   If no, please explain:

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

If no, please explain:

_____

_____

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

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

Livestock facility or stockyard (submit MDS Calculation with application)
☐ On the subject lands or ☐ within 500 meters – distance _No_

Wooded area
☐ On the subject lands or ☐ within 500 meters – distance _No_

Municipal Landfill
☐ On the subject lands or ☐ within 500 meters – distance _No_

Sewage treatment plant or waste stabilization plant
☐ On the subject lands or ☐ within 500 meters – distance _No_

Provincially significant wetland (class 1, 2 or 3) or other environmental feature
☐ On the subject lands or ☐ within 500 meters – distance _No_

Floodplain
☐ On the subject lands or ☐ within 500 meters – distance _No_

Rehabilitated mine site
☐ On the subject lands or ☐ within 500 meters – distance _No_

Non-operating mine site within one kilometre
☐ On the subject lands or ☐ within 500 meters – distance _No_

Active mine site within one kilometre
☐ On the subject lands or ☐ within 500 meters – distance _No_

Industrial or commercial use (specify the use(s))
☐ On the subject lands or ■ within 500 meters – distance _Retail storefronts_

Active railway line
☐ On the subject lands or ☐ within 500 meters – distance _No_

Seasonal wetness of lands
☐ On the subject lands or ☐ within 500 meters – distance _No_

Erosion
☐ On the subject lands or ☐ within 500 meters – distance _No_

Abandoned gas wells
☐ On the subject lands or ☐ within 500 meters – distance _No_

F. Servicing and Access

1. Indicate what services are available or proposed:
   Water Supply
   - ☒ Municipal piped water
   - ☐ Individual wells
   - ☐ Communal wells
   - ☐ Other (describe below)

   _____

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

   _____

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

   _____

2. Existing or proposed access to subject lands:
   - ☒ Municipal road
   - ☐ Unopened road
   - ☐ Provincial highway
   - ☐ Other (describe below)

   Name of road/street: _____

G. Other Information

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

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

   _____
   _____
   _____
   _____

H. Supporting Material to be submitted by Applicant

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

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

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

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

☐ Zoning Deficiency Form

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

☐ Architectural Plan

☐ Buildings Elevation Plan

☐ Cut and Fill Plan

☐ Erosion and Sediment Control Plan

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

☐ Landscape Plan

☐ Photometric (Lighting) Plan

☐ Plan and Profile Drawings

☐ Site Servicing Plan

☐ Storm water Management Plan

☐ Street Sign and Traffic Plan

☐ Street Tree Planting Plan

☐ Tree Preservation Plan

☐ Archaeological Assessment

☐ Environmental Impact Study

☐ Functional Servicing Report

☐ Geotechnical Study / Hydrogeological Review

☐ Minimum Distance Separation Schedule

☐ Noise or Vibration Study

☐ Record of Site Condition

☐ Storm water Management Report

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

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

Standard condominium exemptions will require the following supporting materials:

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

☐ Draft condominium declaration

☐ Property Identification Number (PIN) printout

Your development approval might also be dependent on Ministry of Environment and Climate Change, Ministry of Transportation or other relevant federal or provincial legislation, municipal by-laws or other agency approvals.

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

I. Development Agreements

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

J. Transfers, Easements and Postponement of Interest

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

K. Permission to Enter Subject Lands

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

L. Freedom of Information

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

Nitin Jain   Digitally signed by Nitin Jain
Date: 2023.08.02 14:17:55 -04'00'

Owner/Applicant Signature	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 __Nitin Jain_____ am/are the registered owner(s) of the lands that is the subject of this application.

I/We authorize __MHBC Planning Ltd._____ 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.

Nitin Jain   Nitin

Owner	Date

Owner	Date

Norfolk COUNTY

N. Declaration

I,＿＿＿＿＿＿Luisa Vacondio＿＿＿＿＿＿of ＿＿City of Kitchener＿＿＿＿＿＿＿＿＿＿

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:

＿＿CITY OF KITCHENER＿＿＿＿＿＿＿＿

In ＿REGION OF WATERLOO＿＿＿＿＿＿

This ＿9＿ day of ＿AUGUST＿＿＿＿

A.D., 20 23

David/William Aston, a Commissioner, etc.,
Province of Ontario for MacNaughton Hermsen
A Commission Scheidson Planning Limited.
xpires January 9, 2026.

Luisa Vacondio

Owner/Applicant Signature

Norfolk
COUNTY

Legal Description

Pt Lt 7 & 8 Blk 103 Pl 182 Pt 1 Pl 37r10726; Norfolk County

Lt 8, 11, 13 Blk 103 Pl 182; Pt Lt 7, 14 Blk 103 Pl 182 As In Nr508552 Except Pt 3 37r2526; Norfolk County Subject To An Easement In Gross Over Pt 2 37r10732 As In Nk76852

Key Plan

Subject Site

Source: ESRI Basemap

Scale: NTS

SITE STATISTICS

Zoning By-law 1-Z-2014: Central Business District Zone (CBD)

	Required	Provided
Lot Area	-	4,471 m² (0.44 ha)
Unit Total	-	103
Building Area	-	1,013.5 m² (at grade)
Floor Area Ratio	-	2.3
Min. Front Yard	0 m	4.16 m (Norfolk St S)
Max. Front Yard	3.0 m	5.33m (Norfolk St S)
Min. Exterior Side Yard	0 m	n/a
Min. Interior Side Yard	0 m	2.04 m (North) 3.47 m (South)
Min. Rear Yard	0 m	3.71 m (Kent St S)
Max. Building Height	6 Storeys	6 Storeys
Max. Lot Coverage	80 %	22.7 %
Parking Required	0	96 (38 Surface + 58 Underground)
Accessible Parking Required	4 (2 Type A & 2 Type B)	4 (2 Type A & 2 Type B)

BUILDING AREA (1,013m²)   22.7%
ASPHALT AREA (1,990m²)   44.5%
LANDSCAPED AREA (1,467m²)   32.8%

NOTES:
- Topographic survey base prepared by A.T. McLaren Ltd.
- All dimensions are in metres unless otherwise noted.
- Adjacent parcel fabric, existing features are approximate/ for information purposes only.
- Dimensions from face of curb to face of curb.
- Fire route to be designated by by-law.
- Excess snow to be trucked off site.
- C.S.W. = Concrete Sidewalk.
- All outdoor lighting to be dark sky compliant.

Site Plan Drawing

Existing Commercial/ Residential

Existing Commercial

LOT 12

Proposed Retaining Wall (Max Height 0.45m)

Landscaped

Extent of Underground Parking

Paved Area

Prop. Hydrant

Match to Ex. Sidewalk

LOT 14

Proposed Fire Dept. Connection

Levels 2-6 Above

Landscaped

Stairway to Underground Parking

Flush Curb

AMENITY

COMMERCIAL

LOBBY

Proposed Mixed Use Building
103 Units (6 Storeys)

GARBAGE

MOVE-IN

Proposed Fence/ Handrail

Fire Route

Flush Curb

Paved Area

SERVICE

2 STOREY

Bicycle Rack (6)

STAIRS

COMMERCIAL

Levels 5-6 Above

SERVICE

Accessible Parking Signage

Ramp to Underground parking

Extent of Underground Parking

SERVICE

Proposed Fence/ Handrail

Extent of Underground Parking

Existing Hydro Pole (to be relocated)

Landscaped

Match to Ex. Sidewalk

KENT STREET SOUTH

Existing Residential

NORFOLK STREET SOUTH

WATER STREET

Existing Commercial

Existing Commercial

PIN 50214-0079 (LT)

2 STOREY BRICK ADDITION

COMMERCIAL BUILDING No. 92

2 1/2 STOREY BRICK ADDITION

PLAN 37R-1155

0m   5   10   20m

MHBC
PLANNING URBAN DESIGN & LANDSCAPE ARCHITECTURE

200-540 BINGEMANS CENTRE DR. KITCHENER, ON. N2B 3X9 | P: 519.576.3650 F: 519.576.0121 | WWW.MHBCPLAN.COM

Rev. No.	Date	Issued / Revision	By
1.	Aug. 3, 2023	Preliminary Site Plan	GC

Approval Stamp		Date	August 3, 2023
		Drawn By	GC
		Plan Scale	1:200 (36x24)
		File No.	19129H

Project	66 NORFOLK ST S	Checked By	D.A.
Client		Other	

Crescent Homes
151 Curzon Crescent
Guelph, ON. N1K OB3
P: 647.523.6487

File Name	**SITE PLAN**	Dwg No.	**1 of 1**

K:\19129H- 66 Norfolk Simcoe\SP\SP_Aug3_2023.dwg

MATERIAL LEGEND

① PRECAST BRICK VENEER
COLOUR: BURGUNDY

② PRECAST BRICK VENEER SOLDIER COURSE
COLOUR: BURGUNDY

③ TWO TONE PRECAST STONE VENEER
COLOUR 1: WINDFRESH WHITE
COLOUR 2: OFF THE ROCKS

④ PRECAST VENEER
COLOUR: IRON ORE

⑤ PRECAST VENEER
COLOUR: WINDFRESH WHITE

⑥ BANDING
COLOUR: WINDFRESH WHITE

⑦ WINDOW HEADER/SILL
COLOUR: IRON ORE

⑧ VINYL WINDOW
FRAME COLOUR: BLACK

⑨ VINYL BALCONY SLIDING DOOR
FRAME COLOUR: BLACK

⑩ EXTERIOR ENTRANCE
FRAME COLOUR: BLACK

⑪ CLEAR VISION GLAZING
FRAME COLOUR: BLACK

⑫ SPANDREL GLAZING
COLOUR: IRON ORE

⑬ ALUMINUM COMPOSITE METAL PANEL
COLOUR: IRON ORE

⑭ HOLLOW METAL DOOR
COLOUR: IRON ORE

⑮ GLAZED RAILING

⑯ PRIVACY SCREEN

⑰ METAL AWNING

⑱ CAP FLASHING

⑲ SIGNAGE

⑳ CONCRETE

㉑ LIGHTING

ONTARIO ASSOCIATION OF ARCHITECTS
JOSHUA O.P. BEDARD
LICENCE
7407

No.	REVISIONS	DATE

SITE PLAN APPLICATION	2023.08.03
CHRONOLOGY	DATE

aba architects inc.

CLIENT
CRESCENT HOMES

PROJECT NAME
66 NORFOLK
66 NORFOLK ST. S, SIMCOE, ON N3Y 2W2

DRAWING TITLE
ELEVATION

SCALE
As indicated

SHEET SIZE
24X36

PROJECT NUMBER
2022-044

DRAWING NUMBER
SPA.3.1

ROOF
125.50

MECHANICAL PENTHOUSE
121.70

LEVEL 6
118.10

LEVEL 5
114.50

LEVEL 4
110.90

LEVEL 3
107.70

LEVEL 2
104.50

LEVEL 1
100.00

LEVEL P1
96.20

BUILDING HEIGHT

C   B   66   A

① EAST ELEVATION
SPA.3.1   1 : 125

MATERIAL LEGEND

1. PRECAST BRICK VENEER
COLOUR: BURGUNDY

2. PRECAST BRICK VENEER SOLDIER COURSE
COLOUR: BURGUNDY

3. TWO TONE PRECAST STONE VENEER
COLOUR 1: WINDFRESH WHITE
COLOUR 2: OFF THE ROCKS

4. PRECAST VENEER
COLOUR: IRON ORE

5. PRECAST VENEER
COLOUR: WINDFRESH WHITE

6. BANDING
COLOUR: WINDFRESH WHITE

7. WINDOW HEADER/SILL
COLOUR: IRON ORE

8. VINYL WINDOW
FRAME COLOUR: BLACK

9. VINYL BALCONY SLIDING DOOR
FRAME COLOUR: BLACK

10. EXTERIOR ENTRANCE
FRAME COLOUR: BLACK

11. CLEAR VISION GLAZING
FRAME COLOUR: BLACK

12. SPANDREL GLAZING
COLOUR: IRON ORE

13. ALUMINUM COMPOSITE METAL PANEL
COLOUR: IRON ORE

14. HOLLOW METAL DOOR
COLOUR: IRON ORE

15. GLAZED RAILING

16. PRIVACY SCREEN

17. METAL AWNING

18. CAP FLASHING

19. SIGNAGE

20. CONCRETE

21. LIGHTING

ONTARIO ASSOCIATION of ARCHITECTS
JOSHUA O.P. BEDARD
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No.	REVISIONS	DATE

SITE PLAN APPLICATION	2023.08.03
CHRONOLOGY	DATE

aba architects inc.

CLIENT
CRESCENT HOMES

PROJECT NAME
66 NORFOLK
66 NORFOLK ST. S, SIMCOE, ON N3Y 2W2

DRAWING TITLE
ELEVATION

SCALE
As indicated

SHEET SIZE
24X36

PROJECT NUMBER
2022-044

DRAWING NUMBER
SPA.3.2

Elevation Levels

ROOF 125.50
MECHANICAL PENTHOUSE 121.70
LEVEL 6 118.10
LEVEL 5 114.50
LEVEL 4 110.90
LEVEL 3 107.70
LEVEL 2 104.50
LEVEL 1 100.00
LEVEL P1 96.20

1 SOUTH ELEVATION
SPA.3.2
1 : 125

MATERIAL LEGEND

- (1) PRECAST BRICK VENEER COLOUR: BURGUNDY
- (2) PRECAST BRICK VENEER SOLDIER COURSE COLOUR: BURGUNDY
- (3) TWO TONE PRECAST STONE VENEER COLOUR 1: WINDFRESH WHITE COLOUR 2: OFF THE ROCKS
- (4) PRECAST VENEER COLOUR: IRON ORE
- (5) PRECAST VENEER COLOUR: WINDFRESH WHITE
- (6) BANDING COLOUR: WINDFRESH WHITE
- (7) WINDOW HEADER/SILL COLOUR: IRON ORE
- (8) VINYL WINDOW FRAME COLOUR: BLACK
- (9) VINYL BALCONY SLIDING DOOR FRAME COLOUR: BLACK
- (10) EXTERIOR ENTRANCE FRAME COLOUR: BLACK
- (11) CLEAR VISION GLAZING FRAME COLOUR: BLACK
- (12) SPANDREL GLAZING COLOUR: IRON ORE
- (13) ALUMINUM COMPOSITE METAL PANEL COLOUR: IRON ORE
- (14) HOLLOW METAL DOOR COLOUR: IRON ORE
- (15) GLAZED RAILING
- (16) PRIVACY SCREEN
- (17) METAL AWNING
- (18) CAP FLASHING
- (19) SIGNAGE
- (20) CONCRETE
- (21) LIGHTING

ROOF
125.50

MECHANICAL PENTHOUSE
121.70

LEVEL 6
118.10

LEVEL 5
114.50

LEVEL 4
110.90

LEVEL 3
107.70

LEVEL 2
104.50

LEVEL 1
100.00

LEVEL P1
96.20

66 NORFOLK ST. S

1 WEST ELEVATION
SPA.3.3   1 : 125

ONTARIO ASSOCIATION OF ARCHITECTS
JOSHUA O.P. BEDARD
LICENCE
7407

No.	REVISIONS	DATE

| SITE PLAN APPLICATION | 2023.08.03 |
| CHRONOLOGY | DATE |

aba architects inc.

CLIENT
CRESCENT HOMES

PROJECT NAME
66 NORFOLK
66 NORFOLK ST. S, SIMCOE, ON N3Y 2W2

DRAWING TITLE
ELEVATION

SCALE
As indicated
SHEET SIZE
24X36
PROJECT NUMBER
2022-044

DRAWING NUMBER
SPA.3.3

MATERIAL LEGEND

1. PRECAST BRICK VENEER
COLOUR: BURGUNDY

2. PRECAST BRICK VENEER SOLDIER COURSE
COLOUR: BURGUNDY

3. TWO TONE PRECAST STONE VENEER
COLOUR 1: WINDFRESH WHITE
COLOUR 2: OFF THE ROCKS

4. PRECAST VENEER
COLOUR: IRON ORE

5. PRECAST VENEER
COLOUR: WINDFRESH WHITE

6. BANDING
COLOUR: WINDFRESH WHITE

7. WINDOW HEADER/SILL
COLOUR: IRON ORE

8. VINYL WINDOW
FRAME COLOUR: BLACK

9. VINYL BALCONY SLIDING DOOR
FRAME COLOUR: BLACK

10. EXTERIOR ENTRANCE
FRAME COLOUR: BLACK

11. CLEAR VISION GLAZING
FRAME COLOUR: BLACK

12. SPANDREL GLAZING
COLOUR: IRON ORE

13. ALUMINUM COMPOSITE METAL PANEL
COLOUR: IRON ORE

14. HOLLOW METAL DOOR
COLOUR: IRON ORE

15. GLAZED RAILING

16. PRIVACY SCREEN

17. METAL AWNING

18. CAP FLASHING

19. SIGNAGE

20. CONCRETE

21. LIGHTING

ONTARIO ASSOCIATION
OF
ARCHITECTS
JOSHUA O.P. BEDARD
LICENCE
7407

No.	REVISIONS	DATE

SITE PLAN APPLICATION	2023.08.03
CHRONOLOGY	DATE

aba architects inc.

CLIENT

CRESCENT HOMES

PROJECT NAME

66 NORFOLK
66 NORFOLK ST. S, SIMCOE, ON N3Y 2W2

DRAWING TITLE

ELEVATION

SCALE	DRAWING NUMBER
As indicated	
SHEET SIZE	
24X36	**SPA.3.4**
PROJECT NUMBER	
2022-044	

ROOF
125.50

MECHANICAL PENTHOUSE
121.70

LEVEL 6
118.10

LEVEL 5
114.50

LEVEL 4
110.90

LEVEL 3
107.70

LEVEL 2
104.50

LEVEL 1
100.00

LEVEL P1
96.20

1 NORTH ELEVATION
SPA.3.4   1 : 125

GENERAL NOTES

1. LEGAL BOUNDARY DATA OBTAINED FROM DRAWING No. 36991 - SURVEYORS REAL PROPERTY REPORT , PART 1, PLAN OF LOTS 7 & 14, BLOCK 103 AND ALL OF LOTS 8, 11 BLOCK 103, REGISTERED PLAN 182, PREPARED BY A.T. McLAREN, DATED JUNE 20, 2022.

2. EXISTING TOPOGRAPHICAL INFORMATION OBTAINED FROM SURVEY BY A.T. McLAREN DATED JUNE 20, 2022 AND APPENDED WITH ADDITIONAL SERVICING INFORMATION OBTAINED DRAWINGS RECEIVED FROM THE COUNTY OF NORFOLK.

3. THESE PLANS TO BE READ IN CONJUNCTION WITH THE FUNCTIONAL SERVICING AND SWM REPORT PREPARED BY WALTERFEDY, REF NO. 2022-0285-10 (LATEST REVISION).

4. THIS SET OF PLANS SHALL NOT BE USED FOR CONSTRUCTION UNTIL STAMPED BY THE DESIGN ENGINEER AND APPROVED BY THE COUNTY OF NORFOLK.

5. THIS PLAN TO BE USED FOR SERVICING AND GRADING ONLY. ALL OTHER INFORMATION IS SHOWN FOR ILLUSTRATIVE PURPOSED ONLY. THIS PLAN MUST **NOT** BE USED TO SITE THE BUILDING .

6. NO CHANGES ARE TO BE MADE WITHOUT THE WRITTEN APPROVAL OF THE DESIGN ENGINEER.

7. THIS PLAN NOT TO BE REPRODUCED IN WHOLE OR IN PART WITHOUT THE PERMISSION OF WALTERFEDY.

8. THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS, AND OTHER UNDERGROUND AND ABOVEGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS AND, WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM THEMSELVES OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM AND THOSE NOT LOCATED PRIOR TO CONSTRUCTION.

9. IMMEDIATELY UPON AWARD OF THE CONTRACT (AND 72 HOURS PRIOR TO THE START OF CONSTRUCTION THE CONTRACTOR SHALL ARRANGE TO CHECK AND VERIFY ALL EXISTING CONDITIONS, LOCATIONS AND ELEVATIONS WHICH INCLUDES BUT IS NOT LIMITED TO THE BENCHMARK ELEVATIONS, EXISTING SERVICE CONNECTIONS AND EXISTING INVERTS. THIS SHALL INCLUDE HAVING THE LOCATION AND INVERT ELEVATIONS AT ALL CONNECTION POINTS FOR THE PROPOSED SERVICING TO THE EXISTING MUNICIPAL INFRASTRUCTURE CONFIRMED. ALL FINDING OF THIS PRE-CONSTRUCTION INVESTIGATION SHALL BE REPORTED TO THE DESIGN ENGINEER. IN WRITING THE OWNER SHALL NOT BE RESPONSIBLE FOR STAND BY CHARGES OR COSTS ASSOCIATED TO DELAYS RESULTING FROM A FAILURE BY THE CONTRACTOR TO PROVIDE THIS INFORMATION.

10. PRIOR TO CONSTRUCTION, THE CONTRACTOR MUST:
   10.1. OBTAIN ALL UTILITY LOCATES.
   10.2. OBTAIN ALL NECESSARY PERMITS, LICENSES AND CLEARANCES FROM THE REQUIRED APPROVAL/GOVERNING AUTHORITIES WITH COPIES PROVIDED TO THE CONSULTING ENGINEER.
   10.3. HOLD A PRE-CONSTRUCTION MEETING.
   10.4. VERIFY THAT THE FINISHED FLOOR ELEVATIONS AND BASEMENT ELEVATIONS WHICH MAY APPEAR ON THESE PLANS COMPLY WITH THE LATEST ARCHITECTURAL PLANS.
   10.5. VERIFY ALL DRAWINGS TO BE USED FOR CONSTRUCTION ARE OF THE MOST RECENT REVISION.

19. SHOP DRAWINGS SHALL BE PROVIDED AS REQUESTED FOR REVIEW FOR SPECIALTY AND MODIFIED ITEMS SUCH AS STORMWATER TANKS, OIL/GRIT SEPARATORS AND SPLITTER MANHOLES. SHOP DRAWING REVIEW SHALL NOT INCLUDE STANDARD OPSD ITEMS SUCH AS MANHOLES, CATCHBASINS, ETC.

20. **THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE CONSULTING ENGINEER 72 HOURS PRIOR TO COMMENCING THE SITE WORKS TO REQUEST INSPECTION. THE CONSULTING ENGINEER SHALL DETERMINE THE EXTENT OF INSPECTION AND TESTING REQUIRED FOR CERTIFICATION ON THE UNDERGROUND SERVICE INSTALLATION AS MANDATED BY THE ONTARIO BUILDING CODE DIVISION C, PART 1, SECTION 1.2.2, GENERAL REVIEW. FAILURE TO MAKE SUITABLE ARRANGEMENTS FOR INSPECTION WILL LEAD TO POST CONSTRUCTION TESTING AND INSPECTION AS DETERMINED BY THE ENGINEER. ALL COSTS ASSOCIATED WITH ANY REQUIRED POST CONSTRUCTION TESTING AND INSPECTION SHALL BE BORNE BY THE CONTRACTOR, INCLUDING ANY DELAYS TO CONSTRUCTION, NECESSARY REWORK AND RESTORATION OF DISTURBED WORKS. FINAL CERTIFICATION OF THE WORKS WILL BE WITHELD UNTIL ALL POST CONSTRUCTION INSPECTION OF THE UN-INSPECTED WORKS IS COMPLETE TO THE SATISFACTION OF THE CONSULTING ENGINEER. FULL PAYMENT FOR UN-INSPECTED WORKS MAY BE WITHHELD UNTIL.**

21. WHERE EXISTING SERVICES ARE TO BE REUSED, THE CONTRACTOR SHALL MAKE ARRANGEMENTS TO VERIFY THE CONDITION OF THE SERVICE(S) INCLUDING FIELD LOCATING, CONFIRMING THE INVERTS AND SLOPES OF THE EXISTING SERVICE(S) AND COMPLETE A CCTV INSPECTION FROM THE PROPERTY LINE TO THE MAIN. ALL FINDINGS, INCLUDING CCTV INSPECTION VIDEO AND REPORT, TO BE PROVIDED THE DESIGN ENGINEER FOR APPROVAL A MINIMUM OF 72 HOURS PRIOR TO THE START OF THE SERVICING INSTALLATION. THE OWNER SHALL NOT BE RESPONSIBLE FOR STAND BY CHARGES OR COSTS ASSOCIATED TO DELAYS RESULTING FROM A FAILURE BY THE CONTRACTOR TO PROVIDE THIS INFORMATION.

22. ANY AREA DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO ITS ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE CONSULTANT AND AUTHORITY HAVING JURISDICTION. THE CONTRACTOR IS RESPONSIBLE FOR RESTORING ALL DAMAGED AND/OR DISTURBED PROPERTY WITHIN THE MUNICIPAL RIGHT-OF-WAY TO MUNICIPAL STANDARDS.

23. ALL HEALTH AND SAFETY RELATED SIGNAGE MUST BE POSTED AT THE SITE AS REQUIRED BY APPLICABLE LAW AND BEST MANAGEMENT PRACTICES.

24. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC AND SAFETY MEASURES DURING THE CONSTRUCTION PERIOD , INCLUDING THE SUPPLY, INSTALLATION AND REMOVAL OF ALL NECESSARY SIGNALS, DELINEATORS, MARKERS AND BARRIERS. ALL SIGNS, ETC. SHALL CONFORM TO THE STANDARDS OF NORFOLK COUNTY AND THE MTO MANUAL OF UNIFORM TRAFFIC DEVICES.

25. AT THE END OF CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE THE CONSULTANT WITH A RED LINED SET OF AS-CONSTRUCTED DRAWINGS. THE DRAWINGS MUST REFLECT THE CONSTRUCTED STATE OF THE WORK. SUBMISSION OF UNALTERED DESIGN DRAWINGS AND CONTRACT CHANGES WILL NOT BE ACCEPTED.

26. UNLESS OTHERWISE SPECIFIED, ALL RETAINING WALLS SHALL BE DESIGNED BY OTHERS.

27. SERVICING CONTRACTOR TO TERMINATE ALL SERVICES 1.0m FROM THE FOUNDATION WALL.

28. CONTRACTOR TO MAINTAIN A "CONFINED TRENCH CONDITION" IN ALL SEWER AND SERVICE TRENCHES.

29. THE MAXIMUM GRASSED SLOPE TO BE 3:1 UNLESS NOTED OTHERWISE, SLOPES GREATER THAN 3:1 TO LANDSCAPED WITH LOW MAINTENANCE GROUND COVER.

30. UNLESS OTHERWISE SPECIFIED, FILTER FABRIC TO BE TERRAFIX 270R OR APPROVED EQUIVALENT.

RELOCATIONS, REMOVALS AND ABANDONMENT NOTES

1. CONTRACTOR TO COORDINATE THE RELOCATIONS OF UTILITIES WITH THE UTILITY OWNER AS REQUIRED.

2. ALL REMOVALS INCLUDE OFFSITE DISPOSAL OF WASTE AND DELETERIOUS MATERIALS AT AN APPROVED DISPOSAL SITE.

3. CONTRACTOR TO COORDINATE THE REMOVAL OF EXISTING UTILITIES WITH THE UTILITY OWNER AND THE ELECTRICAL CONSULTANT.

4. CONCRETE SIDEWALKS TO BE SAW CUT AND REMOVED BY THE FULL BAY.

5. CONCRETE CURB AND BOULEVARD TO BE SAW CUT AND REMOVED AS REQUIRED. WHERE REMOVAL LIMITS ARE WITHIN 2.0m OF AN EXISTING EXPANSION JOINT OR SAW CUT, THE REMOVAL LIMITS SHALL EXTEND TO THE EXPANSION JOINT OR SAW CUT.

EROSION CONTROL NOTES

1. ALL EROSION CONTROL FENCING AND TEMPORARY FILTRATION MUST BE INSTALLED BY THE CONTRACTOR AND INSPECTED BY THE CONSULTANT PRIOR TO COMMENCEMENT OF ANY AREA GRADING, EXCAVATING, OR DEMOLITION. CONTRACTOR TO NOTIFY CONSULTANT FOR INSPECTION.

2. ATTACH EROSION CONTROL FENCE TO EXISTING CHAINLINK FENCE WITHIN THE LIMITS OF THE SITE WHERE POSSIBLE.

3. EROSION CONTROL FENCING TO BE PLACED AROUND THE BASE OF ALL STOCKPILES. ALL STOCKPILES TO BE KEPT A MINIMUM OF 2.5m FROM PROPERTY LINES.

4. FILTER FABRIC TO BE TERRAFIX 270R OR APPROVED EQUIVALENT.

5. ALL DITCH INLET CATCHBASINS, CATCHBASINS AND CATCHBASIN MANHOLES TO HAVE TEMPORARY FILTRATION INSTALLED AND MAINTAINED AS PER THE DETAIL ON THIS SHEET 1-1.

6. NO ALTERNATE METHODS OF EROSION CONTROL PROTECTION SHALL BE PERMITTED UNLESS APPROVED BY CONSULTING ENGINEER AND THE COUNTY OF NORFOLK AND LONG POINT CONSERVATION AUTHORITY.

7. ALL EROSION CONTROL STRUCTURES TO REMAIN IN PLACE UNTIL ALL DISTURBED GROUND SURFACES HAVE BEEN RE-STABILIZED EITHER BY PAVING OR RESTORATION WITH VEGETATIVE GROUND COVER.
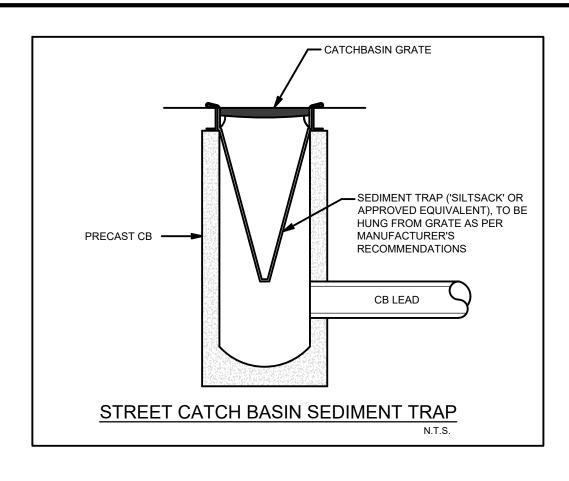
8. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING SEDIMENTS FROM THE PUBLIC ROADWAY AND SIDEWALKS AT THE END OF EACH WORK DAY OR AS DIRECTED BY THE CONSULTANT.
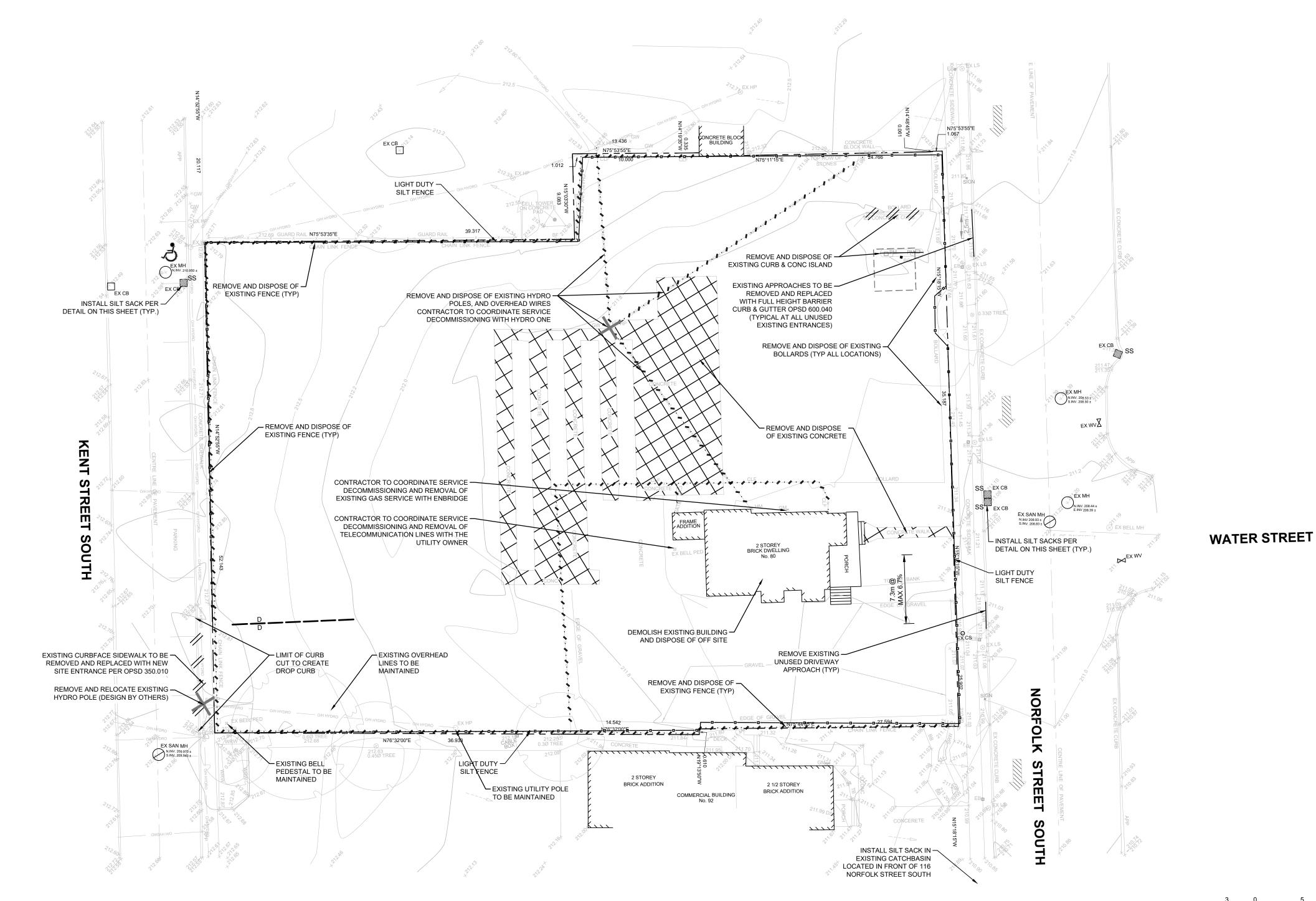
9. ALL EROSION AND SEDIMENT CONTROL MEASURES TO BE INSPECTED BY THE CONTRACTOR AFTER MAJOR RAINFALL EVENTS AND CLEANED OR REPLACED AS REQUIRED 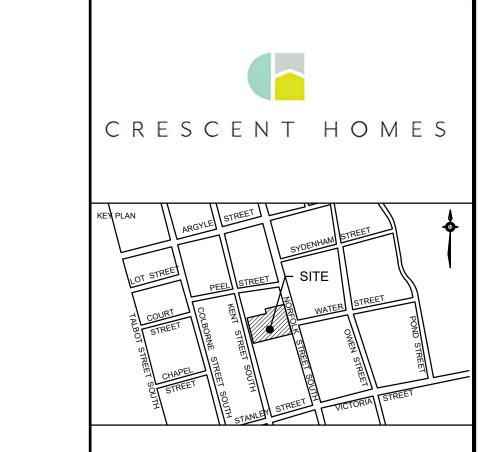TO MEET THEIR INTENDED FUNCTION. SEDIMENTS TO BE REMOVED WHEN ACCUMULATIONS REACH A MAXIMUM OF ONE THIRD (1/3) THE STRUCTURE CAPACITY.

10. THE CONSULTING ENGINEER SHALL MONITOR SITE DEVELOPMENT TO ENSURE ALL EROSION CONTROLS ARE INSTALLED AND MAINTAINED TO THE COUNTY OF NORFOLK REQUIREMENTS. CONTRACTOR TO COMPLY WITH THE CONSULTING ENGINEER'S INSTRUCTIONS TO INSTALL, MODIFY, OR MAINTAIN EROSION CONTROL WORKS.

NOTE:
REFER TO SERVICING PLAN (SHEET C3-1) FOR UNDERGROUND SERVICING (SAN, STM AND WATER) REMOVAL INFORMATION.

SILTATION CONTROL FILTER FABRIC FENCE DETAIL
N.T.S.

NOTE:
SILTATION CONTROL FILTER FABRIC FENCE TO BE "ENVIROFENCE" OR APPROVED EQUAL. FENCE TO BE INSTALLED BEFORE ANY EARTHWORK IS PERFORMED AND REMAIN UNTIL GROUND IS STABILIZED. ALL EARTH STOCKPILES TO HAVE SILTATION CONTROL FILTER FABRIC FENCE AROUND PERIMETER. CONTRACTOR TO MONITOR AND MAINTAIN FENCE AND IMMEDIATELY REPAIR ANY DAMAGE AFTER EVERY RAINFALL.

STREET CATCH BASIN SEDIMENT TRAP
N.T.S.

North

LEGEND

- 0.2m DIA — EXISTING DECIDUOUS TREE
- 0.2m DIA — EXISTING CONIFEROUS TREE
- EXISTING TREE DRIPLINE AND/OR VEGETATION LINE
- EXISTING CONTOUR
- REMOVALS
- LIGHT DUTY SILT FENCE
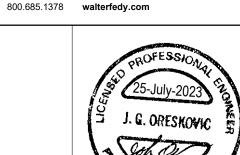- SS — CATCHBASIN SILT SACK

CLIENT
CRESCENT HOMES
180 FROBISHER DRIVE, UNIT#3, WATERLOO

PROJECT
66 NORFOLK STREET SOUTH
TOWN OF SIMCOE
6-STOREY MIXED-USE DEVELOPMENT

TITLE
REMOVALS AND EROSION & SEDIMENT CONTROL PLAN

WALTERFEDY
KITCHENER | HAMILTON | TORONTO
800.685.1378   walterfedy.com

SCALE:	1:250	
DATE:	2023-07-25	
PROJECT NO:	2022-0285-10	SHEET NO.
DRAWN BY:	MPB	**C1-1**
CHECKED BY:	JO	

Plan labels

- LIGHT DUTY SILT FENCE
- EX CB
- INSTALL SILT SACK PER DETAIL ON THIS SHEET (TYP.)
- REMOVE AND DISPOSE OF EXISTING FENCE (TYP)
- REMOVE AND DISPOSE OF EXISTING HYDRO POLES, AND OVERHEAD WIRES CONTRACTOR TO COORDINATE SERVICE DECOMMISSIONING WITH HYDRO ONE
- REMOVE AND DISPOSE OF EXISTING CURB & CONC ISLAND
- EXISTING APPROACHES TO BE REMOVED AND REPLACED WITH FULL HEIGHT BARRIER CURB & GUTTER OPSD 600.040 (TYPICAL AT ALL UNUSED EXISTING ENTRANCES)
- REMOVE AND DISPOSE OF EXISTING BOLLARDS (TYP ALL LOCATIONS)
- REMOVE AND DISPOSE OF EXISTING CONCRETE
- CONTRACTOR TO COORDINATE SERVICE DECOMMISSIONING AND REMOVAL OF EXISTING GAS SERVICE WITH ENBRIDGE
- CONTRACTOR TO COORDINATE SERVICE DECOMMISSIONING AND REMOVAL OF TELECOMMUNICATION LINES WITH THE UTILITY OWNER
- INSTALL SILT SACKS PER DETAIL ON THIS SHEET (TYP.)
- LIGHT DUTY SILT FENCE
- DEMOLISH EXISTING BUILDING AND DISPOSE OF OFF SITE
- REMOVE EXISTING UNUSED DRIVEWAY APPROACH (TYP)
- EXISTING CURBFACE SIDEWALK TO BE REMOVED AND REPLACED WITH NEW SITE ENTRANCE PER OPSD 350.010
- LIMIT OF CURB CUT TO CREATE DROP CURB
- EXISTING OVERHEAD LINES TO BE MAINTAINED
- REMOVE AND RELOCATE EXISTING HYDRO POLE (DESIGN BY OTHERS)
- REMOVE AND DISPOSE OF EXISTING FENCE (TYP)
- EXISTING BELL PEDESTAL TO BE MAINTAINED
- LIGHT DUTY SILT FENCE
- EXISTING UTILITY POLE TO BE MAINTAINED
- INSTALL SILT SACK IN EXISTING CATCHBASIN LOCATED IN FRONT OF 116 NORFOLK STREET SOUTH

Street / building labels

KENT STREET SOUTH
WATER STREET
NORFOLK STREET SOUTH
2 STOREY BRICK DWELLING No. 80
FRAME ADDITION
2 STOREY BRICK ADDITION
2 1/2 STOREY BRICK ADDITION
COMMERCIAL BUILDING No. 92

GENERAL GRADING NOTES

a) THIS PLAN IS NOT FOR CONSTRUCTION UNTIL SEALED BY THE ENGINEER AND APPROVED BY THE COUNTY OF NORFOLK.

b) ALL MATERIALS AND CONSTRUCTION METHODS TO BE AS PER THE COUNTY OF NORFOLK (LATEST REVISIONS) AND THE ONTARIO STANDARDS AND SPECIFICATIONS (LATEST REVISION).
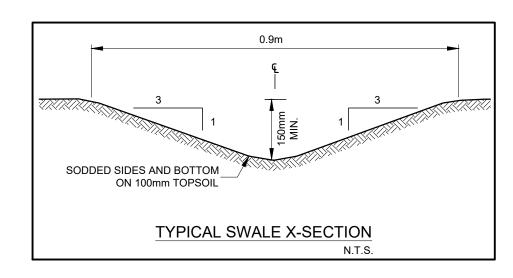
c) REFER TO DRAWING C1-1 FOR CONSTRUCTION NOTES AND SPECIFICATIONS.

d) THE MAXIMUM LOT SURFACE GRADE FOR REAR YARDS SHALL BE 6%. A SLOPE OF 3:1 (3 PARTS HORIZONTAL TO 1 PART VERTICAL) SHALL BE USED TO TAKE UP ANY ADDITIONAL GRADE DIFFERENTIAL. OTHERWISE, AN APPROVE RETAINING WALL IS REQUIRED. IN ANY CASE, THE TOTAL GRADE DIFFERENTIAL OF REAR LOTS IS NOT TO EXCEED 15% INCLUDING RETAINING WALL AND 3:1 SLOPES. HOWEVER, THE REAR YARDS ARE TO HAVE A MINIMUM USABLE (CONTINUOUS SLOPE NOT EXCEEDING 6%) DEPTH OF 6 METRES FROM THE REAR OF THE BUILDING, IRRESPECTIVE OF THE 15%.

e) ALL BOULEVARD AREAS SHALL BE GRADED WITH A CONSTANT SLOPE FROM THE CURB TO THE STREET LIMIT (MINIMUM SLOPE TO BE 2%, MAXIMUM SLOPE TO BE 8%) AND ALL WATER BOXES, MANHOLE COVERS, VALVE BOXES, ETC. SHALL BE SET FLUSH WITH THE FINISHED SOD SURFACE. WHERE SIDEWALKS ARE REQUIRED WITHIN THE BOULEVARD THE MAXIMUM SLOPE FROM CURB TO PROPERTY LINE SHALL BE 4%.

f) ALL LOT SURFACES SHALL BE CONSTRUCTED TO A MINIMUM GRADE OF 2% (EXCLUDING REAR YARD SWALES).

g) THE GRADE OF ANY FRONT WALKWAY SHALL NOT EXCEED 8%.

h) REAR YARD CATCHBASINS AND OUTLET PIPES SHALL BE LOCATED SUCH THAT THE CATCHBASIN IS LOCATED ENTIRELY ON ONE LOT AND THE OUTLET PIPE IS LOCATED ON THE SAME LOT AT 0.35 METRE OFFSET FROM PROPERTY LINE. THE CENTRE OF THE CATCHBASIN SHOULD BE LOCATED 1.0M FROM PROPERTY LINES. 2.0M EASEMENTS ARE REQUIRED ON EITHER SIDE OF THE LOT FOR REAR LOT CATCHBASINS LEADS.

i) EXISTING CURB AT NEW DRIVEWAY ENTRANCES SHALL BE COMPLETELY REMOVED AND REPLACED WITH A STEEL REINFORCED DEPRESSED CURB SECTION.

j) *THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE CONSULTING ENGINEER 72 HOURS PRIOR TO COMMENCING THE SITE WORKS TO REQUEST INSPECTION. THE CONSULTING ENGINEER SHALL DETERMINE THE EXTENT OF INSPECTION AND TESTING REQUIRED FOR CERTIFICATION ON THE UNDERGROUND SERVICE INSTALLATION AS MANDATED BY THE ONTARIO BUILDING CODE DIVISION C, PART 1, SECTION 1.2.2, GENERAL REVIEW. FAILURE TO MAKE SUITABLE ARRANGEMENTS FOR INSPECTION WILL LEAD TO POST CONSTRUCTION TESTING AND INSPECTION AS DETERMINED BY THE ENGINEER. ALL COSTS ASSOCIATED WITH ANY REQUIRED POST CONSTRUCTION TESTING AND INSPECTION SHALL BE BORNE BY THE CONTRACTOR, INCLUDING ANY DELAYS TO CONSTRUCTION, NECESSARY REWORK AND RESTORATION OF DISTURBED WORKS. FINAL CERTIFICATION OF THE WORKS WILL BE WITHHELD UNTIL ALL POST CONSTRUCTION INSPECTION OF THE UN-INSPECTED WORKS IS COMPLETE TO THE SATISFACTION OF THE CONSULTING ENGINEER. FULL PAYMENT FOR UN-INSPECTED WORKS MAY BE WITHHELD UNTIL.*
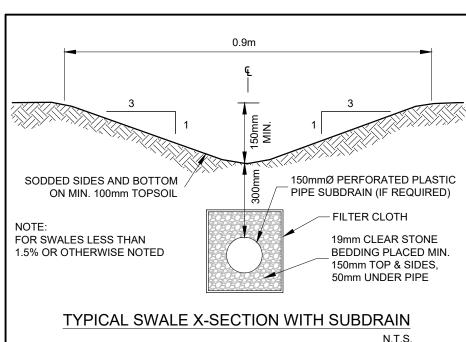
SWALES
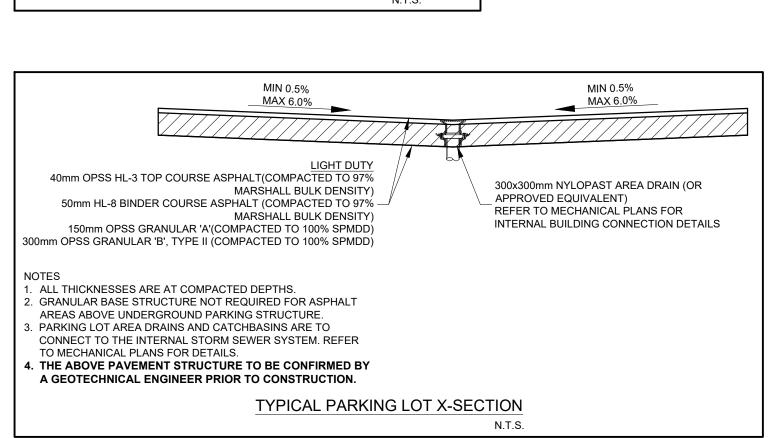
a) ALL REAR YARD DRAINAGE SHALL BE DIRECTED AWAY FROM THE BUILDINGS IN DEFINED SWALES WHICH OUTLET AT THE CURB, SIDEWALK, OR A CATCHBASIN.

b) THE MAXIMUM LENGTH OF A REAR YARD SWALE BETWEEN OUTLETS SHALL BE 90 METRES.

c) REAR AND SIDE YARD SWALES SHALL HAVE A MINIMUM SLOPE OF 1.5%. MAXIMUM DEPTH FOR ALL SWALES SHALL BE 0.5M. MAXIMUM SIDE SLOPE ON ANY SWALE SHALL BE 3:1.
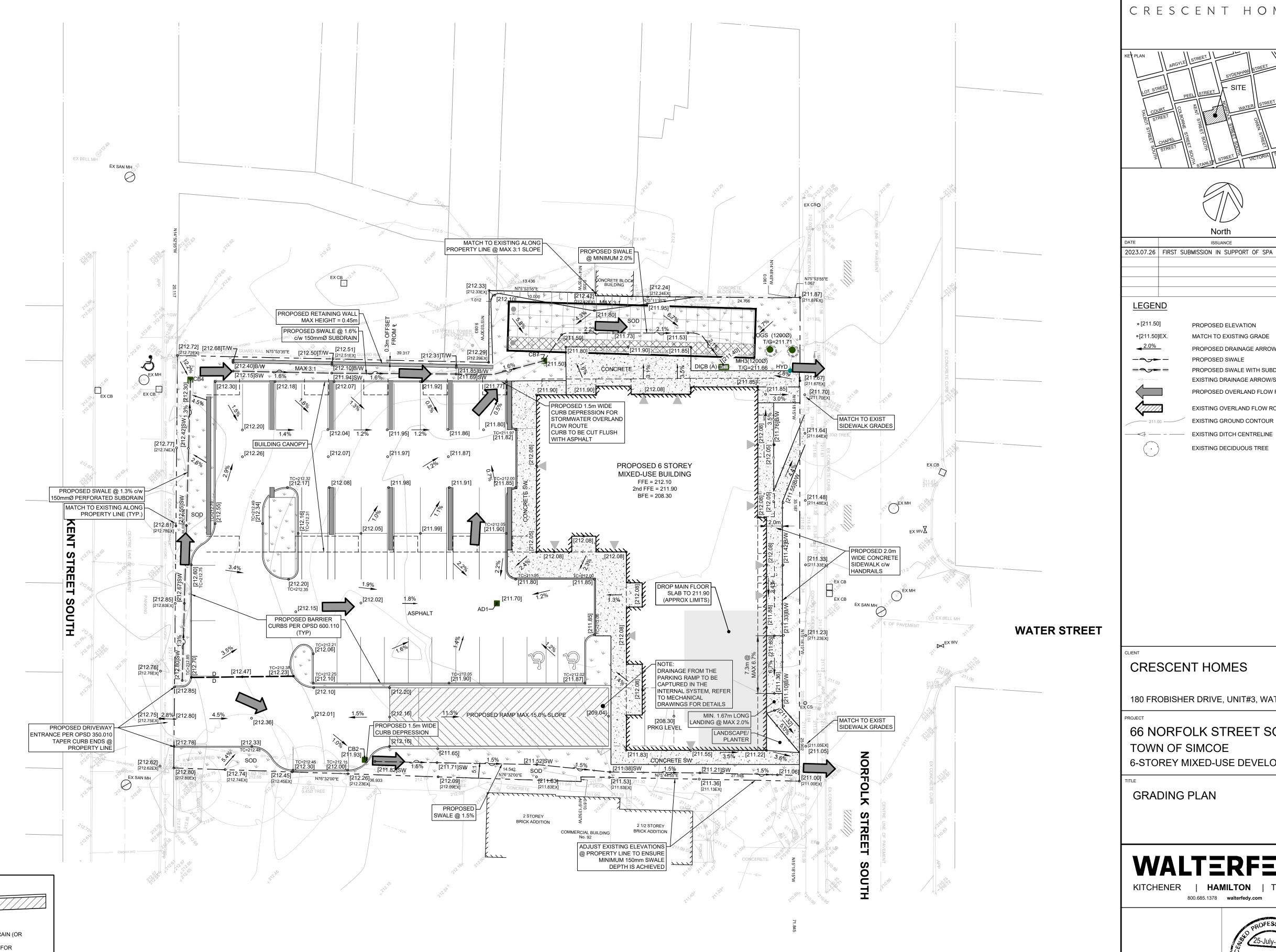SWALE SLOPES LESS THAN 1.5% SHALL REQUIRE 150MM PERFORATED SUBDRAIN.

RETAINING WALLS AND FENCES

a) ALL RETAINING WALLS ARE TO BE DRY-STONE (INTERLOCKING, STACKING TYPE NO TIEBACKS), OR REINFORCED CONCRETE. WHEN USED TO TAKE UP GRADE DIFFERENTIALS, OR ADJACENT TO PUBLIC PROPERTY, RETAINING WALLS SHALL BE DESIGNED BY A QUALIFIED STRUCTURAL ENGINEER AND BE APPROVED BY THE COUNTY.

b) A MINIMUM SETBACK OF 0.5 METRES SHALL BE MAINTAINED TO THE FOUNDATION OF ANY STRUCTURE.

c) ALL RETAINING WALLS 0.60M OR HIGHER REQUIRE PLACEMENT OF FENCING OR A GUARD ALONG THE TOP OF THE WALL, IN ACCORDANCE WITH THE ONTARIO BUILDING CODE.

0.9m

SODDED SIDES AND BOTTOM ON 100mm TOPSOIL

TYPICAL SWALE X-SECTION
N.T.S.

0.9m

SODDED SIDES AND BOTTOM ON MIN. 100mm TOPSOIL

150mmØ PERFORATED PLASTIC PIPE SUBDRAIN (IF REQUIRED)

FILTER CLOTH

19mm CLEAR STONE BEDDING PLACED MIN. 150mm TOP & SIDES, 50mm UNDER PIPE

NOTE:
FOR SWALES LESS THAN 1.5% OR OTHERWISE NOTED

TYPICAL SWALE X-SECTION WITH SUBDRAIN
N.T.S.

MIN 0.5% MAX 6.0%

LIGHT DUTY
40mm OPSS HL-3 TOP COURSE ASPHALT(COMPACTED TO 97% MARSHALL BULK DENSITY)
50mm HL-8 BINDER COURSE ASPHALT (COMPACTED TO 97% MARSHALL BULK DENSITY)
150mm OPSS GRANULAR 'A'(COMPACTED TO 100% SPMDD)
300mm OPSS GRANULAR 'B', TYPE II (COMPACTED TO 100% SPMDD)

300x300mm NYLOPAST AREA DRAIN (OR APPROVED EQUIVALENT) REFER TO MECHANICAL PLANS FOR INTERNAL BUILDING CONNECTION DETAILS

NOTES
1. ALL THICKNESSES ARE AT COMPACTED DEPTHS.
2. GRANULAR BASE STRUCTURE NOT REQUIRED FOR ASPHALT AREAS ABOVE UNDERGROUND PARKING STRUCTURE.
3. PARKING LOT AREA DRAINS AND CATCHBASINS ARE TO CONNECT TO THE INTERNAL STORM SEWERS SYSTEM. REFER TO MECHANICAL PLANS FOR DETAILS.
4. **THE ABOVE PAVEMENT STRUCTURE TO BE CONFIRMED BY A GEOTECHNICAL ENGINEER PRIOR TO CONSTRUCTION.**

TYPICAL PARKING LOT X-SECTION
N.T.S.

KENT STREET SOUTH

NORFOLK STREET SOUTH

WATER STREET

PROPOSED 6 STOREY MIXED-USE BUILDING
FFE = 212.10
2nd FFE = 211.90
BFE = 208.30

PROPOSED 1.5m WIDE CURB DEPRESSION FOR STORMWATER OVERLAND FLOW ROUTE CURB TO BE CUT FLUSH WITH ASPHALT

PROPOSED 2.0m WIDE CONCRETE SIDEWALK c/w HANDRAILS

DROP MAIN FLOOR SLAB TO 211.90 (APPROX LIMITS)

NOTE:
DRAINAGE FROM THE PARKING RAMP TO BE CAPTURED IN THE INTERNAL SYSTEM, REFER TO MECHANICAL DRAWINGS FOR DETAILS

PROPOSED RAMP MAX 15.0% SLOPE

PROPOSED 1.5m WIDE CURB DEPRESSION

PROPOSED DRIVEWAY ENTRANCE PER OPSD 350.010 TAPER CURB ENDS @ PROPERTY LINE

PROPOSED SWALE @ 1.3% c/w 150mmØ PERFORATED SUBDRAIN

MATCH TO EXISTING ALONG PROPERTY LINE (TYP.)

PROPOSED BARRIER CURBS PER OPSD 600.110 (TYP)

BUILDING CANOPY

PROPOSED RETAINING WALL MAX HEIGHT = 0.45m

PROPOSED SWALE @ 1.6% c/w 150mmØ SUBDRAIN

MATCH TO EXISTING ALONG PROPERTY LINE @ MAX 3:1 SLOPE

PROPOSED SWALE @ MINIMUM 2.0%

MATCH TO EXIST SIDEWALK GRADES

MATCH TO EXIST SIDEWALK GRADES

PROPOSED SWALE @ 1.5%

ADJUST EXISTING ELEVATIONS @ PROPERTY LINE TO ENSURE MINIMUM 150mm SWALE DEPTH IS ACHIEVED

2 STOREY BRICK ADDITION

COMMERCIAL BUILDING No. 92

2 1/2 STOREY BRICK ADDITION

CONCRETE BLOCK BUILDING

MIN. 1.67m LONG LANDING @ MAX 2.0%

LANDSCAPE/ PLANTER

PRKG LEVEL

LEGEND

[211.50]	PROPOSED ELEVATION
[211.50]EX.	MATCH TO EXISTING GRADE
2.0%	PROPOSED DRAINAGE ARROW/SLOPE
	PROPOSED SWALE
	PROPOSED SWALE WITH SUBDRAIN
	EXISTING DRAINAGE ARROW/SLOPE
	PROPOSED OVERLAND FLOW ROUTE
	EXISTING OVERLAND FLOW ROUTE
	EXISTING GROUND CONTOUR
	EXISTING DITCH CENTRELINE
	EXISTING DECIDUOUS TREE

North

KEY PLAN

SITE

CLIENT
CRESCENT HOMES

180 FROBISHER DRIVE, UNIT#3, WATERLOO

PROJECT
66 NORFOLK STREET SOUTH
TOWN OF SIMCOE
6-STOREY MIXED-USE DEVELOPMENT

TITLE
GRADING PLAN

WALTERFEDY
KITCHENER | HAMILTON | TORONTO
800.685.1378   walterfedy.com

SCALE:	1:250
DATE:	2023-07-25
PROJECT NO:	2022-0285-10
DRAWN BY:	MPB
CHECKED BY:	JO

SHEET NO:
C2-1

1:250 (m)

SERVICING NOTES

1. THIS PLAN IS NOT FOR CONSTRUCTION UNTIL SEALED BY THE ENGINEER AND APPROVED BY THE COUNTY OF NORFOLK.

2. ALL MATERIALS AND CONSTRUCTION METHODS TO BE AS PER THE COUNTY OF NORFOLK (LATEST REVISIONS) AND THE ONTARIO STANDARDS AND SPECIFICATIONS (LATEST REVISION)

3. REFER TO DRAWING C1-1 FOR CONSTRUCTION NOTES AND SPECIFICATIONS.

4. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE CONSULTING ENGINEER 72 HOURS PRIOR TO COMMENCING THE SITE WORKS TO REQUEST INSPECTION. THE CONSULTING ENGINEER SHALL DETERMINE THE EXTENT OF INSPECTION AND TESTING REQUIRED FOR CERTIFICATION ON THE UNDERGROUND SERVICE INSTALLATION AS MANDATED BY THE ONTARIO BUILDING CODE DIVISION C, PART 1, SECTION 1.2.2, GENERAL REVIEW. FAILURE TO MAKE SUITABLE ARRANGEMENTS FOR INSPECTION WILL LEAD TO POST CONSTRUCTION TESTING AND INSPECTION AS DETERMINED BY THE ENGINEER. ALL COSTS ASSOCIATED WITH ANY REQUIRED POST CONSTRUCTION TESTING AND INSPECTION SHALL BE BORNE BY THE CONTRACTOR, INCLUDING ANY DELAYS TO CONSTRUCTION, NECESSARY REWORK AND RESTORATION OF DISTURBED WORKS. FINAL CERTIFICATION OF THE WORKS WILL BE WITHELD UNTIL ALL POST CONSTRUCTION INSPECTION OF THE UN-INSPECTED WORKS IS COMPLETE TO THE SATISFACTION OF THE CONSULTING ENGINEER. FULL PAYMENT FOR UN-INSPECTED WORKS MAY BE WITHHELD UNTIL.

SANITARY SEWERS/SERVICES

1. THE MINIMUM COVER AT PROPERTY LINE SHALL BE 2.15M. THE MAXIMUM DEPTH AT PROPERTY LINE SHALL BE 2.7M.

2. IF NECESSARY, CONCRETE ENCASED RISERS SHALL BE PROVIDED FOR CONNECTION WITH THE MAIN SEWER. 2% MINIMUM GRADE SHALL BE MAINTAINED FOR CONNECTION PIPES.

3. NO DEFLECTIONS ALLOWED FROM MAIN TO PROPERTY LINE. AFTER THE PROPERTY LINE ONLY 22 ½ DEGREE FITTINGS ARE ALLOWED OR 1.2M, 45 DEGREE SWEEPS. CLEANOUTS ARE REQUIRED EVERY 30.5M AND PRIVATE MANHOLES EVERY 91.3M.

4. HORIZONTAL SEPARATION FROM WATER SERVICE CONNECTIONS OF NOT LESS THAN 2.44M MEASURED HORIZONTALLY FROM UNDISTURBED OR COMPACTED EARTH OR AS APPROVED BY THE MANGER OF ENVIRONMENTAL SERVICES.

5. 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.

STORM SEWERS/SERVICES

6. THE MINIMUM SIZE OF SERVICE SHALL BE 250MM.

7. ALL CONNECTIONS SHALL HAVE AN INSPECTION MANHOLE CONSTRUCTED ON THE MUNICIPAL RIGHT OF WAY WITHIN 1.5M OF THE PROPERTY LINE.

8. THE CONNECTION OF THE STORM DRAIN TO THE STORM SEWER MAY BE MADE AT AN EXISTING MANHOLE OR DIRECTLY TO THE STORM SEWER (IF THE SIZE OF THE CONNECTION IS LESS THAN HALF THE SIZE OF THE STORM SEWER, IF THE CONNECTION SIZE IS EQUAL TO OR GREATER THAN ONE HALF THE SIZE OF THE MAIN SEWER, THE CONNECTION MUST BE MADE TO A MANHOLE, EXISTING OR NEW, ON THE STORM SEWER.

9. STORM DRAIN CONNECTIONS SHALL BE CONSTRUCTED OF MINIMUM 150MM PVC (SDR 28) PIPE. STORM LATERALS FROM THE STORM MAINLINE IN THE ROAD ALLOWANCE SHALL BE WHITE IN COLOUR.

10. ALL STORM DRAIN CONNECTIONS SHALL BE INSTALLED USING TYPE B BEDDING USING 150 MM GRANULAR 'A' AS BEDDING AND 300MM OF GRANULAR A FOR COVER.

WATERMAINS/SERVICES

1. ALL WATER SERVICE CONNECTIONS WILL REQUIRE A CONNECTION PERMIT, WHICH CAN BE PURCHASED AT THE DELHI ADMINISTRATION BUILDING LOCATED AT 183 MAIN STREET OF DELHI, DELHI, ON N4B 2W6, 519-582-2100.

2. TAPPING SLEEVES SHALL CONFORM TO NORFOLK COUNTY'S APPROVED PRODUCT LIST. TAPPING VALVES SHALL OPEN LEFT (COUNTER CLOCKWISE) AND CLOSE RIGHT (CLOCKWISE). PRIOR TO THE TAP BEING PERFORMED THE CONNECTION MUST BE TESTED VIA THE TEST PORT WITH AIR TO AT LEAST 150 PSI TO CONFIRM THAT THE VALVE AND THE SLEEVE HAVE BEEN SECURED PROPERLY. ANY LEAKS AFTER THE TAP WITHIN THIS AREA WILL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR AND IF NECESSARY A TEE INSTALLED INSTEAD OF THE LIVE TAP.

3. ALL VALVES INSTALLED SHALL BE THE SAME SIZE AS THE WATERMAIN.

4. ALL VALVES SHALL BE RESILIENT-SEATED GATE VALVES WHICH CONFORM TO AWWA C509 AND SHALL OPEN LEFT (COUNTER CLOCKWISE) AND CLOSE RIGHT (CLOCKWISE). ALL GATE VALVES SHALL HAVE NON-RISING STEMS, 50MM OPERATING NUTS AND MECHANICAL JOINT ENDS.

5. ALL WATER SERVICES SHALL BE INSTALLED AT RIGHT ANGLES TO THE WATERMAIN.

6. HYDRANT LEADS SHALL BE 150MM AND SHALL BE CONNECTED USING A GATE VALVE AND ANCHOR TEE.

7. PRIVATE HYDRANTS SHALL BE PAINTED AS PER NORFOLK COUNTY FIRE DEPARTMENT INSTRUCTIONS.

Specifications

1. Must be independently tested to the 2013 NJDEP Laboratory Protocol and 2013 ETV Canada protocol (ISO 14034:2016). Separator must be load based on this data.

2. Any testing performed by the manufacturer is unacceptable to demonstrate an alternate equal.

3. Field Testing is unreliable, site and storm specific, and subject to compounding equipment and analytical errors and therefore is unacceptable as verification of an alternate equal. TAMP verification as per NJDEP is strongly consistent with the 2013 NJDEP laboratory protocol.

Flow Criteria

Water Quality Flow Rate cfs (L/s)	
Peak Design Flow Rate cfs (L/s)	

TSS Removal Criteria

Annual TSS Removal (%)	
NJDEP/ETV Canada TSS	
OK150 Sand	
City of Toronto	
Other	

Notes:

1. Headloss K factor of 1.04 for hydraulic gradeline calculations
2. Sump depths shown are typical. Additional depth can be added as required
3. Multiple inlet pipes allowed
4. Drops allowed
5. Inlet invert elevations should be the same or higher than the outlet invert elevation. Inlet can be up to 12" (300 mm) lower than outlet if pretreatment area is omitted but 12" (300 mm) must be added to sump depth to maintain overall treatment volume.
6. Solid Cover shown. HydroStorm can be designed with an inlet grate if required.
7. Oil capacities given are spill capacities.
8. Sediment depths are maximum holding capacities and not recommended capacities for regular maintenance.
9. Capacities are rounded down to nearest 5 gal or ft3 (1L or 0.1 m3 for metric units)
10. Base Extensions not required due to groundwater/buoyancy concerns at the request of the engineer of record.
11. HS4 to HS6 models require one frame and cover. HS7 to HS12 models require two covers

Hydroworks HydroStorm

PROJECT:
LOCATION:
REVISION DATE: 08/07/2020

Hydroworks

HydroStorm Dimensions / Capacities

Model	...
HS 3	
HS 4	
HS 5	
HS 6	
HS 7	
HS 8	
HS 9	
HS 10	
HS 11	
HS 12	

UNDERGROUND STORAGE

TYPE	STORMTECH SC-740 OR APPROVED EQUAL
SIZE (h x w x l)	1.06 x 6.20 x 31.20m
EFFECTIVE STORAGE	133.00m³
TOP OF CLEAR STONE ELEVATION	210.91
TOP OF CHAMBER UNIT ELEVATION	210.76
BOTTOM OF CHAMBER UNIT ELEVATION	210.00
BOTTOM OF BASE CLEAR STONE ELEVATION	209.85

NOTE: ALL JOINTS AND PIPE CONNECTIONS TO BE SEALED PER SUPPLIERS SPECS. BACKFILL AND INSTALLATION DETAILS PER SUPPLIER'S SPECS. SEE SHOP DRAWINGS (BY OTHERS) FOR DESIGN DETAILS AND SPECIFICATIONS. INSTALLATION TO BE CERTIFIED BY AN APPROVED REPRESENTATIVE OF ADS®.

CONTRACTOR TO PROVIDE SHOP DRAWINGS

SEWER CROSSING TABLE

CROSSING #	INVERT	OBVERT	DIFFERENCE
1	209.45 STM	209.25 EX. SAN	0.20m
2	209.53 STM	209.03 EX. WM	*0.50m

*NOTE:
VERTICAL SEPARATION BETWEEN SEWER DRAINS AND WATERMAINS SHALL BE MINIMUM 0.5m PER MINISTRY OF ENVIRONMENT (MOE) GUIDELINES.

LEGEND

Symbol	Description
	PROPOSED SANITARY SEWER/SERVICE
	PROPOSED STORM SEWER/SERVICE
	PROPOSED WATERMAIN/SERVICE
	EXISTING SANITARY SERVICE
	EXISTING STORM SERVICE
	EXISTING WATERMAIN
WV	PROPOSED WATER VALVE
M	PROPOSED WATER METER
MH	PROPOSED STORM MANHOLE
MHA	PROPOSED SANITARY MANHOLE
DV	PROPOSED DOUBLE CHECK VALVE ASSEMBLY
BP	PROPOSED BACKFLOW PREVENTOR
AD	PROPOSED STORM AREA DRAIN
DICB(A)	PROPOSED DITCH INLET CATCHBASIN (TYPE A)
EX CB	EXISTING CATCHBASIN
EX MH	EXISTING STORM MANHOLE
EX SAN MH	EXISTING SANITARY MANHOLE
EX HYD	EXISTING FIRE HYDRANT
CR2	SERVICE CROSSING LOCATION

CLIENT
CRESCENT HOMES
180 FROBISHER DRIVE, UNIT#3, WATERLOO

PROJECT
66 NORFOLK STREET SOUTH
TOWN OF SIMCOE
6-STOREY MIXED-USE DEVELOPMENT

TITLE
SERVICING PLAN

WALTERFEDY
KITCHENER | HAMILTON | TORONTO
800.685.1378 | walterfedy.com

DATE	ISSUANCE	NO.
2023.07.26	FIRST SUBMISSION IN SUPPORT OF SPA	1

SCALE: 1:250
DATE: 2023-07-25
PROJECT NO.: 2022-0285-10
DRAWN BY: MPB
CHECKED BY: JO

SHEET NO.
C3-1

RELOCATIONS, REMOVALS AND ABANDONMENT NOTES

1. UNUSED WATER SERVICES WITHIN THE MUNICIPAL RIGHT-OF-WAY TO BE SHUT OFF AT THE MAIN STOP. THE PIPE SHALL BE DISCONNECTED FROM THE MAIN AND FULLY REMOVED WITHIN THE RIGHT OF WAY LIMITS UP TO AND INCLUDING THE CURBSTOP TO THE SATISFACTION OF THE COUNTY OF NORFOLK.

2. UNUSED SERVICE LATERALS (SANITARY AND STORM) ARE TO BE CAPPED AT THE MAIN AND THE UNUSED PIPE FULLY REMOVED WITHIN THE RIGHT OF WAY LIMITS TO THE SATISFACTION OF THE COUNTY OF NORFOLK.

3. UNUSED SERVICES WITHIN THE PRIVATE PROPERTY TO BE REMOVED/ABANDONED AS FOLLOWS:
   3.1. ALL PIPES WITHIN THE LIMITS OF THE BUILDING AND SERVICING TRENCH EXCAVATIONS SHALL BE REMOVED.
   3.2. WHERE WATER SERVICING PIPE DOES NOT INTERFERE WITH THE SERVICING AND BUILDING EXCAVATION, THE PIPE SHALL BE SAW CUT AT THE LIMITS OF THE EXCAVATIONS, AND MECHANICALLY CAPPED AND THE UNUSED PIPE ABANDONED.
   3.3. WHERE SERVICE LATERALS (SANITARY AND STORM) DO NOT INTERFERE WITH THE SERVICING AND BUILDING EXCAVATIONS, THE PIPE SHALL BE SAW CUT AT THE LIMITS OF THE EXCAVATION, FILLED WITH SAND AND MECHANICALLY CAPPED OR PLUGGED WITH A MINIMUM 0.5 METRE LONG 30MPa CONCRETE PLUG AND THE UNUSED PIPE ABANDONED.

4. EXCAVATIONS WITHIN THE RIGHT-OF-WAY TO BE BACKFILLED WITH GRANULAR "A", PLACED IN 300mm LIFTS AND COMPACTED TO 95% SPD TO THE UNDERSIDE OF THE FINISHED SURFACE (I.E. BASE ASPHALT, SIDEWALK , ETC) OR AS DIRECTED BY THE GEOTECHNICAL CONSULTANT.

5. EXCAVATIONS WITHIN THE SITE TO BE BACKFILLED TO BE BACKFILLED WITH APPROVED SELECT NATIVE MATERIAL PLACED IN 300mm LIFTS AND COMPACTED TO 95% SPD OR AS DIRECTED BY THE GEOTECHNICAL CONSULTANT. IN THE EVENT THAT THE NATIVE MATERIAL IS FOUND TO BE UNSUITABLE, THE EXCAVATIONS SHALL BE BACKFILLED WITH GRANULAR "A" OR APPROVED ALTERNATIVE.

6. REFER TO SHEET C1-1 FOR ADDITIONAL RELOCATION, REMOVAL AND ABANDONMENT NOTES.

CONTROL MANHOLE (MH3)
(SHOP DRAWINGS TO BE PROVIDED)
N.T.S - MANHOLE STRUCTURE MAY NOT BE EXACTLY AS SHOWN

NOTES:
1. INSTALL ORIFICE CONTROL PRIOR TO PLACING CAP.
2. ORIFICE CONTROL TO BE UNIFORM STEEL SECTION WITH NO OPEN SEAMS. MATERIAL TO BE MIN 3mm THICK GALVANIZED STEEL OR ALUMINUM
3. CONTROL FEATURES MUST BE INSTALLED AND INSPECTED BY THE ENGINEER PRIOR TO PAVING TO ENSURE STORMWATER RUNOFF FLOW CONTROLS ARE IN PLACE TO PROTECT DOWNSTREAM SYSTEM.

PLAN VIEW
SECTION A-A

WATERMAIN DEFLECTION
SCALE: 1:50

BEDDING DETAIL
N.T.S.

PIPE INSULATION DETAIL
N.T.S.

ASPHALT RESTORATION DETAIL
N.T.S.

NOTE:
1. TACK COAT TO BE APPLIED TO ALL CONSTRUCTION JOINTS PRIOR TO COMPACTING ASPHALT

PROPOSED 6 STOREY MIXED-USE BUILDING
FFE = 212.10
2nd FFE = 210.90
BFE = 208.30

CRESCENT HOMES

North

KEY PLAN
SITE

KENT STREET SOUTH
NORFOLK STREET SOUTH
WATER STREET

EXISTING SANITARY SERVICE NOTE:
EXISTING SEWER TO BE REUSED MUST BE IN GOOD WORKING CONDITION AND OF ADEQUATE CAPACITY TO MEET THE REQUIREMENTS OF THE SITE. THE APPLICANT/OWNER OR THEIR CONTRACTOR IS RESPONSIBLE FOR HAVING THE SALVAGED SEWER VIDEO INSPECTED IN ACCORDANCE WITH OPSS-409 AND SUBMITTED TO NORFOLK COUNTY PUBLIC WORKS & ENVIRONMENTAL SERVICES DEPARTMENT.

FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT REPORT

CRESCENT HOMES

66 Norfolk Street South, Simcoe ON
Project No.: 2022-0285-10

July 25, 2023

WALTERFEDY

CRESCENT HOMES

FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT REPORT
66 Norfolk Street South, Simcoe ON

Table of Contents

DRAWINGS

1.0   INTRODUCTION

WalterFedy was retained by Crescent Homes to provide consulting engineering services for a proposed multi-unit, mixed-use block located at 66 Norfolk Street South in Simcoe, within the County of Norfolk. The Site fronts onto Norfolk Street South, immediately opposite Water Street in downtown Simcoe. Refer to Figure 1 for the Site Location.

The purpose of this Functional Servicing and Stormwater Management Report is to identify how the development will be serviced, including water, sanitary, and storm connections to the existing municipal infrastructure in support of the Site Plan Application. The report will discuss existing boundary servicing conditions and summarize the servicing demands of the development for confirmation by the County of Norfolk. Stormwater management (SWM) design for the development will include quality and quantity controls. The general grading strategy is also discussed.

Figure 1: Site Location Plan

1.1   Background

The Site has an area of approximately 0.45 hectares and is bound to the east by Norfolk Street South, Kent Street South to the west, and by existing commercial/residential land uses to the north and south. The land is within the Central Business District zone under the Official Plan, which permits the use of the proposed development.

The proposed redevelopment plans for the Site consist of a six-storey apartment building with first-floor commercial units fronting Norfolk Street South, and include underground and surface parking, pedestrian sidewalks with connection to the municipal sidewalks, and landscaped areas. Vehicular entrance to the development will be via the proposed entrance on Kent Street South with pedestrian access to the commercial and residential units via connections to the sidewalk on Norfolk Street South. Refer to Appendix A for the proposed Site Plan.

1.2   Reference Reports

In the preparation of this report, the following material was referenced:

1. *Pre-Submission Consultation Minutes, 66 Norfolk Street South*, The Corporation of Norfolk County, dated January 5, 2002.

2. *Design Criteria*, The Corporation of Norfolk County, dated August 2017.

3. *Integrated Sustainable Master Plan* (ISMP), MMM Group, R.V. Anderson Associates Limited and XCG, dated September 2016.

4. *Design Guidelines for Drinking-Water Systems*, by Ministry of the Environment, Conservation and Parks (MECP) dated May 2019.

5. *MOE Stormwater Management Practices Planning and Design Manual*, Ministry of the Environment dated March 2003.

6. *Erosion & Sediment Control Guidelines for Urban Construction*, Toronto and Region Conservation Authority, 2019.

7. *Water Supply for Public Protection*, Fire Underwriters Survey, 2020

8. Plan, profile, storm, sanitary and watermain Information provided by Norfolk County.

2.0   EXISTING INFORMATION

2.1   Topography

The southeastern corner of the Site is occupied by a converted two-story house complete with a gravel parking lot, currently operating as a pharmacy and residential apartments. The middle area of the Site contains concrete pads which are understood to be remnants from a former greenhouse operation, and the gravelled northeastern quadrant is a former parking lot no longer in operation. The western half of the Site is a manicured grassed area.

In general, the Site falls from the northwestern corner to the southeastern corner, with the Site draining by sheet flow to the Norfolk Street South right-of-way. Elevations on the Site range from 212.85 m adjacent to Kent Street South to 211.00 m at the southeastern corner, adjacent to Norfolk Street South.

The topographic survey available in Appendix B was completed by A.T. McLaren.

2.2   Servicing and Utilities

Servicing information was provided by the County of Norfolk by way of historic drawings. Based on a review of the provided information, the servicing adjacent to the Site can be summarized as follows:

- Norfolk Street South

    o   A 250-mm-diameter PVC sanitary sewer flowing north-to-south is located under the centre of the road along the entire frontage.

    o   A 200-mm-diameter PVC watermain is located on the western side of the road at the northern portion of the Site before crossing to the eastern side of the road, north of the intersection with Water Street, and continuing south.

    o   A 900-mm-diameter concrete storm sewer is located on the eastern side of the road flowing north-to-south to Water Street and then flowing east on Water Street. There is no storm sewer adjacent to the frontage of the site, south of the intersection with Water Street.

- Kent Street South

    o   A 200-mm-diameter sanitary sewer flowing north-to-south is located under the centre of the road along the entire frontage.

    o   A 300-mm-diameter watermain is located on the western side of the road, opposite the entire frontage.

    o   The 375 mm storm sewer terminates at the manhole and a series of catch basins located at the northwestern corner of the site.

- Site Servicing

    o   Based on a review of the provided drawings, the building in the southeastern quadrant of the Site is serviced with a sanitary lateral and water service. The remainder of the Site is unserviced.

A review of the ISMP was completed in preparation for this report and it is understood that the downtown area in Simcoe is well serviced for water, but a community-wide storage deficit was identified. No capacity issues within the sanitary system local to the Site were identified. Based on comments received from the Pre-Consultation Meeting, it is understood that the capacity for this proposed redevelopment will be confirmed by modelling completed by the County's Consultant based on the demands summarized in this report.

A desktop review of the available information, including satellite imagery/Google Maps and historical drawings from the County of Norfolk, regarding the utilities in the area found:

- Norfolk Street South

    o   There is a gas main paralleling the frontage along Norfolk Street South.

    o   There is an underground telecommunication duct located on the eastern side of the road.

    o   There is street lighting, complete with underground wiring, on both sides of the road.

- Kent Street South

    o   There is a gas main along the right-of-way opposite the Site.

    o   An underground telecommunication duct is located along the frontage of the site, terminating at the pedestals located at the southwestern corner of the Site.

    o   Aerial hydro lines with poles are located to the northwest and southeast of the Site, complete with street lights.

- Site Servicing
    - An overhead hydro service is in place for the building in the southeastern quadrant of the Site. It should be noted that this service is located within a legal easement which will be lifted under the redevelopment of the site.
    - In addition to the above-noted hydro, it is assumed the building is serviced with telecommunications and natural gas.
    - A communications tower located on the land immediately north of the Site is also noted.

3.0 DESIGN POPULATION

As previously noted, the proposed development is mixed-used with residential and street-fronting commercial uses. According to the County of Norfolk design criteria, design population density for new residential development is based on a ratio of 2.75 persons/unit; equivalent design populations for commercial land uses are based on a density of 90 persons/hectare. The current Site Plan indicates a range of 60 to 70 units for the proposed building; therefore, the residential population calculations will be conservatively based on 70 units. Based on the zoning for the site, the commercial area within the proposed building shall account for 50% of the first-floor area; therefore, 50% of the property size or 0.23 ha was used in calculating the equivalent design population for the commercial areas. Design population calculations are summarized in Table 1.

Table 1: Design Population Calculations

Site Area	0.45 ha
Number of Residential Units	103 Units
Residential Design Population Density	2.75 persons/hectare
Commercial Design Population Density	90 person/hectare
Residential Design Population	283 persons
Commercial Design Population[A]	20 persons
Design Population (P)	**303 persons**

[A] The proposed commercial accounts for 50% of the first-floor area, therefore, the population was calculated using 50% of the Site Area.

4.0 SANITARY SERVICING

The County of Norfolk design criteria dictates that residential sanitary flows for proposed development are to be sized based on an average daily flow of 0.45 m³/c/d or 450 L/c/d and peaked using the Harmon Formula. The design criteria call for the use of a modified Harmon Formula for mixed-use developments but, given that the commercial population is approximately one-tenth of the total design population, the standard Harmon Formula will be utilized in calculating the peaking factor (M). The peaked flow is to be coupled with an allowance for extraneous flows amounting to 0.28 L/s/ha to calculate the peak design flow (Q). The sanitary design flow calculations are summarized in Table 2.

Harmon Formula: $\quad M = 1 + \frac{14}{4 + \sqrt{P}}$

Modified Harmon Formula (for Mixed-Use): $\quad M = K + \frac{14}{4 + \sqrt{P}}$

Where: $\quad K = AR + 0.80 * \left(\frac{AI + AC}{AR + AI + AC}\right)$

Table 2: Proposed Sanitary Flows

Site Area	0.45 ha
Average Residential Daily Flow	450 L/c/d
Effective Population	303 persons
Average Sanitary Flow	1.58 L/s
Peak Factor (M)	4.08
Residential Sanitary Flow	**6.43 L/s**
Extraneous Flow Allowance	0.28 L/s/ha
Total Extraneous Flow	**0.13 L/s**
Total Peak Sanitary Flow (Q)	**6.56 L/s**

The proposed sanitary service is a 150-mm-diameter pipe at a minimum slope of 2.0%, providing a full flow rate of 21.5 L/s.   Based on the calculated peak sanitary flow, the service will operate at 31% of the full flow and within the County's operating criteria. Refer to drawing C3-1 for the proposed sanitary sewer layout for the development.

A review of the ISMP and the results of the sanitary capacity analysis notes that no capacity issues were identified in the local sanitary system. Based on comments from the Pre-Submission Consultation Minutes, it is understood capacity availability will be confirmed by the County of Norfolk and their Consultant.

5.0   WATER SERVICING

5.1   Design Criteria

The design criteria for the County of Norfolk require that watermain distribution systems be able to convey the larger of the maximum daily demand and fire flow or the peak hourly demand. Additionally, it is mandated that the average daily flow be conveyed with a resulting pressure of no less than 280 kPa (40 psi), and 140 kPa (20 psi) under fire flow conditions.

5.2   Domestic Water Demand

Calculations of the water demand for the proposed development have been determined using the guidelines outlined in the Norfolk County's design criteria and the MECP drinking water guidelines.

In accordance with the design criteria, the average residential demand for the proposed development was estimated using a demand of 450 L/persons/day. To convert the average daily demands into maximum daily and peak hourly flows, the peaking factors are applied as summarized in Table 3.

Table 3: County of Norfolk Peaking Factors

Maximum Daily Demand (All Land Uses)	**2.25**
Maximum Hourly Demand by Land Use:	
Residential	**4.00**
Commercial, Community Services, or Industrial	**2.00**

As with the sanitary peaking factors, given the small size of the commercial population, the residential peaking factor shall be used to conservatively calculate the Maximum Hour Demand.   Table 4 summarizes the domestic water demands for the proposed development.

Table 4: Proposed Domestic Water Demands

Effective Population	303
Average Residential Demand per Capita	450 L/c/d
Maximum Daily Peak Factor	2.25
Maximum Hourly Peak Factor	4.00
Average Daily Demand	1.58 L/s
Maximum Residential Daily Demand	**3.55 L/s**
Maximum Residential Hourly Demand	**6.31 L/s**

5.3   Fire Flow Demand

In addition to the daily domestic demand from the proposed development, fire flow demands are required to assess the adequacy of any proposed watermain system. The County of Norfolk specifies that all fire flow requirements shall be determined per the current issue of *Water Supply for Public Fire Protection* published by the Fire Underwriters Survey. For the purposes of this study, fire demands were assessed for the building, assuming non-combustible construction, limited combustible contents, and includes exposure charges to other buildings. Given the previously-identified storage deficit for the Town in the ISMP, sprinkler protection was also included to help reduce fire flow demands. The required fire flow was initially calculated assuming no fire separations within the building, resulting in a required fire flow of 217 L/s, which could potentially exceed system capacity. It was then assumed that a single firewall divided the building from ground level to roof, approximatey dividing the building in half. The resulting fire flow for the eastern and western sides of the building was 150 L/s and 133 L/s, respectively. The fire flow calculation assumptions and results are summarized in Table 5.   The fire demand calculations are presented in Appendix C.

Table 5: Fire Flow Demands

Gross Floor Area[A]	7880 m^2	
Type of Construction	Non-Combustible Construction (C=0.8)	
Occupancy Charge	Limited Combustible Contents (-15%)	
Automated Sprinkler Protection	Designed and installed per NFPA 13 Standards and fully supervised	
Fire Demand with No Internal Fire Walls	217 L/s	
Fire Demand with Single Firewall Dividing Building		
East Side	150 L/s	
West Side	133 L/S	

[A] - (Area of Floors 1 and 2 + 50% of Floors 3 through 6)

As the Site is located more than 45 m from the nearest hydrant, a private hydrant is proposed north of the proposed building facing Norfolk Street South. In addition, it is recommended that the building mechanical Consultant include a fire department connection located on the eastern face of the proposed building adjacent to Norfolk Street South. Refer to Drawing C3-1 for the proposed watermain servicing layout.

5.4   Calculated Design Flows

Based on the foregoing analysis, the calculated design flows for water are:

- Peak Hour Demand: 6.31 L/s
- Maximum Day + Fire Demand: 156.31 L/s (assume with fire separation)

Modelling for the 2015 and 2041 horizon years indicate the available theoretical fire flow as greater than 158 l/s. Based on comments from the Pre-Submission Consultation Minutes, it is understood capacity availability will be confirmed by the County of Norfolk and their Consultant. Excerpts of the water modelling from the ISMP are included in Appendix D.

Refer to Drawing C3-1 for the proposed watermain service layout.

6.0   STORMWATER MANAGEMENT AND STORM SERVICING

6.1   Stormwater Management Requirements

As outlined in the Pre-Consultation Meeting Minutes, the County has specified the SWM requirements shall be as per Sections 7 and 8 of the Design Criteria, and as per Section 4.0 of the ISMP. The SWM criteria are summarized as follows:

- Quantity – Control discharge from the Site (up to the 100-year, post-development peak flow discharge) to the pre-development discharge rates.

- Quality –The Site design shall provide an "Enhanced" (Level 1, 80% total suspended solids (TSS) removal) level of water quality protection.

- Storm sewer discharge should be directed to the existing 900-mm-diameter storm sewer on Norfolk Street South.

6.2   Pre-Development Conditions

Under the existing condition, the majority of the Site sits vacant, with the southeastern corner of the Site occupied by a converted two-story house complete with a gravel parking lot, and the remaining areas are as previously describedDrainage currently sheet flows across the Site in a west-to-east direction to the Norfolk Street South right-of-way.

For modelling purposes, the Site has been defined as a single catchment (Catchment 101) with the characteristics detailed in Table 6. Refer to Figure 2.0 for an illustration of the pre-development catchment area.

Table 6: Pre-Development Catchment Characteristics

Catchment ID	Description	Area (Ha)
101	Building Roof Area	0.05
	Concrete Pads, Walks, etc	0.05
	Gravel Parking Area	0.14
	Grassed Area	0.21
	Total:	**0.45**
	Total Impervious Area: (Building Roof + Concrete Surfaces + Gravel Areas)	**0.24**
	Impervious Ratio:	**53.7%**

6.3   Allowable Discharge

As previously noted, the County's design criteria stipulates that the maximum allowable discharge from the developed Site for all storm events up to the 100-year storm is to be limited to the pre-development discharge from the same storm event. The pre-development conditions were modelled using the SWMHYMO hydrologic modelling program for the 2-year to 100-year County of Norfolk design storms. Table 7 summarizes the pre-development discharge rates for Catchment 101. Refer to Appendix E for the SWMHYMO input and output files.

Table 7: Pre-Development Discharge Rates

Storm Event	Peak Flow (m^3/s)
2-year	0.050
5-year	0.069
10-year	0.084
25-year	0.102
50-year	0.118
100-year	0.132

6.4   Post-Development Conditions

Under post-development conditions, the Site will be redeveloped with a six-storey apartment building with first-floor commercial units fronting Simcoe Street, and includes underground and surface parking and pedestrian sidewalks and landscaped areas. Refer to Appendix A for the proposed Site Plan.

Based on the proposed Site Plan and grading scheme, the Site has been divided into four catchment areas (201 through 204). Table 8 summarizes the post-development catchment characteristics; refer to Figure 3.0 for post-development catchment areas.

Table 8: Post-Development Catchment Characteristics

Catchment ID	Catchment Area (Ha)	Description	Area (Ha)	Imperviousness Ratio (%)
201	0.23	Building Roof Area & Ramp to Underground Parking	0.23	99.0%
202	0.12	Asphalt Parking Lot, Concrete Sidewalks Landscaped Buffer Areas	0.11 0.01	93.0%
203	0.06	Concrete Sidewalk West and North Landscaped Buffer Area	0.004 0.056	6.0%
204	0.04	Concrete Sidewalk Landscaped Area	0.02 0.02	58.0%
		Total:	**0.45**	
		Impervious Area: (Building Roof + Paved Areas + Sidewalks)	**0.36**	**81.6%**

The increased impervious coverage in the post-development conditions and the requirement to control the post-development discharge to pre-development rates will necessitate the need for on-site SWM controls and related storage. Since the underground parking area occupies the majority of the Site to the property limits, the only opportunity for storage outside the building footprint is the northeastern corner of the site, adjacent to Norfolk Street South, where it is proposed to install StormTech SC-740 storage tanks. Given the proximity to the proposed building and street right-of-way, the tanks will be lined with an impermeable liner to prevent the exfiltration of the stormwater into the surrounding soils. Storm runoff from the roof, driveway/parking, and landscaped surfaces will be collected by roof and area drains and routed internally through the building to the storage tanks and attenuated with an outlet to the existing 900-mm-diameter storm sewer on Norfolk Street South. Refer to Drawing C3-1 for the tank configuration and details.

As with the pre-development conditions, the post-development conditions were modelled using SWMHYMO for the 2-year to 100-year County of Norfolk design storms as provided in the design criteria. Table 9 summarizes the stage-storage-discharge characteristics for the underground storage and control. Outlet flows are controlled by a 140-mm-diameter orifice proposed in the observation manhole at the property line. Refer to Appendix E for the SWMHYMO input/output files and Appendix F for the detailed stage-storage-discharge worksheet.

Table 9: Underground Storage – Stage/Storage Discharge Characteristics

Elevation (m)	Discharge (m³/s)	Volume (m³)	Description
209.75	0.0000	0	Orifice Invert
209.85	0.0071	1	Bottom of Stone
210.00	0.0174	17	Bottom of Tanks
210.20	0.0252	50	
210.40	0.0312	81	Tank Storage
210.60	0.0361	107	
210.80	0.0405	126	
210.90	0.0425	133	Top of Stone

The results of the post-development analysis are summarized in Table 10 and show that the 2-year to 100-year post-development Site discharge is less than the pre-development discharge rates. There is also sufficient storage available in the underground storage area to contain and control the 100-year storm event.

Table 10: Post-Development Discharge and Stormwater Volumes

Storm Event	Pre-Development Flow	Peak Flow (m³/s)		Required Storage Tank Volume (m³)	Ponding Elevation (m)
		Uncontrolled	Controlled[A]		
2-year	0.050	0.075	**0.026**	38	210.10
5-year	0.069	0.100	**0.033**	56	210.22
10-year	0.084	0.118	**0.037**	70	210.34
25-year	0.102	0.140	**0.041**	87	210.43
50-year	0.118	0.157	**0.045**	100	210.58
100-year	0.132	0.173	**0.049**	113	210.70

[A] Controlled discharge from the storm tank + Uncontrolled Discharge from Catchment 204

The Site will be serviced by a 300-mm-diameter storm sewer at a 2.0% slope, with a full flow capacity of 136 L/s, which is sufficient to convey the 37 L/s 100-year storage tank discharge.   Refer to Drawing C3-1 for the tank configuration and details.

Water quality control for the Site will be provided by a HydroStorm HS-6 Oil/Grit separator unit. The unit was sized for an area of 0.41 ha at 84% impervious which comprised Catchments 201, 202, and 203. This is a conservative service area as it includes the roof (which is considered clean water) as well as some landscaping. Catchment 204 represents peripheral areas around the building that are not captured in the internal storm sewer system.   Based on the City of Hamilton Mount Hope rainfall data (the nearest rain gauge in the software), an ETV particle size distribution, and SWM controls upstream of the oil/grit unit, the HS-6 unit will provide 81% TSS removal for 100% of the annual flow. See Appendix F for sizing output from the manufacturer's software. In addition, one row of the underground tanks will be constructed as an "isolator row" that will provide pre-treatment by capturing suspended solids. Therefore, the combination of the isolator row and oil/grit unit will provide a water quality treatment train. The Operating and Maintenance Manuals for both the HydroStorm Unit and Isololator Row are included in Appendix G.

7.0   SITE GRADING

The grading of the Site respects the existing grades along the property boundary with the Site graded to comply with slopes outlined as part of the Accessibility for Ontarians with Disabilities Act (AODA) and the County of Norfolk design criteria.

The grading also allows for the SWM objectives of capturing the runoff from the Site and directing all flows towards the SWM infrastructure via an internal storm system. The grading also provides a major overland flow route to Norfolk Street South for major events. Refer to Drawing C2-1 for the proposed grading design.

8.0   EROSION AND SEDIMENT CONTROL

Sediment tracked onto the roadway during the course of construction will be cleaned by the Contractor daily. Given the small size of the Site and the extent of the excavation required for the underground parking, the installation of a mud mat at the primary construction access is unfeasible. A silt fence will be installed around the development area to eliminate sediment from leaving the Site and will remain in place and be maintained until landscaping has been completed and the soil has been vegetated. A silt fence will also be installed around stockpiles on the Site, with the stockpiles kept a minimum of 2.5 m from the property boundary.

Filter fabric will be wrapped around storm structures to prevent silt or sediment-laden water from entering inlets. These will be inspected periodically to ensure that they have been properly installed and function as designed throughout construction.

The controls will be maintained, and accumulated sediments removed once their capture capacity has been decreased by one-third. It is proposed that, during construction activities, visual monitoring will be conducted periodically including after all major rain events. During the construction period, monitoring will consist of visual observation for the effectiveness of the sediment and erosion controls and sediment migration off-site. Construction inspections will be conducted until such time as the construction activities are complete and vegetation has established itself to a density equivalent to 70% of the background native vegetation density.

It is assumed that the Contractor will keep in mind weather conditions when scheduling work to minimize dust to the neighbouring residential properties from construction activities.

9.0   CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis presented in this report, it is concluded that:

- Connections for the sanitary, storm, and water are feasible on Norfolk Street South to service the Site, though capacity within the existing municipal system needs to be confirmed by the County's Consultant based on the demands included in this report.

- The increase in storm discharge resulting from the proposed redevelopment of the Site can be mitigated through the proposed stormwater management infrastructure.

- "Enhanced" (Level 1, 80% TSS removal) water quality control can be achieved through a treatment train process consisting of a proposed oil/grit separator and an isolator row within the storage tanks.

- Perimeter silt fence, silt fence at the base of all stockpiles, filter fabric over storm structures, and regular street cleaning can provide erosion and sediment control.

Therefore it is recommended that:

- This report be circulated to the required approval authorities in support of the Site Plan approval.

- The County proceed with confirming the available capacity within the municipal system to accommodate the proposed redevelopment of the Site.

All of which are respectfully submitted,

WALTERFEDY

John Oreskovic, P.Eng.
Water Resources Engineer, Civil

joreskovic@walterfedy.com
289.799.3547, Ext. 364

KENT STREET SOUTH

WATER STREET

NORFOLK STREET SO

PROPERTY LINE

CONCRETE BLOCK BUILDING

2 STOREY BRICK DWELLING No. 80

2 STOREY BRICK ADDITION

2 1/2 STOREY BRICK ADDITION

COMMERCIAL BUILDING No. 92

101
0.45
54%

LEGEND

EXISTING OVERLAND FLOW ROUTE

EXISTING STORM DRAINAGE AREA

201 — DRAINAGE AREA #
0.75 — AREA IN HECTARES
90 — % IMPERVIOUS

KENT STREET SOUTH

NORFOLK STREET SOUTH

WATER STREET

CONCRETE BLOCK BUILDING

PROPOSED 6 STOREY MIXED-USE BUILDING
FFE = 212.10
2nd FFE = 211.90
BFE = 208.30

201
0.23
99%

202
0.12
93%

203
0.06
6%

204
0.04
58%

2 STOREY BRICK ADDITION

2 1/2 STOREY BRICK ADDITION

COMMERCIAL BUILDING No. 92

EX 375mmØ STM @ 0.50%

EX 975mmØ CONC. STM @ 0.60%

EX 975mmØ CONC. STM

LEGEND

PROPOSED OVERLAND FLOW ROUTE

PROPOSED STORM DRAINAGE AREA

201 — DRAINAGE AREA #
0.75 — AREA IN HECTARES
90% — % IMPERVIOUS

PROJECT:
66 NORFOLK STREET SOUTH - SIMCOE
6-STOREY MIXED-USE DEVELOPMENT

TITLE:
POST-DEVELOPMENT STORMWATER DRAINAGE AREA PLAN

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WALTERFEDY
KITCHENER OFFICE
675 Queen Street South, Suite 111, Kitchener, Ontario N2M 1A1
T: 519.576.2150   F: 519.576.5499   walterfedy.com

SCALE:	1:500	DATE:	2023-07-07
DRAWN BY:	MPB	PROJECT NO.:	2022-0285-10
CHECKED BY:	JO	FILE:	2022-0285-10_SWM-POST

SHEET NO.:
FIGURE 3.0

P:\2022\0285\10\06-DWGS\CIVIL\2022-0285-10_SWM-POST; POST-FIGURE 3.0; None;
Michael Bucci; 2023-07-25 11:44:37 AM

APPENDIX A

Site Plan

PEEL ST.

KENT ST. S

NORFOLK ST. S

0m MINIMUM INTERIOR SIDE YARD SETBACK

0m MINIMUM INTERIOR SIDE YARD SETBACK

PROPOSED 6 STOREY MIXED USE BUILDING 103 UNITS

LEVELS 2-6 ABOVE

LEVELS 5-6 ABOVE

0m MINIMUM REAR YARD SETBACK

0m MINIMUM FRONT YARD SETBACK

0m MINIMUM INTERIOR SIDE YARD SETBACK

EXTENT OF UNDERGROUND PARKING SHOWN DASHED

13681

14106

31330

10

7

7

2

11

1

SITE PLAN

1:500
2023.04.26

0m   5   10   25   50

1.4

APPENDIX B

Topographic Survey

SURVEYOR'S REAL PROPERTY REPORT
PART 1, PLAN OF PART OF
LOTS 7 & 14, BLOCK 103
AND ALL OF
LOTS 8, 11 & 13, BLOCK 103
REGISTERED PLAN 182
IN THE
NORFOLK COUNTY

SCALE 1:200 METRIC

4 2 0 4 8 12 metres

R.A. McLAREN, O.L.S. – 2022

BENCHMARK:

MONUMENT 0011972U405

VICTORIA STREET CONCRETE BRIDGE OVER LYNN RIVER, IMMEDIATELY WEST OF C.N.RY. CROSSING, TABLET IN COPING OF BRIDGE AT SOUTHWEST END, 1.16 M EAST OF WEST END OF BRIDGE AND 1.16 M BELOW TOP OF CONCRETE END POST.

ELEVATION: 209.222 metres CGVD-1928:1978

NOTE:

UNDERGROUND SERVICE AND UTILITY LOCATIONS MUST BE VERIFIED PRIOR TO CONSTRUCTION

INVERTS MUST BE VERIFIED PRIOR TO CONSTRUCTION

BEARING NOTE:

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

NOTE:

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.9996073

INTEGRATION DATA

KENT STREET SOUTH
(FORMERLY BRICK STREET BY PLAN 182)
PIN 50214-0197 (LT)

NORFOLK STREET SOUTH
PIN 50235-0336 (LT)

WATER STREET

LEGEND:

	DENOTES	MONUMENT SET
		MONUMENT FOUND
IB		IRON BAR
PB		PLASTIC BAR
CC		CUT CROSS
SIB		STANDARD IRON BAR
SSIB		SHORT STANDARD IRON BAR
700		JEWITT & DIXON LTD.
824		A.T. McLAREN, O.L.S.
996		J.B. DODD, O.L.S.
1257		R. LAROCQUE, O.L.S.
OU		ORIGIN UNKNOWN
M		MEASURED
P1		PLAN 37R-10732
P2		PLAN 37R-2526
P3		PLAN 37R-11530
PM		PARKING METER
BOL		BOLLARD
CC		CONCRETE CURB
EB		ELECTRICAL BOX
BBOX		BELL BOX
LP		LIGHT POST
APP		APPROACH
TB		TOP OF BANK
BB		BOTTOM OF BANK
SRW		STONE RETAINING WALL
MH		MANHOLE
CB		CATCH BASIN
BMH		BELL MANHOLE
HH		HAND HOLE
GM		GAS METER
HM		HYDRO METER
CLF		CHAIN LINK FENCE
BF		BOARD FENCE
HP		HYDRO POLE
GW		GUY WIRE
OH		OVERHEAD UTILITIES
DS		DOOR SILL
GF		GARAGE FLOOR
		NOT TO SCALE

SITE BENCH MARK
CUTSTAR
ELEV. = 211.16

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

APPENDIX C

Fire Flow Calculations

REQUIRED FIRE FLOW
Water Supply for Public Fire Protection (FUS 2020)

WALTERFEDY

Project	66 Norfolk Street South, County of Norfolk (Simcoe) ON.
Project #	2022-0285-10
Designer	JGO
Address	66 Norfolk Street , Simcoe
Description	**No Internal Firewalls**

$$F = 220 \times C \times \sqrt{A}$$

F = Required fire flow (LPM)
C = Coefficient related to type of construction
A = Total floor area (including all storeys but excluding any
     basement levels at least 50% below grade)

Type of Construction	Non-Combustible Construction		**C =**	0.8
Description	**Unprotected Metal Structural Components, Masonry or Metal Walls. All Structural Members are Non-Combustible but does not qualify as Fire-Resisitive**			

Total Floor Area	1970	m²
# Storeys	6	
Fire Resistant Building?	NO	

Vertical Openings and Exterior Vertical Communications protected with minimum one (1) hr rating?   NO

Area	7880	m² (Area of Floors 1 and 2 + 50% of Floors 3 through 6)
Description	Total Floor Area	
Required Fire Flow	16000	L/min

Occupancy Charge	Limited-Combustible Contents		
Fire Flow Reduction	-15%	**OR**	-2400	L/min
Required Fire Flow	13600	L/min	

Automated Sprinker Protection	YES	
Designed to NFPA 13 Standard	YES	-30%
Standard Water Supply to Sprinklers and Standpipes	YES	-10%
Fully Supervised System	YES	-10%
Fire Flow Adjustment	-6800	L/min

Exposure 1 (North)	**Distance**	10.4	m	**Charge**	15%
Description	Distance Exisiting Building				

Exposure 2 (East)	**Distance**	25	m	**Charge**	10%
Description	Distance to Buidings on opposite side of Norfolk Street South				

Exposure 3 (West)	**Distance**	60	m	**Charge**	0%
Description	Distance to Buidings on opposite side of Kent Street South				

Exposure 4 (South)	**Distance**	6.1	m	**Charge**	20%
Description	Distance to #92 Norfolk Street South				

Total Exposure Charge	45%	
Fire Flow Adjustment	6120	L/min

Total Required Fire Flow	13000	L/min
Total Required Fire Flow	3434	U.S. GPM
Total Required Fire Flow	217	L/s

REQUIRED FIRE FLOW
Water Supply for Public Fire Protection (FUS 2020)

WALTERFEDY

Project	66 Norfolk Street South, County of Norfolk (Simcoe) ON.
Project #	2022-0285-10
Designer	JGO
Address	66 Norfolk Street , Simcoe
Description	**West Side of Building with Internal Firewall Dividing Bldg in Half from Gound to Roof**

$$F = 220 \times C \times \sqrt{A}$$

F = Required fire flow (LPM)
C = Coefficient related to type of construction
A = Total floor area (including all storeys but excluding any basement levels at least 50% below grade)

Type of Construction	Non-Combustible Construction	**C =**	0.8
Description	Unprotected Metal Structural Components, Masonry or Metal Walls. All Structural Members are Non-Combustible but does not qualify as Fire-Resisitive		

Total Floor Area	3985	m²
# Storeys	6	
Fire Resistant Building?	NO	
Vertical Openings and Exterior Vertical Communications protected with minimum one (1) hr rating?		NO
Area	3985	m² (Area of Floors 1 and 2 + 50% of Floors 3 through 6)
Description	Total Floor Area	See sketch in Appendix C
Required Fire Flow	11000	L/min

Occupancy Charge	Limited-Combustible Contents			
Fire Flow Reduction	-15%	OR	-1650	L/min
Required Fire Flow	9350	L/min		

Automated Sprinker Protection		YES	
Designed to NFPA 13 Standard		YES	-30%
Standard Water Supply to Sprinklers and Standpipes		YES	-10%
Fully Supervised System		YES	-10%
Fire Flow Adjustment			-4675 L/min

Exposure 1 (North)	**Distance**	10.4	m	**Charge**	15%
Description	Distance Exisiting Building				
Exposure 2 (East)	**Distance**	0	m	**Charge**	0%
Description	Firewall with 2-hr rating				
Exposure 3 (West)	**Distance**	60	m	**Charge**	0%
Description	Distance to Buidings on opposite side of Kent Street South				
Exposure 4 (South)	**Distance**	6.1	m	**Charge**	20%
Description	Distance to #92 Norfolk Street South				

Total Exposure Charge	35%
Fire Flow Adjustment	3272.5 L/min

Total Required Fire Flow	8000	L/min
Total Required Fire Flow	2113	U.S. GPM
Total Required Fire Flow	133	L/s
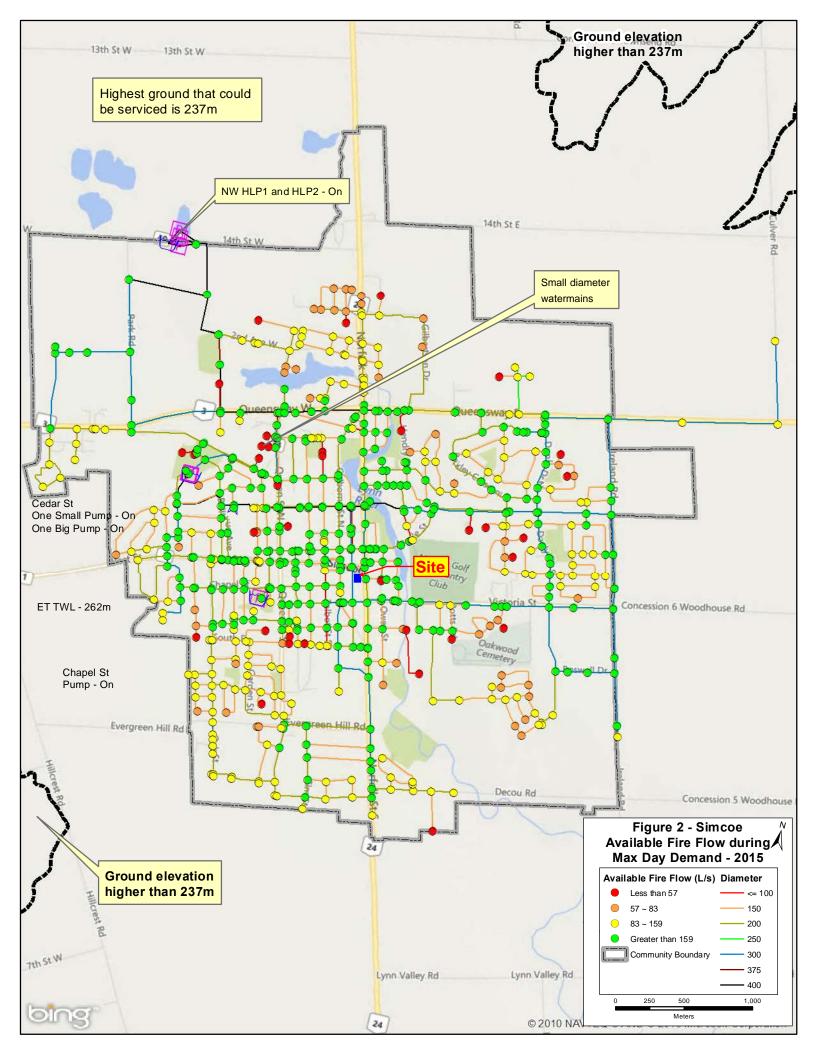
REQUIRED FIRE FLOW
Water Supply for Public Fire Protection (FUS 2020)

WALTERFEDY

Project	66 Norfolk Street South, County of Norfolk (Simcoe) ON.
Project #	2022-0285-10
Designer	JGO
Address	66 Norfolk Street , Simcoe
Description	**East Side of Building with Internal Firewall Dividing Bldg in Half from Gound to Roof**

$$F = 220 \times C \times \sqrt{A}$$

F = Required fire flow (LPM)
C = Coefficient related to type of construction
A = Total floor area (including all storeys but excluding any
 basement levels at least 50% below grade)

Type of Construction	Non-Combustible Construction	**C =**	0.8
Description	**Unprotected Metal Structural Components, Masonry or Metal Walls. All Structural Members are Non-Combustible but does not qualify as Fire-Resisitive**		

Total Floor Area	3895	m²
# Storeys	6	
Fire Resistant Building?	NO	

Vertical Openings and Exterior Vertical Communications protected with minimum one (1) hr rating?	NO

Area	3895	m² (Area of Floors 1 and 2 + 50% of Floors 3 through 6)
Description	Total Floor Area	See sketch in Appendix C

Required Fire Flow	11000	L/min

Occupancy Charge	Limited-Combustible Contents			
Fire Flow Reduction	-15%	OR	-1650	L/min
Required Fire Flow	9350	L/min		

Automated Sprinker Protection	YES		
Designed to NFPA 13 Standard	YES	-30%	
Standard Water Supply to Sprinklers and Standpipes	YES	-10%	
Fully Supervised System	YES	-10%	
Fire Flow Adjustment		-4675	L/min

Exposure 1 (North)	**Distance**	10.4	m	**Charge**	15%
Description	Distance Exisiting Building				
Exposure 2 (East)	**Distance**	25	m	**Charge**	10%
Description	Distance to Buidings on opposite side of Norfolk Street South				
Exposure 3 (West)	**Distance**	0	m	**Charge**	0%
Description	Firewall with 2-hr rating				
Exposure 4 (South)	**Distance**	6.1	m	**Charge**	20%
Description	Distance to #92 Norfolk Street South				

Total Exposure Charge	45%	
Fire Flow Adjustment	4207.5	L/min

Total Required Fire Flow	9000	L/min
Total Required Fire Flow	2378	U.S. GPM
Total Required Fire Flow	150	L/s
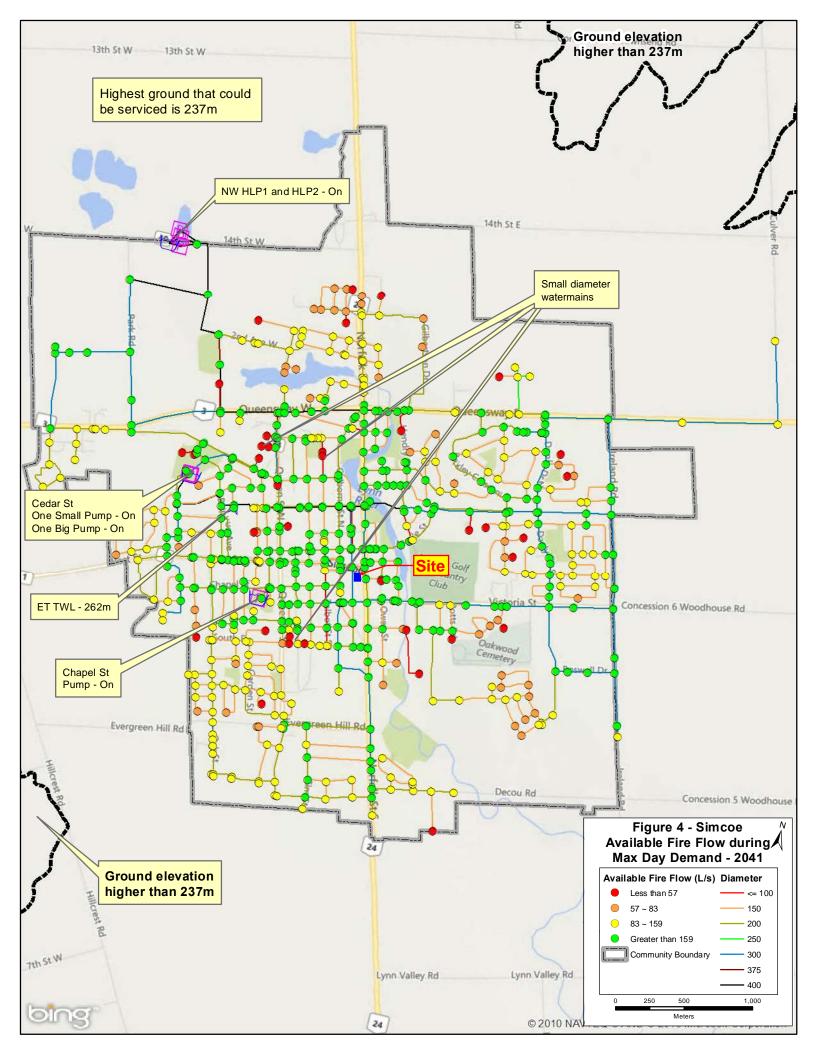
FUS FLOOR AREAS WITH FIREWALLS

FUS floor area west side (ground + upper floors)
= 1st + 2nd + 50% of Floors 3 to 6
= 985 + 1000 + (0.50 x 1000 x 4)
= 3985 m²

FUS floor area east side (ground + upper floors)
= 1st + 2nd + 50% of Floors 3 to 6
= 985 + 970 + (0.50 x 970 x 4)
= 3895 m²

Ground Floor

Ground Floor West A = 985 m²

Ground Floor East A = 985 m²

2-Hr Firewall

AMENITY
116.2 m²
1251 ft²

COMMERCIAL
124.7 m²
1343 ft²

LOBBY

GARBAGE ROOM

MOVE-IN

SERVICE

COMMERCIAL
250.6 m²
2698 ft²

SERVICE

STAIR

SERVICE

SERVICE

STAIR

Floors 2 - 6

Floor West A = 1000 m²

Floor East A = 970 m²

2-Hr Firewall

1 BED 75.0 m² 807 ft²	1 BED 69.3 m² 746 ft²	1 BED 70.0 m² 753 ft²	1 BED 70.0 m² 753 ft²	1 BED 70.0 m² 753 ft²	1 BED 70.0 m² 753 ft²	1 BED 70.0 m² 753 ft²	1 BED 64.5 m² 694 ft²

2 BED
98.2 m²
1057 ft²

2 BED
86.0 m²
926 ft²

STAIR

2 BED
113.7 m²
1224 ft²

1 BED
69.3 m²
746 ft²

1 BED
69.3 m²
746 ft²

1 BED
69.3 m²
746 ft²

1 BED
85.6 m²
922 ft²

1 BED
66.5 m²
716 ft²

1 BED
65.9 m²
709 ft²

1 BED
80.7 m²
868 ft²

2 BED
124.9 m²
1344 ft²

STAIR

1 BED
69.8 m²
751 ft²

2 BED
85.3 m²
919 ft²

APPENDIX D

Excerpts from the ISMP - Water

Figure 2 - Simcoe Available Fire Flow during Max Day Demand - 2015

Figure 4 - Simcoe Available Fire Flow during Max Day Demand - 2041

APPENDIX E

SWMHYMMO Files

```
2     Metric units
*#**********************************************************************|
*#  Project Name: 66 NORFOLK STREET SOUTH
*#                SIMCOE, ONTARIO
*#  JOB NUMBER  : 2022-0285-10
*#      Date    : JULY 2023
*#    Revised   :
*#    Company   : WALTER FEDY
*#      File    : 22-0285A.DAT
*#**********************************************************************|
*
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[002]
                    NRF4-002.STM
*
READ STORM          STORM_FILENAME "STORM.001"
*
*#**********************************************************************|
*%---------------|------------------------------------------------------|
*#        PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ===============================================
*#**********************************************************************|
*
*# CATCHMENT 101 - EXISTING SITE CONDITIONS
*
CALIB STANDHYD      ID=[1], NHYD=["101"], DT=[1](min), AREA=[0.45](ha),
                    XIMP=[0.54], TIMP=[0.54], DWF=[0](cms), LOSS=[2],
                    SCS curve number CN=[75],
                    Pervious   surfaces: IAper=[4.0](mm), SLPP=[3.0](%),
                                         LGP=[32](m), MNP=[0.250], SCP=[0](min),
                    Impervious surfaces: IAimp=[1.0](mm), SLPI=[0.6](%),
                                         LGI=[42](m), MNI=[0.015], SCI=[0](min),
                    RAINFALL=[ ,   ,   ,   , ](mm/hr) ,   END=-1
*#**********************************************************************|
*#**********************************************************************|
*#**********************************************************************|
*%---------------|------------------------------------------------------|
*#        POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ================================================
*#**********************************************************************|
*
*# CATCHMENT 201 - PROPOSED BUIDLING ROOF AND RAMP
*
CALIB STANDHYD      ID=[1], NHYD=["301"], DT=[1](min), AREA=[0.23](ha),
                    XIMP=[0.99], TIMP=[0.99], DWF=[0](cms), LOSS=[2],
                    SCS curve number CN=[75],
                    Pervious   surfaces: IAper=[4.0](mm), SLPP=[2.0](%),
                                         LGP=[0.1](m), MNP=[0.250], SCP=[0](min)
                    Impervious surfaces: IAimp=[1.0](mm), SLPI=[1.0](%),
                                         LGI=[10](m), MNI=[0.015], SCI=[0](min),
                    RAINFALL=[ ,   ,   ,   , ](mm/hr) ,   END=-1
*#**********************************************************************|
*# CATCHMENT 202 - PARKING, DRIVEWAY SURFACE AND LANDSCAPING
*
CALIB STANDHYD      ID=[2], NHYD=["202"], DT=[1](min), AREA=[0.12](ha),
                    XIMP=[0.93], TIMP=[0.93], DWF=[0](cms), LOSS=[2],
                    SCS curve number CN=[75],
```

```
                       Pervious   surfaces: IAper=[4.0](mm), SLPP=[2.0](%),
                                            LGP=[20](m), MNP=[0.250], SCP=[0](min),
                       Impervious surfaces: IAimp=[1.0](mm), SLPI=[2.0](%),
                                            LGI=[15](m), MNI=[0.015], SCI=[0](min),
                       RAINFALL=[ ,  ,  ,  , ](mm/hr) ,   END=-1
*#*************************************************************************|
*# CATCHMENT 203 – LANDSCAPING AT NORTH AND NORTHEAST
*
CALIB NASHYD        ID=[3], NHYD=["203"], DT=[1]min, AREA=[0.06](ha),
                    DWF=[0](cms),  CN/C=[75], IA=[4.0](mm),
                    N=[3], TP=[0.17]hrs,
                    RAINFALL=[ ,  ,  ,  , ](mm/hr),  END=-1
*%----------------|--------------------------------------------------------|
*%----------------|--------------------------------------------------------|
*# TOTAL FLOW FROM ROOF AND SURFACE ROUTED THROUGH SWM STORAGE – 201+202+203
ADD HYD             IDsum=[7], NHYD=["T-SWM"], IDs to add=[1 2 3]
*%----------------|--------------------------------------------------------|
* ROUTE THROUGH BASEMENT STORAGE TANK C/W 140 MMM ORIIFICE CONTROL
ROUTE RESERVOIR     IDout=[8],  NHYD=["TANK"],  IDin=[7],
                    RDT=[1](min),
                         TABLE of ( OUTFLOW-STORAGE ) values
                                   (cms) – (ha-m)
   0.0000     0.0000
   0.0071     0.0001
   0.0174     0.0017
   0.0216     0.0039
   0.0252     0.0050
   0.0283     0.0066
   0.0312     0.0081
   0.0337     0.0094
   0.0361     0.0107
   0.0384     0.0117
   0.0405     0.0126
   0.0425     0.0133
                                -1        -1   (max twenty pts)
                    IDovf=[9], NHYDovf=["OF-TNK"]
*#*************************************************************************|
COMPUTE VOLUME      ID=[7], STRATE=[-100](cms), RELRATE=[0.040](cms)
*%----------------|--------------------------------------------------------|
*
*# CATCHMENT 204 – UNCONTROLLED FRONT AREA
*
CALIB STANDHYD      ID=[4], NHYD=["204"], DT=[1](min), AREA=[0.04](ha),
                    XIMP=[0.58], TIMP=[0.58], DWF=[0](cms), LOSS=[2],
                    SCS curve number CN=[75],
                    Pervious   surfaces: IAper=[4.0](mm), SLPP=[2.0](%),
                                         LGP=[2.0](m), MNP=[0.250], SCP=[0](min)
                    Impervious surfaces: IAimp=[1.0](mm), SLPI=[2.0](%),
                                         LGI=[2.0](m), MNI=[0.015], SCI=[0](min)
                    RAINFALL=[ ,  ,  ,  , ](mm/hr) ,   END=-1
*#*************************************************************************|
*# TOTAL SITE DISCHARGE – CONTORLLED + UNCONTROLLED
ADD HYD             IDsum=[10], NHYD=["T-CONT"], IDs to add=[8 9 4]
*%----------------|--------------------------------------------------------|
*
*%----------------|--------------------------------------------------------|
```

```
*# TOTAL UNCONTROLLED FLOW FROM SITE
ADD HYD              IDsum=[10], NHYD=["UNCON"], IDs to add=[7 4]
*%----------------|---------------------------------------------------------|
*
* RUN REMAINING DESIGN STORMS (HAMILTON MOUNT HOPE 5 TO 100-YR)
*
START                TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[005]
                     NRF4-005.STM
*
START                TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[010]
                     NRF4-010.STM
*
START                TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[025]
                     NRF4-025.STM
*
START                TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[050]
                     NRF4-050.STM
*
START                TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[100]
                     NRF4-100.STM
*
* START              TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[125]
*                    MTHP25MM.STM
*
*%----------------|---------------------------------------------------------|
FINISH
```

```
===============================================================
   SSSSS  W   W  M   M  H   H  Y   Y  M   M  OOO      999   999   =========
   S      W   W  MM MM  H   H   Y Y   MM MM  O   O      9 9 9 9    9   9  9
   SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O ##  9 9 9 9     9   9  9   Ver 4.05
       S  W W W  M   M  H   H    Y    M   M  O   O     9999  9999  Sept 2011
   SSSSS  W   W  M   M  H   H    Y    M   M  OOO        9   9  9   =========
                                                       9 9 9 9    # 2018430
      StormWater Management HYdrologic Model           999   999  =========

   ****************************************************************
   ************************** SWMHYMO Ver/4.05 ********************
   *********  A single event and continuous hydrologic simulation model  *********
   *********    based on the principles of HYMO and its successors       *********
   *********           OTTHYMO-83 and OTTHYMO-89.                         *********
   ****************************************************************
   ********* Distributed by:  J.F. Sabourin and Associates Inc.  *********
   *********          Ottawa, Ontario: (613) 836-3884            *********
   *********          Gatineau, Quebec: (819) 243-6858           *********
   *********          E-Mail: swmhymo@jfsa.Com                   *********
   ****************************************************************


   ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
   ++++++++++ Licensed user: WalterFedy                        +++++++++
   ++++++++++          Kitchener          SERIAL#:2018430      +++++++++
   ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

   ****************************************************************
   *********      ++++++ PROGRAM ARRAY DIMENSIONS ++++++         *********
   *********      Maximum value for ID numbers  :     10        *********
   *********      Max. number of rainfall points: 105408        *********
   *********      Max. number of flow points   : 105408         *********
   ****************************************************************


   **********************  D E T A I L E D   O U T P U T  *****************
   ****************************************************************
   *      DATE: 2023-07-25    TIME: 19:28:03   RUN COUNTER: 000598       *
   ****************************************************************
   * Input   filename: P:\2022\0285\10\05-DSGN\CIVL\SWM\22-0285A.dat     *
   * Output  filename: P:\2022\0285\10\05-DSGN\CIVL\SWM\22-0285A.out     *
   * Summary filename: P:\2022\0285\10\05-DSGN\CIVL\SWM\22-0285A.sum     *
   * User comments:                                                      *
   * 1:_____    *
   * 2:_____    *
   * 3:_____    *
   ****************************************************************
```

```
-------------------------------------------------------------------------------
001:0001-----------------------------------------------------------------------
*#*****************************************************************************|
*#  Project Name: 66 NORFOLK STREET SOUTH                                     |
*#                SIMCOE, ONTARIO                                             |
*#   JOB NUMBER  : 2022-0285-10                                               |
*#      Date     : JULY 2023                                                  |
*#    Revised    :                                                            |
*#    Company    : WALTER FEDY                                                |
*#      File     : 22-0285A.DAT                                               |
*#*****************************************************************************|
*
    ** END OF RUN :   1

   *****************************************************************************
```

```
-------------------
| START           |   Project dir.: P:\2022\0285\10\05-DSGN\CIVL\SWM\
-------------------   Rainfall dir.: P:\2022\0285\10\05-DSGN\CIVL\SWM\
   TZERO =   .00 hrs on       0
   METOUT=   2 (output = METRIC)
   NRUN  = 002
   NSTORM=   1
        #  1=NRF4-002.STM
-------------------------------------------------------------------------------
002:0002-----------------------------------------------------------------------
*#*****************************************************************************|
*#  Project Name: 66 NORFOLK STREET SOUTH                                     |
*#                SIMCOE, ONTARIO                                             |
*#   JOB NUMBER  : 2022-0285-10                                               |
*#      Date     : JULY 2023                                                  |
*#    Revised    :                                                            |
*#    Company    : WALTER FEDY                                                |
*#      File     : 22-0285A.DAT                                               |
*#*****************************************************************************|
*
-------------------------------------------------------------------------------
002:0002-----------------------------------------------------------------------
*
-------------------
| READ STORM      |   Filename: NORFOLK 2-YR 4HR CHICAGO STORM
| Ptotal= 35.21 mm|   Comments: NORFOLK 2-YR 4HR CHICAGO STORM
-------------------
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.17	2.656	1.17	8.782	2.17	6.717	3.17	3.208
.33	2.957	1.33	18.663	2.33	5.591	3.33	2.977
.50	3.352	1.50	72.243	2.50	4.822	3.50	2.781
.67	3.896	1.67	22.255	2.67	4.259	3.67	2.612
.83	4.702	1.83	12.075	2.83	3.828	3.83	2.466
1.00	6.040	2.00	8.542	3.00	3.487	4.00	2.337

```
-------------------------------------------------------------------------------
002:0003-----------------------------------------------------------------------
*
*#*****************************************************************************|
*#        PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING                      |
*#        ===============================================                     |
*#*****************************************************************************|
*
*# CATCHMENT 101 - EXISTING SITE CONDITIONS
*
----------------------
```

```
--------------------
| CALIB STANDHYD   |   Area    (ha)=    .45
| 01:101  DT= 1.00 |   Total Imp(%)=  54.00   Dir. Conn.(%)=  54.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
   Surface Area    (ha)=        .24          .21
   Dep. Storage    (mm)=       1.00         4.00
   Average Slope   (%)=         .60         3.00
   Length          (m)=       42.00        32.00
   Mannings n       =          .015         .250

   Max.eff.Inten.(mm/hr)=     72.24        12.23
             over (min)=       2.00        15.00
   Storage Coeff.  (min)=      2.20 (ii)  14.86 (ii)
   Unit Hyd. Tpeak (min)=      2.00        15.00
   Unit Hyd. peak  (cms)=       .53          .08

                                                      *TOTALS*
   PEAK FLOW       (cms)=       .05          .00         .050 (iii)
   TIME TO PEAK    (hrs)=      1.50         1.73        1.500
   RUNOFF VOLUME   (mm)=      34.21         8.40       22.339
   TOTAL RAINFALL  (mm)=      35.21        35.21       35.208
   RUNOFF COEFFICIENT  =        .97          .24         .634

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* =  75.0   Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
-------------------------------------------------------------------------------
002:0004-----------------------------------------------------------------------
*#*****************************************************************************|
*#*****************************************************************************|
*#*****************************************************************************|
*#        POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING                     |
*#        ================================================                    |
*#*****************************************************************************|
*
*# CATCHMENT 201 - PROPOSED BUIDLING ROOF AND RAMP
*
----------------------
```

```
--------------------
| CALIB STANDHYD   |   Area    (ha)=    .23
| 01:301  DT= 1.00 |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
   Surface Area    (ha)=        .23          .00
   Dep. Storage    (mm)=       1.00         4.00
   Average Slope   (%)=        1.00         2.00
   Length          (m)=       10.00          .10
   Mannings n       =          .015         .250

   Max.eff.Inten.(mm/hr)=     72.24        21.08
             over (min)=       1.00         1.00
   Storage Coeff.  (min)=       .80 (ii)   1.16 (ii)
   Unit Hyd. Tpeak (min)=      1.00         1.00
   Unit Hyd. peak  (cms)=      1.22          .98

                                                      *TOTALS*
   PEAK FLOW       (cms)=       .05          .00         .046 (iii)
   TIME TO PEAK    (hrs)=      1.50         1.50        1.500
   RUNOFF VOLUME   (mm)=      34.21         8.41       33.950
   TOTAL RAINFALL  (mm)=      35.21        35.21       35.208
   RUNOFF COEFFICIENT  =        .97          .24         .964

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* =  75.0   Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
-------------------------------------------------------------------------------
002:0005-----------------------------------------------------------------------
*#*****************************************************************************|
*# CATCHMENT 202 - PARKING, DRIVEWAY SURFACE AND LANDSCAPING
*
----------------------
```

```
--------------------
| CALIB STANDHYD   |   Area    (ha)=    .12
| 02:202  DT= 1.00 |   Total Imp(%)=  93.00   Dir. Conn.(%)=  93.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
   Surface Area    (ha)=        .11          .01
   Dep. Storage    (mm)=       1.00         4.00
   Average Slope   (%)=        2.00         2.00
   Length          (m)=       15.00        20.00
   Mannings n       =          .015         .250

   Max.eff.Inten.(mm/hr)=     72.24        14.13
             over (min)=       1.00        11.00
   Storage Coeff.  (min)=       .83 (ii)  11.01 (ii)
   Unit Hyd. Tpeak (min)=      1.00        11.00
   Unit Hyd. peak  (cms)=      1.19          .10

                                                      *TOTALS*
   PEAK FLOW       (cms)=       .02          .00         .022 (iii)
   TIME TO PEAK    (hrs)=      1.50         1.65        1.500
   RUNOFF VOLUME   (mm)=      34.21         8.41       32.402
   TOTAL RAINFALL  (mm)=      35.21        35.21       35.208
   RUNOFF COEFFICIENT  =        .97          .24         .920

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* =  75.0   Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
-------------------------------------------------------------------------------
002:0006-----------------------------------------------------------------------
*#*****************************************************************************|
*# CATCHMENT 203 - LANDSCAPING AT NORTH AND NORTHEAST
*
----------------------
```

```
--------------------
| CALIB NASHYD     |   Area    (ha)=    .06   Curve Number   (CN)=75.00
| 03:203  DT= 1.00 |   Ia      (mm)=   4.000  # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=    .170

   Unit Hyd Qpeak  (cms)=     .013

   PEAK FLOW       (cms)=     .002 (i)
```

```
    TIME TO PEAK    (hrs)=    1.667
    RUNOFF VOLUME   (mm)=     8.399
    TOTAL RAINFALL  (mm)=    35.208
    RUNOFF COEFFICIENT =      .239

   (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
002:0007---------------------------------------------------------
*# TOTAL FLOW FROM ROOF AND SURFACE ROUTED THROUGH SWM STORAGE – 201+202+203
---------------------
| ADD HYD (T-SWM )  | ID: NHYD     AREA    QPEAK   TPEAK   R.V.    DWF
---------------------               (ha)    (cms)   (hrs)   (mm)    (cms)
                 ID1 01:301         .23     .046    1.50   33.95   .000
                +ID2 02:202         .12     .022    1.50   32.40   .000
                +ID3 03:203         .06     .002    1.67    8.40   .000
                                  ===================================
                     SUM 07:T-SWM   .41     .069    1.50   29.76   .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
002:0008---------------------------------------------------------
* ROUTE THROUGH BASEMENT STORAGE TANK C/W 140 MMM ORIIFICE CONTROL
---------------------
| ROUTE RESERVOIR |  Requested routing time step =  1.0 min.
|  IN>07:(T-SWM ) |
|  OUT<08:(TANK ) |  ========= OUTLFOW STORAGE TABLE  =========
---------------------  OUTFLOW    STORAGE      OUTFLOW    STORAGE
                        (cms)     (ha.m.)       (cms)     (ha.m.)
                        .000    .0000E+00        .031    .8100E-02
                        .007    .1000E-03        .034    .9400E-02
                        .017    .1700E-02        .036    .1070E-01
                        .022    .3900E-02        .038    .1170E-01
                        .025    .5000E-02        .041    .1260E-01
                        .028    .6600E-02        .043    .1330E-01

       ROUTING RESULTS      AREA    QPEAK   TPEAK   R.V.
       -------------------   (ha)    (cms)   (hrs)   (mm)
       INFLOW >07: (T-SWM )   .41     .069    1.500   29.758
       OUTFLOW<08: (TANK )    .41     .021    1.667   29.758
       OVERFLOW<09: (OF-TNK)  .00     .000    .000    .000

           TOTAL NUMBER OF SIMULATED OVERFLOWS  =       0
           CUMULATIVE TIME OF OVERFLOWS  (hours)=     .00
           PERCENTAGE OF TIME OVERFLOWING    (%)=     .00

           PEAK  FLOW  REDUCTION [Qout/Qin](%)=  30.913
           TIME SHIFT OF PEAK FLOW      (min)=   10.00
           MAXIMUM STORAGE  USED   (ha.m.)=.3786E-02
```

```
002:0009---------------------------------------------------------
*#****************************************************************|
---------------------
| COMPUTE VOLUME   |
|  ID:07  (T-SWM ) |               DISCHARGE     TIME
---------------------                (cms)       (hrs)
           START CONTROLLING AT       .018       1.333
           INFLOW HYD. PEAKS AT       .069       1.500
           STOP  CONTROLLING AT       .040       1.515

           REQUIRED STORAGE VOLUME (ha.m.)=    .0022
           TOTAL HYDROGRAPH VOLUME (ha.m.)=    .0122
           % OF HYDROGRAPH TO STORE      = 18.3925

       NOTE:  Storage was computed to reduce the Inflow
              peak to   .040  (cms).
```

```
002:0010---------------------------------------------------------
*
*# CATCHMENT 204 – UNCONTROLLED FRONT AREA
*
---------------------
| CALIB STANDHYD  |  Area    (ha)=    .04
| 04:204  DT= 1.00|  Total Imp(%)=  58.00  Dir. Conn.(%)=  58.00
---------------------
                    IMPERVIOUS    PERVIOUS (i)
    Surface Area   (ha)=  .02         .02
    Dep. Storage   (mm)=  1.00        4.00
    Average Slope  (%)=   2.00        2.00
    Length         (m)=   2.00        2.00
    Mannings n     =      .015        .250

    Max.eff.Inten.(mm/hr)=  72.24    20.46
            over (min)=      1.00     2.00
    Storage Coeff. (min)=    .25 (ii) 2.45 (ii)
    Unit Hyd. Tpeak (min)=   1.00     2.00
    Unit Hyd. peak  (cms)=   1.67      .49
                                              *TOTALS*
    PEAK FLOW      (cms)=     .00      .00      .005 (iii)
    TIME TO PEAK   (hrs)=    1.40     1.50     1.500
    RUNOFF VOLUME  (mm)=    34.21     8.41    23.371
    TOTAL RAINFALL (mm)=    35.21    35.21    35.208
    RUNOFF COEFFICIENT =     .97      .24      .664

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 75.0   Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
002:0011---------------------------------------------------------
*#****************************************************************|
*# TOTAL SITE DISCHARGE – CONTORLLED + UNCONTROLLED
---------------------
| ADD HYD (T-CONT )  | ID: NHYD     AREA    QPEAK   TPEAK   R.V.    DWF
---------------------                (ha)    (cms)   (hrs)   (mm)    (cms)
                 ID1 08:TANK         .41     .021    1.67   29.76   .000
                +ID2 09:OF-TNK       .00     .000    .00     .00    .000
                +ID3 04:204          .04     .005    1.50   23.37   .000
                                  ===================================
```

```
                     SUM 10:T-CONT   .45     .026    1.50   29.19   .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
002:0012---------------------------------------------------------
*
*# TOTAL UNCONTROLLED FLOW FROM SITE
---------------------
| ADD HYD (UNCON  )  | ID: NHYD     AREA    QPEAK   TPEAK   R.V.    DWF
---------------------                (ha)    (cms)   (hrs)   (mm)    (cms)
                 ID1 07:T-SWM        .41     .069    1.50   29.76   .000
                +ID2 04:204          .04     .005    1.50   23.37   .000
                                  ===================================
                     SUM 10:UNCON    .45     .075    1.50   29.19   .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
002:0013---------------------------------------------------------
*
* RUN REMAINING DESIGN STORMS (HAMILTON MOUNT HOPE 5 TO 100-YR)
*
  ** END OF RUN :   4

***************************************************************************
```

```
---------------------
| START           |  Project dir.: P:\2022\0285\10\05-DSGN\CIVL\SWM\
---------------------  Rainfall dir.: P:\2022\0285\10\05-DSGN\CIVL\SWM\
   TZERO =   .00 hrs on       0
   METOUT=   2 (output = METRIC)
   NRUN  = 005
   NSTORM=   1
        #  1=NRF4-005.STM
```

```
005:0002---------------------------------------------------------
*#****************************************************************|
*#  Project Name: 66 NORFOLK STREET SOUTH
*#              SIMCOE, ONTARIO
*#  JOB NUMBER : 2022-0285-10
*#     Date    : JULY 2023
*#   Revised   :
*#   Company   : WALTER FEDY
*#     File    : 22-0285A.DAT
*#****************************************************************|
*
```

```
005:0002---------------------------------------------------------
*
---------------------
| READ STORM      |   Filename: NORFOLK 5-YR 4HR CHICAGO STORM
| Ptotal= 49.03 mm|   Comments: NORFOLK 5-YR 4HR CHICAGO STORM
---------------------
        TIME    RAIN     TIME    RAIN     TIME    RAIN     TIME    RAIN
        hrs    mm/hr     hrs    mm/hr     hrs    mm/hr     hrs    mm/hr
        .17    4.171    1.17   12.361    2.17    9.718    3.17    4.963
        .33    4.604    1.33   24.395    2.33    8.234    3.33    4.633
        .50    5.166    1.50   96.032    2.50    7.199    3.50    4.351
        .67    5.928    1.67   28.708    2.67    6.431    3.67    4.107
        .83    7.035    1.83   16.461    2.83    5.834    3.83    3.895
       1.00    8.826    2.00   12.063    3.00    5.356    4.00    3.707
```

```
005:0003---------------------------------------------------------
*
*#****************************************************************|
*#      PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#      ===================================================
*#****************************************************************|
*
*# CATCHMENT 101 – EXISTING SITE CONDITIONS
*
---------------------
| CALIB STANDHYD  |  Area    (ha)=    .45
| 01:101  DT= 1.00|  Total Imp(%)=  54.00  Dir. Conn.(%)=  54.00
---------------------
                    IMPERVIOUS    PERVIOUS (i)
    Surface Area   (ha)=  .24         .21
    Dep. Storage   (mm)=  1.00        4.00
    Average Slope  (%)=    .60        3.00
    Length         (m)=  42.00       32.00
    Mannings n     =      .015        .250

    Max.eff.Inten.(mm/hr)=  96.03    26.29
            over (min)=      2.00    11.00
    Storage Coeff. (min)=   1.96 (ii) 11.29 (ii)
    Unit Hyd. Tpeak (min)=   2.00    11.00
    Unit Hyd. peak  (cms)=    .57      .10
                                              *TOTALS*
    PEAK FLOW      (cms)=     .06      .01      .069 (iii)
    TIME TO PEAK   (hrs)=    1.50     1.65     1.500
    RUNOFF VOLUME  (mm)=    48.03    15.63    33.127
    TOTAL RAINFALL (mm)=    49.03    49.03    49.029
    RUNOFF COEFFICIENT =     .98      .32      .676

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 75.0   Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
005:0004---------------------------------------------------------
*#****************************************************************|
*#****************************************************************|
*#****************************************************************|
*#      POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#      ===================================================
*#****************************************************************|
*
```

```
*# CATCHMENT 201 - PROPOSED BUIDLING ROOF AND RAMP
*
---------------------
| CALIB STANDHYD  |   Area    (ha)=    .23
| 01:301  DT= 1.00|   Total Imp(%)=  99.00  Dir. Conn.(%)=  99.00
---------------------
                       IMPERVIOUS    PERVIOUS (i)
    Surface Area    (ha)=      .23         .00
    Dep. Storage    (mm)=     1.00        4.00
    Average Slope    (%)=     1.00        2.00
    Length           (m)=    10.00         .10
    Mannings n        =       .015        .250

    Max.eff.Inten.(mm/hr)=   96.03       36.96
            over (min)        1.00        1.00
    Storage Coeff.  (min)=     .71 (ii)   1.00 (ii)
    Unit Hyd. Tpeak (min)=    1.00        1.00
    Unit Hyd. peak  (cms)=    1.28        1.07
                                                  *TOTALS*
    PEAK FLOW       (cms)=     .06         .00      .061 (iii)
    TIME TO PEAK    (hrs)=    1.50        1.50     1.500
    RUNOFF VOLUME   (mm)=    48.03       15.63    47.705
    TOTAL RAINFALL  (mm)=    49.03       49.03    49.029
    RUNOFF COEFFICIENT  =      .98         .32      .973

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 75.0   Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

005:0005---------------------------------------------------------------------
*#*************************************************************************|
*# CATCHMENT 202 - PARKING, DRIVEWAY SURFACE AND LANDSCAPING
*
---------------------
| CALIB STANDHYD  |   Area    (ha)=    .12
| 02:202  DT= 1.00|   Total Imp(%)=  93.00  Dir. Conn.(%)=  93.00
---------------------
                       IMPERVIOUS    PERVIOUS (i)
    Surface Area    (ha)=      .11         .01
    Dep. Storage    (mm)=     1.00        4.00
    Average Slope    (%)=     2.00        2.00
    Length           (m)=    15.00       20.00
    Mannings n        =       .015        .250

    Max.eff.Inten.(mm/hr)=   96.03       30.06
            over (min)        1.00        8.00
    Storage Coeff.  (min)=     .74 (ii)   8.27 (ii)
    Unit Hyd. Tpeak (min)=    1.00        8.00
    Unit Hyd. peak  (cms)=    1.26         .14
                                                  *TOTALS*
    PEAK FLOW       (cms)=     .03         .00      .030 (iii)
    TIME TO PEAK    (hrs)=    1.50        1.60     1.500
    RUNOFF VOLUME   (mm)=    48.03       15.63    45.761
    TOTAL RAINFALL  (mm)=    49.03       49.03    49.029
    RUNOFF COEFFICIENT  =      .98         .32      .933

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 75.0   Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

005:0006---------------------------------------------------------------------
*#*************************************************************************|
*# CATCHMENT 203 - LANDSCAPING AT NORTH AND NORTHEAST
*
---------------------
| CALIB NASHYD    |   Area    (ha)=    .06  Curve Number   (CN)=75.00
| 03:203  DT= 1.00|   Ia      (mm)=  4.000  # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=   .170

    Unit Hyd Qpeak  (cms)=     .013

    PEAK FLOW       (cms)=     .003 (i)
    TIME TO PEAK    (hrs)=    1.650
    RUNOFF VOLUME   (mm)=    15.628
    TOTAL RAINFALL  (mm)=    49.029
    RUNOFF COEFFICIENT  =      .319

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

005:0007---------------------------------------------------------------------
*# TOTAL FLOW FROM ROOF AND SURFACE ROUTED THROUGH SWM STORAGE - 201+202+203
---------------------
| ADD HYD (T-SWM  )|  ID: NHYD       AREA     QPEAK    TPEAK    R.V.    DWF
---------------------                (ha)     (cms)    (hrs)    (mm)    (cms)
                      ID1 01:301      .23      .061     1.50    47.71    .000
                     +ID2 02:202      .12      .030     1.50    45.76    .000
                     +ID3 03:203      .06      .003     1.65    15.63    .000
                     =======================================================
                      SUM 07:T-SWM    .41      .093     1.50    42.44    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

005:0008---------------------------------------------------------------------
* ROUTE THROUGH BASEMENT STORAGE TANK C/W 140 MMM ORIIFICE CONTROL
---------------------
| ROUTE RESERVOIR |   Requested routing time step =  1.0 min.
| IN>07:(T-SWM )  |
| OUT<08:(TANK )  |     ========= OUTLFOW STORAGE TABLE  =========
---------------------    OUTFLOW    STORAGE       OUTFLOW    STORAGE
                          (cms)     (ha.m.)        (cms)     (ha.m.)
                           .000    .0000E+00        .031    .8100E-02
                           .007    .1000E-03        .034    .9400E-02
                           .017    .1700E-02        .036    .1070E-01
                           .022    .3900E-02        .038    .1170E-01
                           .025    .5000E-02        .041    .1260E-01
                           .028    .6600E-02        .043    .1330E-01
```

```
    ROUTING RESULTS        AREA    QPEAK    TPEAK     R.V.
    ---------------------  (ha)    (cms)    (hrs)     (mm)
    INFLOW >07: (T-SWM )    .41     .093    1.500    42.442
    OUTFLOW<08: (TANK  )    .41     .026    1.667    42.442
    OVERFLOW<09: (OF-TNK)   .00     .000     .000      .000

         TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
         CUMULATIVE TIME OF OVERFLOWS  (hours) =      .00
         PERCENTAGE OF TIME OVERFLOWING    (%) =      .00


         PEAK  FLOW  REDUCTION [Qout/Qin](%)=  28.375
         TIME SHIFT OF PEAK FLOW     (min)=   10.00
         MAXIMUM  STORAGE   USED   (ha.m.)=.5585E-02

--------------------------------------------------------------------------
005:0009-----------------------------------------------------------------
*#*************************************************************************|
---------------------
| COMPUTE VOLUME   |
| ID:07  (T-SWM ) |            DISCHARGE       TIME
---------------------            (cms)         (hrs)
            START CONTROLLING AT    .012        1.167
            INFLOW HYD. PEAKS AT    .093        1.500
            STOP  CONTROLLING AT    .040        1.524

            REQUIRED STORAGE VOLUME (ha.m.)=    .0037
            TOTAL HYDROGRAPH VOLUME (ha.m.)=    .0174
            % OF HYDROGRAPH TO STORE  =  21.2499

            NOTE:  Storage was computed to reduce the Inflow
                   peak to    .040  (cms).

--------------------------------------------------------------------------
005:0010-----------------------------------------------------------------
*
*# CATCHMENT 204 - UNCONTROLLED FRONT AREA
*
---------------------
| CALIB STANDHYD  |   Area    (ha)=    .04
| 04:204  DT= 1.00|   Total Imp(%)=  58.00  Dir. Conn.(%)=  58.00
---------------------
                       IMPERVIOUS    PERVIOUS (i)
    Surface Area    (ha)=      .02         .02
    Dep. Storage    (mm)=     1.00        4.00
    Average Slope    (%)=     2.00        2.00
    Length           (m)=     2.00        2.00
    Mannings n        =       .015        .250

    Max.eff.Inten.(mm/hr)=   96.03       36.06
            over (min)        1.00        2.00
    Storage Coeff.  (min)=     .22 (ii)   1.98 (ii)
    Unit Hyd. Tpeak (min)=    1.00        2.00
    Unit Hyd. peak  (cms)=    1.68         .56
                                                  *TOTALS*
    PEAK FLOW       (cms)=     .01         .00      .008 (iii)
    TIME TO PEAK    (hrs)=    1.40        1.50     1.500
    RUNOFF VOLUME   (mm)=    48.03       15.63    34.423
    TOTAL RAINFALL  (mm)=    49.03       49.03    49.029
    RUNOFF COEFFICIENT  =      .98         .32      .702

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* = 75.0   Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------
005:0011-----------------------------------------------------------------
*#*************************************************************************|
*# TOTAL SITE DISCHARGE - CONTORLLED + UNCONTROLLED
---------------------
| ADD HYD (T-CONT )|  ID: NHYD       AREA     QPEAK    TPEAK    R.V.    DWF
---------------------                (ha)     (cms)    (hrs)    (mm)    (cms)
                      ID1 08:TANK     .41      .026     1.67    42.44    .000
                     +ID2 09:OF-TNK   .00      .000      .00     .00     .000
                     +ID3 04:204      .04      .008     1.50    34.42    .000
                     =======================================================
                      SUM 10:T-CONT   .45      .033     1.50    41.73    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------
005:0012-----------------------------------------------------------------
*
*# TOTAL UNCONTROLLED FLOW FROM SITE
---------------------
| ADD HYD (UNCON  )|  ID: NHYD       AREA     QPEAK    TPEAK    R.V.    DWF
---------------------                (ha)     (cms)    (hrs)    (mm)    (cms)
                      ID1 07:T-SWM    .41      .093     1.50    42.44    .000
                     +ID2 04:204      .04      .008     1.50    34.42    .000
                     =======================================================
                      SUM 10:UNCON    .45      .100     1.50    41.73    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------
005:0013-----------------------------------------------------------------
*
* RUN REMAINING DESIGN STORMS (HAMILTON MOUNT HOPE 5 TO 100-YR)
*
--------------------------------------------------------------------------
005:0002-----------------------------------------------------------------
*
  ** END OF RUN :   9

**************************************************************************


---------------------
| START           |   Project  dir.: P:\2022\0285\10\05-DSGN\CIVL\SWM\
---------------------   Rainfall dir.: P:\2022\0285\10\05-DSGN\CIVL\SWM\
```

```
      TZERO =   .00 hrs on       0
      METOUT=   2 (output = METRIC)
      NRUN  = 010
      NSTORM=   1
          #  1=NRF4-010.STM
010:0002--------------------------------------------------------------
*#****************************************************************************|
*#  Project Name: 66 NORFOLK STREET SOUTH
*#                SIMCOE, ONTARIO
*#  JOB NUMBER  : 2022-0285-10
*#      Date    : JULY 2023
*#     Revised  :
*#   Company    : WALTER FEDY
*#      File    : 22-0285A.DAT
*#****************************************************************************|
*
010:0002--------------------------------------------------------------
*
   ---------------------
   | READ STORM         |    Filename: NORFOLK 10-YR 4HR CHICAGO STORM
   | Ptotal= 57.94 mm   |    Comments: NORFOLK 10-YR 4HR CHICAGO STORM
   ---------------------
        TIME    RAIN  | TIME    RAIN  | TIME    RAIN  | TIME    RAIN
        hrs    mm/hr  | hrs    mm/hr  | hrs    mm/hr  | hrs    mm/hr
         .17   5.004  | 1.17  14.695  | 2.17  11.578  | 3.17   5.946
         .33   5.520  | 1.33  28.804  | 2.33   9.824  | 3.33   5.554
         .50   6.188  | 1.50 111.838  | 2.50   8.600  | 3.50   5.219
         .67   7.093  | 1.67  33.848  | 2.67   7.689  | 3.67   4.929
         .83   8.406  | 1.83  19.518  | 2.83   6.982  | 3.83   4.675
        1.00  10.525  | 2.00  14.345  | 3.00   6.414  | 4.00   4.451

010:0003--------------------------------------------------------------
*
*#****************************************************************************|
*#         PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#         ===============================================
*#****************************************************************************|
*
*# CATCHMENT 101 - EXISTING SITE CONDITIONS
*
   ---------------------
   | CALIB STANDHYD     |   Area    (ha)=    .45
   | 01:101   DT= 1.00  |   Total Imp(%)=  54.00   Dir. Conn.(%)=  54.00
   ---------------------
                             IMPERVIOUS  PERVIOUS (i)
        Surface Area   (ha)=    .24        .21
        Dep. Storage   (mm)=   1.00       4.00
        Average Slope  (%)=     .60       3.00
        Length         (m)=   42.00      32.00
        Mannings n     =       .015        .250

        Max.eff.Inten.(mm/hr)=  111.84      37.63
               over (min)        2.00      10.00
        Storage Coeff. (min)     1.84 (ii)  9.92 (ii)
        Unit Hyd. Tpeak (min)    2.00      10.00
        Unit Hyd. peak (cms)      .59        .11
                                                      *TOTALS*
        PEAK FLOW     (cms)=     .08        .01       .084 (iii)
        TIME TO PEAK  (hrs)=    1.50       1.63      1.500
        RUNOFF VOLUME  (mm)=   56.94      20.99     40.404
        TOTAL RAINFALL (mm)=   57.94      57.94     57.941
        RUNOFF COEFFICIENT =     .98        .36       .697

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* =  75.0   Ia = Dep. Storage  (Above)
       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
            THAN THE STORAGE COEFFICIENT.
      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

010:0004--------------------------------------------------------------
*#****************************************************************************|
*#****************************************************************************|
*#****************************************************************************|
*#         POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#         ================================================
*#****************************************************************************|
*
*# CATCHMENT 201 - PROPOSED BUIDLING ROOF AND RAMP
*
   ---------------------
   | CALIB STANDHYD     |   Area    (ha)=    .23
   | 01:301   DT= 1.00  |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
   ---------------------
                             IMPERVIOUS  PERVIOUS (i)
        Surface Area   (ha)=    .23        .00
        Dep. Storage   (mm)=   1.00       4.00
        Average Slope  (%)=    1.00       2.00
        Length         (m)=   10.00        .10
        Mannings n     =       .015        .250

        Max.eff.Inten.(mm/hr)=  111.84      48.77
               over (min)        1.00       1.00
        Storage Coeff. (min)      .67 (ii)   .93 (ii)
        Unit Hyd. Tpeak (min)    1.00       1.00
        Unit Hyd. peak (cms)     1.32       1.12
                                                      *TOTALS*
        PEAK FLOW     (cms)=     .07        .00       .071 (iii)
        TIME TO PEAK  (hrs)=    1.50       1.50      1.500
        RUNOFF VOLUME  (mm)=   56.94      20.99     56.581
        TOTAL RAINFALL (mm)=   57.94      57.94     57.941
        RUNOFF COEFFICIENT =     .98        .36       .977

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* =  75.0   Ia = Dep. Storage  (Above)
       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
            THAN THE STORAGE COEFFICIENT.
      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

010:0005--------------------------------------------------------------
*#****************************************************************************|
```

```
*# CATCHMENT 202 - PARKING, DRIVEWAY SURFACE AND LANDSCAPING
*
   ---------------------
   | CALIB STANDHYD     |   Area    (ha)=    .12
   | 02:202   DT= 1.00  |   Total Imp(%)=  93.00   Dir. Conn.(%)=  93.00
   ---------------------
                             IMPERVIOUS  PERVIOUS (i)
        Surface Area   (ha)=    .11        .01
        Dep. Storage   (mm)=   1.00       4.00
        Average Slope  (%)=    2.00       2.00
        Length         (m)=   15.00      20.00
        Mannings n     =       .015        .250

        Max.eff.Inten.(mm/hr)=  111.84      41.76
               over (min)        1.00       7.00
        Storage Coeff. (min)      .69 (ii)  7.30 (ii)
        Unit Hyd. Tpeak (min)    1.00       7.00
        Unit Hyd. peak (cms)     1.30        .16
                                                      *TOTALS*
        PEAK FLOW     (cms)=     .03        .00       .035 (iii)
        TIME TO PEAK  (hrs)=    1.48       1.57      1.500
        RUNOFF VOLUME  (mm)=   56.94      20.99     54.424
        TOTAL RAINFALL (mm)=   57.94      57.94     57.941
        RUNOFF COEFFICIENT =     .98        .36       .939

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* =  75.0   Ia = Dep. Storage  (Above)
       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
            THAN THE STORAGE COEFFICIENT.
      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
010:0006----------------------------------------------------------------------
*#****************************************************************************|
*# CATCHMENT 203 - LANDSCAPING AT NORTH AND NORTHEAST
*
   ---------------------
   | CALIB NASHYD       |   Area    (ha)=    .06   Curve Number   (CN)=75.00
   | 03:203   DT= 1.00  |   Ia      (mm)=   4.000  # of Linear Res.(N)= 3.00
   ---------------------   U.H. Tp(hrs)=    .170

        Unit Hyd Qpeak (cms)=    .013

        PEAK FLOW     (cms)=    .004 (i)
        TIME TO PEAK  (hrs)=   1.650
        RUNOFF VOLUME  (mm)=  20.987
        TOTAL RAINFALL (mm)=  57.941
        RUNOFF COEFFICIENT =    .362

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

------------------------------------------------------------------------------
010:0007----------------------------------------------------------------------
*# TOTAL FLOW FROM ROOF AND SURFACE ROUTED THROUGH SWM STORAGE - 201+202+203
   ---------------------
   | ADD HYD (T-SWM   ) |  ID: NHYD      AREA    QPEAK   TPEAK    R.V.    DWF
   ---------------------                 (ha)    (cms)   (hrs)    (mm)   (cms)
                           ID1 01:301    .23     .071    1.50    56.58   .000
                          +ID2 02:202    .12     .035    1.50    54.42   .000
                          +ID3 03:203    .06     .004    1.65    20.99   .000
                                       =========================================
                           SUM 07:T-SWM  .41     .109    1.50    50.74   .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
010:0008----------------------------------------------------------------------
* ROUTE THROUGH BASEMENT STORAGE TANK C/W 140 MMM ORIIFICE CONTROL
   ---------------------
   | ROUTE RESERVOIR    |   Requested routing time step =  1.0 min.
   |  IN>07:(T-SWM )     |
   | OUT<08:(TANK  )     |   =========  OUTLFOW STORAGE TABLE  =========
   ---------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
                            (cms)      (ha.m.)   |  (cms)      (ha.m.)
                            .000   .0000E+00     |   .031   .8100E-02
                            .007   .1000E-03     |   .034   .9400E-02
                            .017   .1700E-02     |   .036   .1070E-01
                            .022   .3900E-02     |   .038   .1170E-01
                            .025   .5000E-02     |   .041   .1260E-01
                            .028   .6600E-02     |   .043   .1330E-01

        ROUTING RESULTS         AREA     QPEAK    TPEAK     R.V.
        ---------------         (ha)     (cms)    (hrs)     (mm)
        INFLOW >07: (T-SWM )    .41      .109    1.500    50.741
        OUTFLOW<08: (TANK  )    .41      .029    1.683    50.741
        OVERFLOW<09: (OF-TNK)   .00      .000     .000     .000

             TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
             CUMULATIVE TIME OF OVERFLOWS  (hours) =      .00
             PERCENTAGE OF TIME OVERFLOWING    (%) =      .00

             PEAK  FLOW   REDUCTION [Qout/Qin](%)=  26.672
             TIME SHIFT OF PEAK FLOW      (min)=    11.00
             MAXIMUM STORAGE   USED   (ha.m.)=.6946E-02

------------------------------------------------------------------------------
010:0009----------------------------------------------------------------------
*#****************************************************************************|
   ---------------------
   | COMPUTE VOLUME     |
   | ID:07  (T-SWM )    |          DISCHARGE      TIME
   ---------------------            (cms)        (hrs)
             START CONTROLLING AT    .014       1.165
             INFLOW HYD. PEAKS AT    .109       1.500
             STOP  CONTROLLING AT    .040       1.533

             REQUIRED STORAGE VOLUME (ha.m.)=   .0048
             TOTAL HYDROGRAPH VOLUME (ha.m.)=   .0208
             % OF HYDROGRAPH TO STORE    =  23.1194

        NOTE:  Storage was computed to reduce the Inflow
               peak to   .040  (cms).

------------------------------------------------------------------------------
```

```
010:0010-------------------------------------------------------------------
*
*# CATCHMENT 204 - UNCONTROLLED FRONT AREA
*
----------------------
| CALIB STANDHYD  |   Area      (ha)=    .04
| 04:204  DT= 1.00 |  Total Imp(%)=  58.00  Dir. Conn.(%)=  58.00
----------------------
                           IMPERVIOUS     PERVIOUS (i)
      Surface Area    (ha)=      .02          .02
      Dep. Storage    (mm)=     1.00         4.00
      Average Slope    (%)=     2.00         2.00
      Length           (m)=     2.00         2.00
      Mannings n        =       .015         .250

      Max.eff.Inten.(mm/hr)=  111.84        47.70
             over (min)        1.00         2.00
      Storage Coeff.  (min)=    .21 (ii)    1.78 (ii)
      Unit Hyd. Tpeak (min)=   1.00         2.00
      Unit Hyd. peak  (cms)=   1.69          .60
                                                        *TOTALS*
      PEAK FLOW       (cms)=    .01          .00        .009 (iii)
      TIME TO PEAK    (hrs)=   1.40         1.50       1.500
      RUNOFF VOLUME   (mm)=   56.94        20.99      41.842
      TOTAL RAINFALL  (mm)=   57.94        57.94      57.941
      RUNOFF COEFFICIENT  =     .98          .36        .722

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* =  75.0    Ia = Dep. Storage  (Above)
       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
            THAN THE STORAGE COEFFICIENT.
      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

010:0011-------------------------------------------------------------------
*#*******************************************************************|
*# TOTAL SITE DISCHARGE - CONTORLLED + UNCONTROLLED
----------------------
| ADD HYD (T-CONT ) |  ID: NHYD     AREA    QPEAK   TPEAK   R.V.    DWF
----------------------              (ha)    (cms)   (hrs)   (mm)   (cms)
                    ID1 08:TANK      .41     .029    1.68   50.74   .000
                   +ID2 09:OF-TNK    .00     .000     .00     .00   .000
                   +ID3 04:204       .04     .009    1.50   41.84   .000
                                   ===================================
                    SUM 10:T-CONT    .45     .037    1.50   49.95   .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

010:0012-------------------------------------------------------------------
*
*# TOTAL UNCONTROLLED FLOW FROM SITE
----------------------
| ADD HYD (UNCON  ) |  ID: NHYD     AREA    QPEAK   TPEAK   R.V.    DWF
----------------------              (ha)    (cms)   (hrs)   (mm)   (cms)
                    ID1 07:T-SWM     .41     .109    1.50   50.74   .000
                   +ID2 04:204       .04     .009    1.50   41.84   .000
                                   ===================================
                    SUM 10:UNCON     .45     .118    1.50   49.95   .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

010:0013-------------------------------------------------------------------
*
* RUN REMAINING DESIGN STORMS (HAMILTON MOUNT HOPE 5 TO 100-YR)
*
-------------------------------------------------------------------
010:0002-------------------------------------------------------------------
*
-------------------------------------------------------------------
010:0002-------------------------------------------------------------------
*
  ** END OF RUN :  24

*******************************************************************************

----------------------
| START           | Project dir.: P:\2022\0285\10\05-DSGN\CIVL\SWM\
----------------------  Rainfall dir.: P:\2022\0285\10\05-DSGN\CIVL\SWM\
    TZERO =   .00 hrs on       0
    METOUT=   2 (output = METRIC)
    NRUN  = 025
    NSTORM=   1
         #  1=NRF4-025.STM
-------------------------------------------------------------------
025:0002-------------------------------------------------------------------
*#*******************************************************************|
*# Project Name: 66 NORFOLK STREET SOUTH
*#            SIMCOE, ONTARIO
*#  JOB NUMBER  : 2022-0285-10
*#     Date     : JULY 2023
*#    Revised   :
*#   Company    : WALTER FEDY
*#     File     : 22-0285A.DAT
*#*******************************************************************|
*
-------------------------------------------------------------------
025:0002-------------------------------------------------------------------
*
--------------------
| READ STORM       |  Filename: NORFOLK 25-YR 4HR CHICAGO STORM
| Ptotal= 69.37 mm |  Comments: NORFOLK 25-YR 4HR CHICAGO STORM
--------------------
        TIME    RAIN  | TIME    RAIN  | TIME    RAIN  | TIME    RAIN
        hrs    mm/hr  | hrs    mm/hr  | hrs    mm/hr  | hrs    mm/hr
        .17    6.290  | 1.17  17.632  | 2.17  14.058  | 3.17   7.426
        .33    6.913  | 1.33  33.366  | 2.33  12.019  | 3.33   6.954
        .50    7.716  | 1.50 131.625  | 2.50  10.582  | 3.50   6.549
        .67    8.797  | 1.67  38.939  | 2.67   9.506  | 3.67   6.199
        .83   10.353  | 1.83  23.084  | 2.83   8.665  | 3.83   5.891
```

```
        1.00  12.835  | 2.00  17.238  | 3.00   7.987  | 4.00   5.618
-------------------------------------------------------------------
025:0003-------------------------------------------------------------------
*
*#*******************************************************************|
*#      PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#      =================================================
*#*******************************************************************|
*
*# CATCHMENT 101 - EXISTING SITE CONDITIONS
*
----------------------
| CALIB STANDHYD  |   Area      (ha)=    .45
| 01:101  DT= 1.00 |  Total Imp(%)=  54.00  Dir. Conn.(%)=  54.00
----------------------
                           IMPERVIOUS     PERVIOUS (i)
      Surface Area    (ha)=      .24          .21
      Dep. Storage    (mm)=     1.00         4.00
      Average Slope    (%)=      .60         3.00
      Length           (m)=    42.00        32.00
      Mannings n        =       .015         .250

      Max.eff.Inten.(mm/hr)=  131.63        53.08
             over (min)        2.00         9.00
      Storage Coeff.  (min)=   1.73 (ii)    8.77 (ii)
      Unit Hyd. Tpeak (min)=   2.00         9.00
      Unit Hyd. peak  (cms)=    .61          .13
                                                        *TOTALS*
      PEAK FLOW       (cms)=    .09          .02        .102 (iii)
      TIME TO PEAK    (hrs)=   1.50         1.60       1.500
      RUNOFF VOLUME   (mm)=   68.37        28.48      50.024
      TOTAL RAINFALL  (mm)=   69.37        69.37      69.374
      RUNOFF COEFFICIENT  =     .99          .41        .721

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* =  75.0    Ia = Dep. Storage  (Above)
       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
            THAN THE STORAGE COEFFICIENT.
      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

025:0004-------------------------------------------------------------------
*#*******************************************************************|
*#*******************************************************************|
*#*******************************************************************|
*#      POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#      ==================================================
*#*******************************************************************|
*
*# CATCHMENT 201 - PROPOSED BUIDLING ROOF AND RAMP
*
----------------------
| CALIB STANDHYD  |   Area      (ha)=    .23
| 01:301  DT= 1.00 |  Total Imp(%)=  99.00  Dir. Conn.(%)=  99.00
----------------------
                           IMPERVIOUS     PERVIOUS (i)
      Surface Area    (ha)=      .23          .00
      Dep. Storage    (mm)=     1.00         4.00
      Average Slope    (%)=     1.00         2.00
      Length           (m)=    10.00          .10
      Mannings n        =       .015         .250

      Max.eff.Inten.(mm/hr)=  131.63        64.79
             over (min)        1.00         1.00
      Storage Coeff.  (min)=    .63 (ii)     .86 (ii)
      Unit Hyd. Tpeak (min)=   1.00         1.00
      Unit Hyd. peak  (cms)=   1.35         1.17
                                                        *TOTALS*
      PEAK FLOW       (cms)=    .08          .00        .084 (iii)
      TIME TO PEAK    (hrs)=   1.48         1.50       1.500
      RUNOFF VOLUME   (mm)=   68.37        28.48      67.975
      TOTAL RAINFALL  (mm)=   69.37        69.37      69.374
      RUNOFF COEFFICIENT  =     .99          .41        .980

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* =  75.0    Ia = Dep. Storage  (Above)
       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
            THAN THE STORAGE COEFFICIENT.
      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

025:0005-------------------------------------------------------------------
*#*******************************************************************|
*# CATCHMENT 202 - PARKING, DRIVEWAY SURFACE AND LANDSCAPING
*
----------------------
| CALIB STANDHYD  |   Area      (ha)=    .12
| 02:202  DT= 1.00 |  Total Imp(%)=  93.00  Dir. Conn.(%)=  93.00
----------------------
                           IMPERVIOUS     PERVIOUS (i)
      Surface Area    (ha)=      .11          .01
      Dep. Storage    (mm)=     1.00         4.00
      Average Slope    (%)=     2.00         2.00
      Length           (m)=    15.00        20.00
      Mannings n        =       .015         .250

      Max.eff.Inten.(mm/hr)=  131.63        57.93
             over (min)        1.00         6.00
      Storage Coeff.  (min)=    .65 (ii)    6.44 (ii)
      Unit Hyd. Tpeak (min)=   1.00         6.00
      Unit Hyd. peak  (cms)=   1.34          .18
                                                        *TOTALS*
      PEAK FLOW       (cms)=    .04          .00        .042 (iii)
      TIME TO PEAK    (hrs)=   1.48         1.55       1.500
      RUNOFF VOLUME   (mm)=   68.37        28.48      65.581
      TOTAL RAINFALL  (mm)=   69.37        69.37      69.374
      RUNOFF COEFFICIENT  =     .99          .41        .945

        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN* =  75.0    Ia = Dep. Storage  (Above)
       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
            THAN THE STORAGE COEFFICIENT.
      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
-------------------------------------------------------------------            ------------------------------------------------------------------
025:0006-----------------------------------------------------------                 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
*#################################################################|            ------------------------------------------------------------------
*# CATCHMENT 203 - LANDSCAPING AT NORTH AND NORTHEAST              |            025:0011-----------------------------------------------------------
*                                                                             *#################################################################|
-------------------                                                           *# TOTAL SITE DISCHARGE - CONTORLLED + UNCONTROLLED              |
| CALIB NASHYD    |  Area    (ha)=    .06  Curve Number  (CN)=75.00           *
| 03:203  DT= 1.00|  Ia      (mm)=  4.000  # of Linear Res.(N)= 3.00          -------------------
-------------------  U.H. Tp(hrs)=   .170                                     | ADD HYD (T-CONT  ) | ID: NHYD      AREA    QPEAK   TPEAK   R.V.   DWF
                                                                              -------------------                 (ha)    (cms)   (hrs)   (mm)   (cms)
     Unit Hyd Qpeak (cms)=    .013                                                              ID1 08:TANK       .41    .032    1.68   61.49  .000
                                                                                               +ID2 09:OF-TNK     .00    .000     .00    .00   .000
     PEAK FLOW      (cms)=    .005 (i)                                                          +ID3 04:204        .04    .011    1.50   51.62  .000
     TIME TO PEAK   (hrs)=  1.633                                                               ========================================================
     RUNOFF VOLUME  (mm)=  28.479                                                               SUM 10:T-CONT      .45    .041    1.50   60.62  .000
     TOTAL RAINFALL (mm)=  69.374
     RUNOFF COEFFICIENT =    .411                                                NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.                          ------------------------------------------------------------------
                                                                              025:0012-----------------------------------------------------------
-------------------------------------------------------------------           *#################################################################|
025:0007-----------------------------------------------------------           *# TOTAL UNCONTROLLED FLOW FROM SITE                             |
*# TOTAL FLOW FROM ROOF AND SURFACE ROUTED THROUGH SWM STORAGE - 201+202+203  *
                                                                              -------------------
-------------------                                                           | ADD HYD (UNCON   ) | ID: NHYD      AREA    QPEAK   TPEAK   R.V.   DWF
| ADD HYD (T-SWM   ) | ID: NHYD      AREA    QPEAK   TPEAK   R.V.   DWF        -------------------                 (ha)    (cms)   (hrs)   (mm)   (cms)
-------------------                 (ha)    (cms)   (hrs)   (mm)   (cms)                        ID1 07:T-SWM      .41    .129    1.50   61.49  .000
                 ID1 01:301         .23    .084    1.50   67.97  .000                          +ID2 04:204        .04    .011    1.50   51.62  .000
                +ID2 02:202         .12    .042    1.50   65.58  .000                          ========================================================
                +ID3 03:203         .06    .005    1.63   28.48  .000                          SUM 10:UNCON       .45    .140    1.50   60.62  .000
                 ========================================================
                 SUM 07:T-SWM       .41    .129    1.50   61.49  .000            NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.                         ------------------------------------------------------------------
                                                                              025:0013-----------------------------------------------------------
-------------------------------------------------------------------           *
025:0008-----------------------------------------------------------           * RUN REMAINING DESIGN STORMS (HAMILTON MOUNT HOPE 5 TO 100-YR)
* ROUTE THROUGH BASEMENT STORAGE TANK C/W 140 MMM ORIIFICE CONTROL            *
-------------------                                                           ------------------------------------------------------------------
| ROUTE RESERVOIR  |  Requested routing time step =  1.0 min.                 025:0002-----------------------------------------------------------
| IN>07:(T-SWM )   |                                                          *
| OUT<08:(TANK )   |  ========= OUTLFOW STORAGE TABLE =========               ------------------------------------------------------------------
-------------------   OUTFLOW    STORAGE    OUTFLOW    STORAGE                 025:0002-----------------------------------------------------------
                      (cms)      (ha.m.)    (cms)      (ha.m.)                 *
                      .000    .0000E+00     .031   .8100E-02                   ------------------------------------------------------------------
                      .007    .1000E-03     .034   .9400E-02                   025:0002-----------------------------------------------------------
                      .017    .1700E-02     .036   .1070E-01                   *
                      .022    .3900E-02     .038   .1170E-01                      ** END OF RUN :  49
                      .025    .5000E-02     .041   .1260E-01
                      .028    .6600E-02     .043   .1330E-01               ********************************************************************

     ROUTING RESULTS         AREA    QPEAK   TPEAK    R.V.
     -------------------     (ha)    (cms)   (hrs)    (mm)
     INFLOW >07: (T-SWM )    .41     .129    1.500    61.494
     OUTFLOW<08: (TANK )     .41     .032    1.683    61.494
     OVERFLOW<09: (OF-TNK)   .00     .000     .000     .000                -------------------
                                                                          | START            |  Project dir.: P:\2022\0285\10\05-DSGN\CIVL\SWM\
          TOTAL NUMBER OF SIMULATED OVERFLOWS =       0                   -------------------        Rainfall dir.: P:\2022\0285\10\05-DSGN\CIVL\SWM\
          CUMULATIVE TIME OF OVERFLOWS  (hours)=     .00                      TZERO =  .00 hrs on       0
          PERCENTAGE OF TIME OVERFLOWING   (%)=     .00                       METOUT=   2 (output = METRIC)
                                                                             NRUN  = 050
                                                                             NSTORM=   1
          PEAK  FLOW   REDUCTION [Qout/Qin](%)=   25.023                         #  1=NRF4-050.STM
          TIME SHIFT OF PEAK FLOW        (min)=   11.00                    ------------------------------------------------------------------
          MAXIMUM  STORAGE   USED   (ha.m.)=.8603E-02                      050:0002-----------------------------------------------------------
                                                                          *#################################################################|
-------------------------------------------------------------------       *# Project Name: 66 NORFOLK STREET SOUTH                          |
025:0009-----------------------------------------------------------       *#              SIMCOE, ONTARIO                                   |
*#################################################################|       *# JOB NUMBER  : 2022-0285-10                                     |
-------------------                                                        *#   Date      : JULY 2023                                        |
| COMPUTE VOLUME   |                                                       *#   Revised   :                                                 |
| ID:07  (T-SWM )  |            DISCHARGE      TIME                        *#   Company   : WALTER FEDY                                      |
-------------------              (cms)         (hrs)                       *#   File      : 22-0285A.DAT                                     |
          START CONTROLLING AT    .017        1.167                       *#################################################################|
          INFLOW HYD. PEAKS AT    .129        1.500                       *
          STOP  CONTROLLING AT    .040        1.670                       ------------------------------------------------------------------
                                                                          050:0002-----------------------------------------------------------
          REQUIRED STORAGE VOLUME (ha.m.)=   .0068                        *
          TOTAL HYDROGRAPH VOLUME (ha.m.)=   .0252                        -------------------
          % OF HYDROGRAPH TO STORE      =  27.0476                        | READ STORM       |   Filename: NORFOLK 50-YR 4HR CHICAGO STORM
                                                                          | Ptotal= 78.31 mm |   Comments: NORFOLK 50-YR 4HR CHICAGO STORM
          NOTE:  Storage was computed to reduce the Inflow                -------------------
                 peak to    .040  (cms).                                             TIME    RAIN    TIME    RAIN    TIME    RAIN    TIME    RAIN
                                                                                    hrs     mm/hr   hrs     mm/hr   hrs     mm/hr   hrs     mm/hr
-------------------------------------------------------------------                 .17    7.300    1.17   19.969   2.17   16.022   3.17   8.591
025:0010-----------------------------------------------------------                 .33    8.009    1.33   37.058   2.33   13.752   3.33   8.055
*                                                                                   .50    8.918    1.50  146.499   2.50   12.145   3.50   7.596
*# CATCHMENT 204 - UNCONTROLLED FRONT AREA                                           .67   10.139    1.67   43.072   2.67   10.937   3.67   7.197
*                                                                                   .83   11.888    1.83   25.944   2.83    9.990   3.83   6.847
-------------------                                                                1.00   14.660    2.00   19.537   3.00    9.225   4.00   6.536
| CALIB STANDHYD   |  Area    (ha)=    .04
| 04:204  DT= 1.00 |  Total Imp(%)=  58.00  Dir. Conn.(%)=  58.00         ------------------------------------------------------------------
-------------------                                                       050:0003-----------------------------------------------------------
                      IMPERVIOUS    PERVIOUS (i)                          *
     Surface Area     (ha)=    .02         .02                            *#################################################################|
     Dep. Storage     (mm)=   1.00        4.00                            *#    PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING              |
     Average Slope    (%)=    2.00        2.00                            *#    ===============================================            |
     Length           (m)=    2.00        2.00                            *#################################################################|
     Mannings n       =      .015         .250                            *
                                                                          *# CATCHMENT 101 - EXISTING SITE CONDITIONS
     Max.eff.Inten.(mm/hr)=  131.63       63.52                           *
            over (min)      1.00        2.00                              -------------------
     Storage Coeff.  (min)=   .19 (ii)   1.60 (ii)                        | CALIB STANDHYD   |  Area    (ha)=    .45
     Unit Hyd. Tpeak (min)=  1.00        2.00                             | 01:101  DT= 1.00 |  Total Imp(%)=  54.00  Dir. Conn.(%)=  54.00
     Unit Hyd. peak  (cms)=  1.69         .64                             -------------------
                                                *TOTALS*                                       IMPERVIOUS    PERVIOUS (i)
     PEAK FLOW       (cms)=    .01         .00        .011 (iii)               Surface Area     (ha)=    .24         .21
     TIME TO PEAK    (hrs)=  1.38        1.50       1.500                      Dep. Storage     (mm)=   1.00        4.00
     RUNOFF VOLUME   (mm)=  68.37       28.48      51.620                      Average Slope    (%)=     .60        3.00
     TOTAL RAINFALL  (mm)=  69.37       69.37      69.374                      Length           (m)=   42.00       32.00
     RUNOFF COEFFICIENT =     .99         .41        .744                      Mannings n       =      .015         .250

     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:                            Max.eff.Inten.(mm/hr)=  146.50       66.48
         CN* =   75.0    Ia = Dep. Storage  (Above)                                   over (min)      2.00        8.00
    (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL                             Storage Coeff.  (min)=  1.66 (ii)   8.09 (ii)
         THAN THE STORAGE COEFFICIENT.                                         Unit Hyd. Tpeak (min)=  2.00        8.00
                                                                              Unit Hyd. peak  (cms)=   .63         .14
```

```
        PEAK FLOW      (cms)=       .10         .02          .118 (iii)
        TIME TO PEAK   (hrs)=      1.50        1.58         1.500
        RUNOFF VOLUME  (mm)=      77.31       34.74        57.729
        TOTAL RAINFALL (mm)=      78.31       78.31        78.314
        RUNOFF COEFFICIENT =       .99         .44          .737

         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* =  75.0    Ia = Dep. Storage  (Above)
        (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
             THAN THE STORAGE COEFFICIENT.
       (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
050:0004-------------------------------------------------------------------
*#****************************************************************************
*#****************************************************************************
*#****************************************************************************
*#       POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#       =======================================
*#****************************************************************************
*
*# CATCHMENT 201 - PROPOSED BUIDLING ROOF AND RAMP
*
----------------------
| CALIB STANDHYD  |  Area     (ha)=    .23
| 01:301  DT= 1.00 |  Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
----------------------
                            IMPERVIOUS    PERVIOUS (i)
        Surface Area   (ha)=      .23          .00
        Dep. Storage   (mm)=     1.00         4.00
        Average Slope  (%)=      1.00         2.00
        Length         (m)=     10.00          .10
        Mannings n      =        .015         .250

        Max.eff.Inten.(mm/hr)=  146.50        77.66
                 over (min)=      1.00         1.00
        Storage Coeff.  (min)=    .60 (ii)     .81 (ii)
        Unit Hyd. Tpeak (min)=   1.00         1.00
        Unit Hyd. peak  (cms)=   1.38         1.20
                                                      *TOTALS*
        PEAK FLOW      (cms)=       .09         .00          .093 (iii)
        TIME TO PEAK   (hrs)=      1.48        1.50         1.500
        RUNOFF VOLUME  (mm)=      77.31       34.74        76.888
        TOTAL RAINFALL (mm)=      78.31       78.31        78.314
        RUNOFF COEFFICIENT =       .99         .44          .982

         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* =  75.0    Ia = Dep. Storage  (Above)
        (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
             THAN THE STORAGE COEFFICIENT.
       (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
050:0005-------------------------------------------------------------------
*#****************************************************************************
*# CATCHMENT 202 - PARKING, DRIVEWAY SURFACE AND LANDSCAPING
*
----------------------
| CALIB STANDHYD  |  Area     (ha)=    .12
| 02:202  DT= 1.00 |  Total Imp(%)=  93.00   Dir. Conn.(%)=  93.00
----------------------
                            IMPERVIOUS    PERVIOUS (i)
        Surface Area   (ha)=      .11          .01
        Dep. Storage   (mm)=     1.00         4.00
        Average Slope  (%)=      2.00         2.00
        Length         (m)=     15.00        20.00
        Mannings n      =        .015         .250

        Max.eff.Inten.(mm/hr)=  146.50        70.03
                 over (min)=      1.00         6.00
        Storage Coeff.  (min)=    .62 (ii)    5.99 (ii)
        Unit Hyd. Tpeak (min)=   1.00         6.00
        Unit Hyd. peak  (cms)=   1.36          .19
                                                      *TOTALS*
        PEAK FLOW      (cms)=       .05         .00          .046 (iii)
        TIME TO PEAK   (hrs)=      1.48        1.55         1.500
        RUNOFF VOLUME  (mm)=      77.31       34.74        74.334
        TOTAL RAINFALL (mm)=      78.31       78.31        78.314
        RUNOFF COEFFICIENT =       .99         .44          .949

         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* =  75.0    Ia = Dep. Storage  (Above)
        (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
             THAN THE STORAGE COEFFICIENT.
       (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
050:0006-------------------------------------------------------------------
*#****************************************************************************
*# CATCHMENT 203 - LANDSCAPING AT NORTH AND NORTHEAST
*
----------------------
| CALIB NASHYD   |  Area     (ha)=    .06   Curve Number  (CN)=75.00
| 03:203  DT= 1.00 |  Ia       (mm)=   4.000  # of Linear Res.(N)= 3.00
----------------------  U.H. Tp(hrs)=    .170

        Unit Hyd Qpeak  (cms)=     .013

        PEAK FLOW      (cms)=      .006 (i)
        TIME TO PEAK   (hrs)=     1.633
        RUNOFF VOLUME  (mm)=     34.732
        TOTAL RAINFALL (mm)=     78.314
        RUNOFF COEFFICIENT =       .444

         (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
050:0007-------------------------------------------------------------------
*# TOTAL FLOW FROM ROOF AND SURFACE ROUTED THROUGH SWM STORAGE - 201+202+203
*
----------------------
| ADD HYD (T-SWM  ) |  ID: NHYD      AREA     QPEAK   TPEAK   R.V.    DWF
----------------------                (ha)    (cms)   (hrs)   (mm)   (cms)
                       ID1 01:301     .23     .093    1.50   76.89    .000
                      +ID2 02:202     .12     .046    1.50   74.33    .000
```

```
                      +ID3 03:203     .06     .006    1.63   34.73    .000
                    =======================================================
                       SUM 07:T-SWM   .41     .144    1.50   69.97    .000

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
050:0008-------------------------------------------------------------------
* ROUTE THROUGH BASEMENT STORAGE TANK C/W 140 MMM ORIIFICE CONTROL
----------------------
| ROUTE RESERVOIR  |   Requested routing time step =  1.0 min.
|  IN>07:(T-SWM )  |
| OUT<08:(TANK  )  |   ========= OUTLFOW STORAGE TABLE =========
----------------------    OUTFLOW    STORAGE       OUTFLOW    STORAGE
                           (cms)     (ha.m.)        (cms)     (ha.m.)
                           .000    .0000E+00         .031    .8100E-02
                           .007    .1000E-03         .034    .9400E-02
                           .017    .1700E-02         .036    .1070E-01
                           .022    .3900E-02         .038    .1170E-01
                           .025    .5000E-02         .041    .1260E-01
                           .028    .6600E-02         .043    .1330E-01

          ROUTING RESULTS          AREA    QPEAK    TPEAK     R.V.
          -------------------       (ha)   (cms)    (hrs)     (mm)
          INFLOW >07: (T-SWM )      .41    .144     1.500   69.971
          OUTFLOW<08: (TANK  )      .41    .035     1.683   69.971
          OVERFLOW<09: (OF-TNK)     .00    .000      .000     .000

                 TOTAL NUMBER OF SIMULATED OVERFLOWS  =       0
                 CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
                 PERCENTAGE OF TIME OVERFLOWING    (%)=      .00


                 PEAK   FLOW   REDUCTION [Qout/Qin](%)=   24.142
                 TIME SHIFT OF PEAK FLOW      (min)=      11.00
                 MAXIMUM STORAGE   USED    (ha.m.)=.9926E-02
```

```
050:0009-------------------------------------------------------------------
*#****************************************************************************
----------------------
| COMPUTE VOLUME   |
| ID:07  (T-SWM )  |                 DISCHARGE       TIME
----------------------                 (cms)         (hrs)
            START CONTROLLING AT   .014          .997
            INFLOW HYD. PEAKS AT   .144         1.500
            STOP  CONTROLLING AT   .040         1.677

            REQUIRED STORAGE VOLUME (ha.m.)=    .0081
            TOTAL HYDROGRAPH VOLUME (ha.m.)=    .0287
            % OF HYDROGRAPH TO STORE     =   28.0776

       NOTE:  Storage was computed to reduce the Inflow
              peak to    .040  (cms).
```

```
050:0010-------------------------------------------------------------------
*
*# CATCHMENT 204 - UNCONTROLLED FRONT AREA
*
----------------------
| CALIB STANDHYD  |  Area     (ha)=    .04
| 04:204  DT= 1.00 |  Total Imp(%)=  58.00   Dir. Conn.(%)=  58.00
----------------------
                            IMPERVIOUS    PERVIOUS (i)
        Surface Area   (ha)=      .02          .02
        Dep. Storage   (mm)=     1.00         4.00
        Average Slope  (%)=      2.00         2.00
        Length         (m)=      2.00         2.00
        Mannings n      =        .015         .250

        Max.eff.Inten.(mm/hr)=  146.50        77.66
                 over (min)=      1.00         1.00
        Storage Coeff.  (min)=    .19 (ii)    1.48 (ii)
        Unit Hyd. Tpeak (min)=   1.00         1.00
        Unit Hyd. peak  (cms)=   1.69          .83
                                                      *TOTALS*
        PEAK FLOW      (cms)=       .01         .00          .013 (iii)
        TIME TO PEAK   (hrs)=      1.38        1.50         1.500
        RUNOFF VOLUME  (mm)=      77.31       34.74        59.431
        TOTAL RAINFALL (mm)=      78.31       78.31        78.314
        RUNOFF COEFFICIENT =       .99         .44          .759

         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN* =  75.0    Ia = Dep. Storage  (Above)
        (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
             THAN THE STORAGE COEFFICIENT.
       (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
050:0011-------------------------------------------------------------------
*#****************************************************************************
*# TOTAL SITE DISCHARGE - CONTORLLED + UNCONTROLLED
----------------------
| ADD HYD (T-CONT  ) |  ID: NHYD      AREA     QPEAK   TPEAK   R.V.    DWF
----------------------                (ha)    (cms)   (hrs)   (mm)   (cms)
                       ID1 08:TANK    .41     .035    1.68   69.97    .000
                      +ID2 09:OF-TNK  .00     .000     .00     .00    .000
                      +ID3 04:204     .04     .013    1.50   59.43    .000
                    =======================================================
                       SUM 10:T-CONT  .45     .045    1.50   69.03    .000

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
```

```
050:0012-------------------------------------------------------------------
*
*# TOTAL UNCONTROLLED FLOW FROM SITE
----------------------
| ADD HYD (UNCON  ) |  ID: NHYD      AREA     QPEAK   TPEAK   R.V.    DWF
----------------------                (ha)    (cms)   (hrs)   (mm)   (cms)
                       ID1 07:T-SWM   .41     .144    1.50   69.97    .000
                      +ID2 04:204     .04     .013    1.50   59.43    .000
                    =======================================================
                       SUM 10:UNCON   .45     .157    1.50   69.03    .000
```

```
  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
050:0013----------------------------------------------------------------------
*
* RUN REMAINING DESIGN STORMS (HAMILTON MOUNT HOPE 5 TO 100-YR)
*
050:0002----------------------------------------------------------------------
*
-------------------------------------------------------------------------------
050:0002----------------------------------------------------------------------
*
-------------------------------------------------------------------------------
050:0002----------------------------------------------------------------------
*
-------------------------------------------------------------------------------
050:0002----------------------------------------------------------------------
*
  ** END OF RUN :  99

*******************************************************************************


---------------------
| START             |   Project  dir.: P:\2022\0285\10\05-DSGN\CIVL\SWM\
---------------------   Rainfall dir.: P:\2022\0285\10\05-DSGN\CIVL\SWM\
   TZERO =   .00 hrs on      0
   METOUT=   2 (output = METRIC)
   NRUN = 100
   NSTORM=   1
       #  1=NRF4-100.STM

100:0002----------------------------------------------------------------------
*#***********************************************************************|
*#  Project Name: 66 NORFOLK STREET SOUTH
*#              SIMCOE, ONTARIO
*#  JOB NUMBER  : 2022-0285-10
*#     Date     : JULY 2023
*#    Revised   :
*#    Company   : WALTER FEDY
*#     File     : 22-0285A.DAT
*#***********************************************************************|
*
-------------------------------------------------------------------------------
100:0002----------------------------------------------------------------------
*
---------------------
| READ STORM        |   Filename: NORFOLK 100-YR 4HR CHICAGO STORM
| Ptotal= 87.08 mm  |   Comments: NORFOLK 100-YR 4HR CHICAGO STORM
---------------------
      TIME    RAIN  | TIME    RAIN  | TIME    RAIN  | TIME    RAIN
      hrs   mm/hr   | hrs   mm/hr   | hrs   mm/hr   | hrs   mm/hr
      .17    8.338    1.17  22.251    2.17  17.966    3.17   9.778
      .33    9.129    1.33  40.454    2.33  15.482    3.33   9.181
      .50   10.142    1.50 160.972    2.50  13.715    3.50   8.668
      .67   11.498    1.67  46.813    2.67  12.382    3.67   8.222
      .83   13.431    1.83  28.681    2.83  11.333    3.83   7.830
     1.00   16.477    2.00  21.787    3.00  10.483    4.00   7.481

-------------------------------------------------------------------------------
100:0003----------------------------------------------------------------------
*
*#***********************************************************************|
*#        PRE-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ================================================
*#***********************************************************************|
*
*# CATCHMENT 101 - EXISTING SITE CONDITIONS
*
---------------------
| CALIB STANDHYD    |   Area    (ha)=    .45
| 01:101   DT= 1.00 |   Total Imp(%)=  54.00   Dir. Conn.(%)=  54.00
---------------------
                       IMPERVIOUS   PERVIOUS (i)
   Surface Area   (ha)=     .24          .21
   Dep. Storage   (mm)=    1.00         4.00
   Average Slope   (%)=     .60         3.00
   Length          (m)=   42.00        32.00
   Mannings n       =      .015         .250

   Max.eff.Inten.(mm/hr)=  160.97        78.42
         over (min)=         2.00         8.00
   Storage Coeff.  (min)=   1.59 (ii)    7.62 (ii)
   Unit Hyd. Tpeak (min)=   2.00         8.00
   Unit Hyd. peak  (cms)=    .64          .15
                                                  *TOTALS*
   PEAK FLOW      (cms)=      .11          .03       .132 (iii)
   TIME TO PEAK   (hrs)=     1.50         1.58      1.500
   RUNOFF VOLUME  (mm)=     86.08        41.15     65.413
   TOTAL RAINFALL (mm)=     87.08        87.08     87.083
   RUNOFF COEFFICIENT  =      .99          .47       .751

     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* =  75.0   Ia = Dep. Storage  (Above)
    (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
         THAN THE STORAGE COEFFICIENT.
   (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
100:0004----------------------------------------------------------------------
*#***********************************************************************|
*#***********************************************************************|
*#***********************************************************************|
*#        POST-DEVELOPMENT CONDITIONS HYDROLOGIC MODELING
*#        ================================================
*#***********************************************************************|
*
*# CATCHMENT 201 - PROPOSED BUIDLING ROOF AND RAMP
*
---------------------
```

```
---------------------
| CALIB STANDHYD    |   Area    (ha)=    .23
| 01:301   DT= 1.00 |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
---------------------
                       IMPERVIOUS   PERVIOUS (i)
   Surface Area   (ha)=     .23          .00
   Dep. Storage   (mm)=    1.00         4.00
   Average Slope   (%)=    1.00         2.00
   Length          (m)=   10.00          .10
   Mannings n       =      .015         .250

   Max.eff.Inten.(mm/hr)=  160.97        90.65
         over (min)=         1.00         1.00
   Storage Coeff.  (min)=    .58 (ii)     .78 (ii)
   Unit Hyd. Tpeak (min)=   1.00         1.00
   Unit Hyd. peak  (cms)=   1.40         1.23
                                                  *TOTALS*
   PEAK FLOW      (cms)=      .10          .00       .102 (iii)
   TIME TO PEAK   (hrs)=     1.48         1.50      1.500
   RUNOFF VOLUME  (mm)=     86.08        41.15     85.633
   TOTAL RAINFALL (mm)=     87.08        87.08     87.083
   RUNOFF COEFFICIENT  =      .99          .47       .983

     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* =  75.0   Ia = Dep. Storage  (Above)
    (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
         THAN THE STORAGE COEFFICIENT.
   (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
100:0005----------------------------------------------------------------------
*#***********************************************************************|
*# CATCHMENT 202 - PARKING, DRIVEWAY SURFACE AND LANDSCAPING
*
---------------------
| CALIB STANDHYD    |   Area    (ha)=    .12
| 02:202   DT= 1.00 |   Total Imp(%)=  93.00   Dir. Conn.(%)=  93.00
---------------------
                       IMPERVIOUS   PERVIOUS (i)
   Surface Area   (ha)=     .11          .01
   Dep. Storage   (mm)=    1.00         4.00
   Average Slope   (%)=    2.00         2.00
   Length          (m)=   15.00        20.00
   Mannings n       =      .015         .250

   Max.eff.Inten.(mm/hr)=  160.97        82.33
         over (min)=         1.00         6.00
   Storage Coeff.  (min)=    .60 (ii)    5.63 (ii)
   Unit Hyd. Tpeak (min)=   1.00         6.00
   Unit Hyd. peak  (cms)=   1.38          .20
                                                  *TOTALS*
   PEAK FLOW      (cms)=      .05          .00       .051 (iii)
   TIME TO PEAK   (hrs)=     1.48         1.55      1.500
   RUNOFF VOLUME  (mm)=     86.08        41.15     82.937
   TOTAL RAINFALL (mm)=     87.08        87.08     87.083
   RUNOFF COEFFICIENT  =      .99          .47       .952

     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* =  75.0   Ia = Dep. Storage  (Above)
    (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
         THAN THE STORAGE COEFFICIENT.
   (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-------------------------------------------------------------------------------
100:0006----------------------------------------------------------------------
*#***********************************************************************|
*# CATCHMENT 203 - LANDSCAPING AT NORTH AND NORTHEAST
*
---------------------
| CALIB NASHYD      |   Area    (ha)=    .06   Curve Number   (CN)=75.00
| 03:203   DT= 1.00 |   Ia    =   4.000   # of Linear Res.(N)= 3.00
---------------------   U.H. Tp(hrs)=    .170

   Unit Hyd Qpeak (cms)=    .013

   PEAK FLOW      (cms)=    .007 (i)
   TIME TO PEAK   (hrs)=   1.633
   RUNOFF VOLUME  (mm)=   41.144
   TOTAL RAINFALL (mm)=   87.083
   RUNOFF COEFFICIENT  =    .472

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

-------------------------------------------------------------------------------
100:0007----------------------------------------------------------------------
*# TOTAL FLOW FROM ROOF AND SURFACE ROUTED THROUGH SWM STORAGE - 201+202+203
---------------------
| ADD HYD (T-SWM  ) | ID: NHYD    AREA   QPEAK   TPEAK    R.V.    DWF
---------------------             (ha)   (cms)   (hrs)   (mm)    (cms)
                        ID1 01:301   .23    .102    1.50   85.63    .000
                       +ID2 02:202   .12    .051    1.50   82.94    .000
                       +ID3 03:203   .06    .007    1.63   41.14    .000
                        =============================================
                        SUM 07:T-SWM  .41    .158    1.50   78.33    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-------------------------------------------------------------------------------
100:0008----------------------------------------------------------------------
* ROUTE THROUGH BASEMENT STORAGE TANK C/W 140 MMM ORIIFICE CONTROL
---------------------
| ROUTE RESERVOIR   |   Requested routing time step =  1.0 min.
| IN>07:(T-SWM )     |
| OUT<08:(TANK  )    |   =========  OUTFLOW STORAGE TABLE  =========
---------------------   OUTFLOW    STORAGE    | OUTFLOW    STORAGE
                        (cms)     (ha.m.)     | (cms)     (ha.m.)
                         .000   .0000E+00       .031   .8100E-02
                         .007   .1000E-03       .034   .9400E-02
                         .017   .1700E-02       .036   .1070E-01
                         .022   .3900E-02       .038   .1170E-01
                         .025   .5000E-02       .041   .1260E-01
                         .028   .6600E-02       .043   .1330E-01

   ROUTING RESULTS          AREA   QPEAK   TPEAK     R.V.
   ---------------------     (ha)   (cms)   (hrs)    (mm)
   INFLOW >07: (T-SWM )       .41    .158   1.500   78.334
```

```
   OUTFLOW<08: (TANK )         .41     .037    1.683    78.333
   OVERFLOW<09: (OF-TNK)       .00     .000     .000      .000

               TOTAL NUMBER OF SIMULATED OVERFLOWS  =         0
               CUMULATIVE TIME OF OVERFLOWS  (hours)=       .00
               PERCENTAGE OF TIME OVERFLOWING    (%)=       .00


               PEAK   FLOW   REDUCTION [Qout/Qin](%)=    23.559
               TIME SHIFT OF PEAK FLOW       (min)=     11.00
               MAXIMUM  STORAGE   USED     (ha.m.)=.1123E-01
```

```
*                                                         *
     FINISH
---------------------------------------------------------
*********************************************************
     WARNINGS / ERRORS / NOTES
     -------------------------
   Simulation ended on 2023-07-25    at 19:28:09
=========================================================
```

```
-----------------------------------------------------------------------------
100:0009-----------------------------------------------------------------------
*#******************************************************************************|

---------------------
| COMPUTE VOLUME    |
| ID:07  (T-SWM )   |              DISCHARGE    TIME
---------------------                (cms)      (hrs)
               START CONTROLLING AT    .016     1.001
               INFLOW HYD. PEAKS AT    .158     1.500
               STOP  CONTROLLING AT    .040     1.681

               REQUIRED STORAGE VOLUME (ha.m.)=    .0093
               TOTAL HYDROGRAPH VOLUME (ha.m.)=    .0321
               % OF HYDROGRAPH TO STORE     =  29.0569


           NOTE:  Storage was computed to reduce the Inflow
                  peak to    .040  (cms).


-----------------------------------------------------------------------------
100:0010-----------------------------------------------------------------------
*
*# CATCHMENT 204 - UNCONTROLLED FRONT AREA
*
-----------------------
| CALIB STANDHYD    |    Area    (ha)=    .04
| 04:204   DT= 1.00 |    Total Imp(%)=  58.00  Dir. Conn.(%)=  58.00
-----------------------
                        IMPERVIOUS   PERVIOUS (i)
   Surface Area   (ha)=      .02         .02
   Dep. Storage   (mm)=     1.00        4.00
   Average Slope   (%)=     2.00        2.00
   Length          (m)=     2.00        2.00
   Mannings n       =      .015        .250

   Max.eff.Inten.(mm/hr)=  160.97       90.65
            over (min)=     1.00        1.00
   Storage Coeff.  (min)=    .18 (ii)   1.40 (ii)
   Unit Hyd. Tpeak (min)=    1.00       1.00
   Unit Hyd. peak  (cms)=    1.69        .87
                                                  *TOTALS*
   PEAK FLOW     (cms)=      .01         .00         .014 (iii)
   TIME TO PEAK  (hrs)=     1.38        1.50        1.500
   RUNOFF VOLUME  (mm)=    86.08       41.15       67.210
   TOTAL RAINFALL (mm)=    87.08       87.08       87.083
   RUNOFF COEFFICIENT =      .99         .47         .772

     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN* =  75.0    Ia = Dep. Storage  (Above)
    (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
   (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-----------------------------------------------------------------------------
100:0011-----------------------------------------------------------------------
*#******************************************************************************|
*# TOTAL SITE DISCHARGE - CONTORLLED + UNCONTROLLED
-----------------------
| ADD HYD (T-CONT  ) | ID: NHYD      AREA    QPEAK   TPEAK    R.V.    DWF
-----------------------                (ha)    (cms)   (hrs)    (mm)   (cms)
                     ID1 08:TANK        .41     .037    1.68   78.33    .000
                    +ID2 09:OF-TNK      .00     .000     .00     .00    .000
                    +ID3 04:204         .04     .014    1.50   67.21    .000
                                   ===================================
                     SUM 10:T-CONT      .45     .049    1.50   77.34    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-----------------------------------------------------------------------------
100:0012-----------------------------------------------------------------------
*
*# TOTAL UNCONTROLLED FLOW FROM SITE
-----------------------
| ADD HYD (UNCON   ) | ID: NHYD      AREA    QPEAK   TPEAK    R.V.    DWF
-----------------------                (ha)    (cms)   (hrs)    (mm)   (cms)
                     ID1 07:T-SWM       .41     .158    1.50   78.33    .000
                    +ID2 04:204         .04     .014    1.50   67.21    .000
                                   ===================================
                     SUM 10:UNCON       .45     .173    1.50   77.34    .000

   NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-----------------------------------------------------------------------------
100:0013-----------------------------------------------------------------------
*
* RUN REMAINING DESIGN STORMS (HAMILTON MOUNT HOPE 5 TO 100-YR)
*
-----------------------------------------------------------------------------
100:0002-----------------------------------------------------------------------
*
-----------------------------------------------------------------------------
100:0002-----------------------------------------------------------------------
*
-----------------------------------------------------------------------------
100:0002-----------------------------------------------------------------------
*
-----------------------------------------------------------------------------
100:0002-----------------------------------------------------------------------
*
-----------------------------------------------------------------------------
100:0002-----------------------------------------------------------------------
*
* START           TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[125]
*                 MTHP25MM.STM
```

APPENDIX F

SWM Quantity and Quality Control Calculations

WALTERFEDY

STAGE-STORAGE-DISCHARGE CALCULATIONS FOR PROPOSED SWM TANKS

Outlet Device No. 1 (Quantity)		Outlet Device No. 2 (Quantity)		Outlet Device No. 3		Outlet No. 4 (Quantity)	
Type:	Circular Orifice	Type:	N/A	Type:	N/A	Type:	N/A
Diameter (mm)	140	Diameter (mm)	0	Diameter (mm)	0	Sill Elevation (m)	0.00
Area (m^2)	0.01539	Area (m^2)	0.00000	Area (m^2)	0.00000	Length (m)	0.0
Invert Elev. (m)	209.75	Invert Elev. (m)	0.00	Invert Elev. (m)	0.00	Discharge (Q) =	1.67 L H$^{1.5}$
C/L Elev. (m)	209.82	C/L Elev. (m)	0.00	C/L Elev. (m)	0.00		
Disch. Coeff. (C_d)	0.6	Disch. Coeff. (C_d)	0.6	Disch. Coeff. (C_d)	0		
Discharge (Q) =	$C_d A (2 g H)^{0.5}$	Discharge (Q) = $C_d A (2 g H)^{0.5}$		Discharge (Q) =	0		
Number of Orifices:	1	Number of Orifices:	0	Number of Orifices:	0		
		Spill into structure at elev. (m)	0.00				
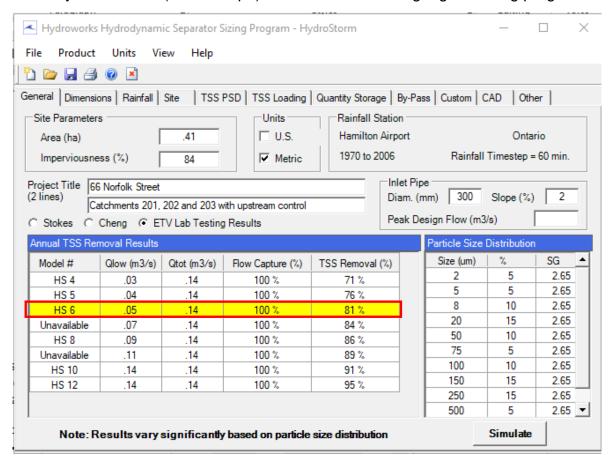
		SWM Pond Volumes				Outlet No. 1		Outlet No. 2		Outlet No. 3		Outlet No. 4		
	Elevation	Area	Incremental Volume	Cumulative Volume	Active Storage Volume	H	Discharge	H	Discharge	H	Discharge	H	Discharge	Total Discharge
	m	m^2	m^3	m^3	m^3	m	m^3/s	m	m^3/s	m	m^3/s	m	m^3/s	m^3/s
Orifice Invert	209.75			0	0	0.000	0.0000							0.0000
Bottom of Stone	209.85			1	1	0.030	0.0071							0.0071
Bottom of Tanks	210.00			17	17	0.180	0.0174							0.0174
	210.10			39	39	0.280	0.0216							0.0216
	210.20			50	50	0.380	0.0252							0.0252
StormTech SC-740	210.30			66	66	0.480	0.0283							0.0283
Storage Tanks	210.40			81	81	0.580	0.0312							0.0312
	210.50			94	94	0.680	0.0337							0.0337
	210.60			107	107	0.780	0.0361							0.0361
	210.70			117	117	0.880	0.0384							0.0384
	210.80			126	126	0.980	0.0405							0.0405
Top of Stone	210.90			133	133	1.080	0.0425							0.0425

Water Quality

Oil/Grit Separator

Conservatively sized for Catchments 201, 202 and 203 which includes clean water runoff from roof and landscaping.

- Upstream SWM controls
- ETV Particle Size
- City of Hamilton (Mount Hope) rainfall - closest rain gauge in sizing program

Hydroworks Hydrodynamic Separator Sizing Program - HydroStorm

File   Product   Units   View   Help

General | Dimensions | Rainfall | Site | TSS PSD | TSS Loading | Quantity Storage | By-Pass | Custom | CAD | Other

Site Parameters

Area (ha): .41

Imperviousness (%): 84

Units

☐ U.S.

☑ Metric

Rainfall Station

Hamilton Airport   Ontario

1970 to 2006   Rainfall Timestep = 60 min.

Project Title (2 lines): 66 Norfolk Street

Catchments 201, 202 and 203 with upstream control

○ Stokes   ○ Cheng   ● ETV Lab Testing Results

Inlet Pipe

Diam. (mm): 300   Slope (%): 2

Peak Design Flow (m3/s):

Annual TSS Removal Results

Model #	Qlow (m3/s)	Qtot (m3/s)	Flow Capture (%)	TSS Removal (%)
HS 4	.03	.14	100 %	71 %
HS 5	.04	.14	100 %	76 %
HS 6	.05	.14	100 %	81 %
Unavailable	.07	.14	100 %	84 %
HS 8	.09	.14	100 %	86 %
Unavailable	.11	.14	100 %	89 %
HS 10	.14	.14	100 %	91 %
HS 12	.14	.14	100 %	95 %

Particle Size Distribution

Size (um)	%	SG
2	5	2.65
5	5	2.65
8	10	2.65
20	15	2.65
50	10	2.65
75	5	2.65
100	10	2.65
150	15	2.65
250	15	2.65
500	5	2.65

Note: Results vary significantly based on particle size distribution

Simulate

APPENDIX G

O&M Manuals for SWM Infrastructure

Isolator® Row Plus
O&M Manual

The Isolator® Row Plus

Introduction

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The StormTech Isolator Row Plus is a technique to inexpensively enhance Total Suspended Solids (TSS) and Total Phosphorus (TP) removal with easy access for inspection and maintenance.

The Isolator Row Plus

The Isolator Row Plus is a row of StormTech chambers, either SC-160, SC-310, SC-310-3, SC-740, DC-780, MC-3500 or MC-7200 models, that is surrounded with filter fabric and connected to a closely located manhole for easy access. The fabric-wrapped chambers provide for sediment settling and filtration as stormwater rises in the Isolator Row Plus and passes through the filter fabric. The open bottom chambers and perforated sidewalls (SC-310, SC- 310-3 and SC-740 models) allow stormwater to flow both vertically and horizontally out of the chambers. Sediments are captured in the Isolator Row Plus protecting the adjacent stone and chambers storage areas from sediment accumulation.

ADS geotextile fabric is placed between the stone and the Isolator Row Plus chambers. The woven geotextile provides a media for stormwater filtration, a durable surface for maintenance, prevents scour of the underlying stone and remains intact during high pressure jetting. A non-woven fabric is placed over the chambers to provide a filter media for flows passing through the chamber's sidewall. The non-woven fabric is not required over the SC-160, DC-780, MC-3500 or MC-7200 models as these chambers do not have perforated side walls.

The Isolator Row Plus is designed to capture the "first flush" runoff and offers the versatility to be sized on a volume basis or a flow-rate basis. An upstream manhole provides access to the Isolator Row Plus and includes a high/low concept such that stormwater flow rates or volumes that exceed the capacity of the Isolator Row Plus bypass through a manifold to the other chambers. This is achieved with an elevated bypass manifold or a high-flow weir. This creates a differential between the Isolator Row Plus row of chambers and the manifold to the rest of the system, thus allowing for settlement time in the Isolator Row Plus. After Stormwater flows through the Isolator Row Plus and into the rest of the chamber system it is either exfiltrated into the soils below or passed at a controlled rate through an outlet manifold and outlet control structure.

The Isolator Row FLAMP™ (patent pending) is a flared end ramp apparatus attached to the inlet pipe on the inside of the chamber end cap. The FLAMP provides a smooth transition from pipe invert to fabric bottom. It is configured to improve chamber function performance by enhancing outflow of solid debris that would otherwise collect at the chamber's end. It also serves to improve the fluid and solid flow into the access pipe during maintenance and cleaning and to guide cleaning and inspection equipment back into the inlet pipe when complete.

The Isolator Row Plus may be part of a treatment train system. The treatment train design and pretreatment device selection by the design engineer is often driven by regulatory requirements. Whether pretreatment is used or not, StormTech recommend using the Isolator Row Plus to minimize maintenance requirements and maintenance costs.
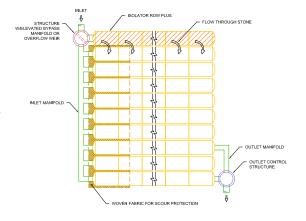
Note: See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row Plus.

Looking down the Isolator Row PLUS from the manhole opening, ADS PLUS Fabric is shown between the chamber and stone base.

StormTech Isolator Row PLUS with Overflow Spillway (not to scale)

Isolator Row Plus Inspection/Maintenance

Inspection

The frequency of inspection and maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row Plus should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

The Isolator Row Plus incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3 inches throughout the length of the Isolator Row Plus, clean-out should be performed.

Maintenance

The Isolator Row Plus was designed to reduce the cost of periodic maintenance. By "isolating" sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entries.

Maintenance is accomplished with the JetVac process. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row Plus while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45" are best. StormTech recommends a maximum nozzle pressure of 2000 psi be utilized during cleaning. JetVac reels can vary in length. For ease of maintenance, ADS recommends Isolator Row Plus lengths up to 200' (61 m). **The JetVac process shall only be performed on StormTech Isolator Row Plus that have ADS Plus Fabric (as specified by StormTech) over their angular base stone.**
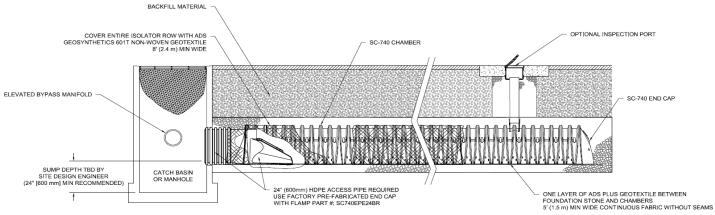
StormTech Isolator Row PLUS (*not to scale*)

Note: *Non-woven fabric is only required over the inlet pipe connection into the end cap for SC-160LP, DC-780, MC-3500 and MC-7200 chamber models and is not required over the entire Isolator Row PLUS.*

BACKFILL MATERIAL

COVER ENTIRE ISOLATOR ROW WITH ADS GEOSYNTHETICS 601T NON-WOVEN GEOTEXTILE 8' (2.4 m) MIN WIDE

SC-740 CHAMBER

OPTIONAL INSPECTION PORT

ELEVATED BYPASS MANIFOLD

SC-740 END CAP

SUMP DEPTH TBD BY SITE DESIGN ENGINEER (24" [600 mm] MIN RECOMMENDED)

CATCH BASIN OR MANHOLE

24" (600mm) HDPE ACCESS PIPE REQUIRED USE FACTORY PRE-FABRICATED END CAP WITH FLAMP PART #: SC740EPE24BR

ONE LAYER OF ADS PLUS GEOTEXTILE BETWEEN FOUNDATION STONE AND CHAMBERS 5' (1.5 m) MIN WIDE CONTINUOUS FABRIC WITHOUT SEAMS

Isolator Row Plus Step By Step Maintenance Procedures

Step 1

Inspect Isolator Row Plus for sediment.
  A) Inspection ports (if present)
       i. Remove lid from floor box frame
      ii. Remove cap from inspection riser
     iii. Using a flashlight and stadia rod,measure depth of sediment and record results on maintenance log.
      iv. If sediment is at or above 3 inch depth, proceed to Step 2. If not, proceed to Step 3.
  B) All Isolator Row Plus
       i. Remove cover from manhole at upstream end of Isolator Row Plus
      ii. Using a flashlight, inspect down Isolator Row Plus through outlet pipe
          1. Mirrors on poles or cameras may be used to avoid a confined space entry
          2. Follow OSHA regulations for confined space entry if entering manhole
     iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches), proceed to Step 2.
          If not, proceed to Step 3.

Step 2

Clean out Isolator Row Plus using the JetVac process.
  A) A fixed floor cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable
  B) Apply multiple passes of JetVac until backflush water is clean
  C) Vacuum manhole sump as required
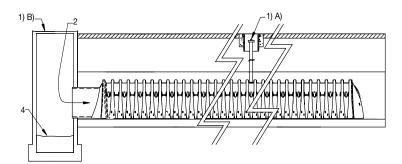
Step 3
Replace all caps, lids and covers, record observations and actions.

Step 4
Inspect & clean catch basins and manholes upstream of the StormTech system.

Sample Maintenance Log

Date	Stadia Rod Readings		Sedi-ment Depth (1)–(2)	Observations/Actions	Inspector
	Fixed point to chamber bottom (1)	Fixed point to top of sediment (2)			
3/15/11	6.3 ft	none		New installation, Fixed point is CI frame at grade	DJM
9/24/11		6.2	0.1 ft	Some grit felt	SM
6/20/13		5.8	0.5 ft	Mucky feel, debris visible in manhole and in Isolator Row PLUS, maintenance due	NV
7/7/13	6.3 ft		0	System jetted and vacuumed	DJM

adspipe.com
800-821-6710

//ADS
StormTech

Hydroworks® HydroStorm

Operations & Maintenance Manual

Version 1.0

Introduction

The HydroStorm is a state of the art hydrodynamic separator. Hydrodynamic separators remove solids, debris and lighter than water (oil, trash, floating debris) pollutants from stormwater. Hydrodynamic separators and other water quality measures are mandated by regulatory agencies (Town/City, State, Federal Government) to protect storm water quality from pollution generated by urban development (traffic, people) as part of new development permitting requirements.

As storm water treatment structures fill up with pollutants they become less and less effective in removing new pollution. Therefore, it is important that storm water treatment structures be maintained on a regular basis to ensure that they are operating at optimum performance. The HydroStorm is no different in this regard and this manual has been assembled to provide the owner/operator with the necessary information to inspect and coordinate maintenance of their HydroStorm.

Hydroworks® HydroStorm Operation

The Hydroworks HydroStorm (HS) separator is a unique hydrodynamic by-pass separator. It incorporates a protected submerged pretreatment zone to collect larger solids, a treatment tank to remove finer solids, and a dual set of weirs to create a high flow bypass. High flows are conveyed directly to the outlet and do not enter the treatment area, however, the submerged pretreatment area still allows removal of coarse solids during high flows.

Under normal or low flows, water enters an inlet area with a horizontal grate. The area underneath the grate is submerged with openings to the main treatment area of the separator. Coarse solids fall through the grate and are either trapped in the pretreatment area or conveyed into the main treatment area depending on the flow rate. Fines are transported into the main treatment area. Openings and weirs in the pretreatment area allow entry of water and solids into the main treatment area and cause water to rotate in the main treatment area creating a vortex motion. Water in the main treatment area is forced to rise along the walls of the separator to discharge from the treatment area to the downstream pipe.

The vortex motion forces solids and floatables to the middle of the inner chamber. Floatables are trapped since the inlet to the treatment area is submerged. The design maximizes the retention of settled solids since solids are forced to the center of the inner chamber by the vortex motion of water while water must flow up the walls of the separator to discharge into the downstream pipe.

A set of high flow weirs near the outlet pipe create a high flow bypass over both the pretreatment area and main treatment chamber. The rate of flow into the treatment area is regulated by the number and size of openings into the treatment chamber and the height of by-pass weirs. High flows flow over the weirs directly to the outlet pipe preventing the scour and resuspension of any fines collected in the treatment chamber.

A central access tube is located in the structure to provide access for cleaning. The arrangement of the inlet area and bypass weirs near the outlet pipe facilitate the use of multiple inlet pipes.
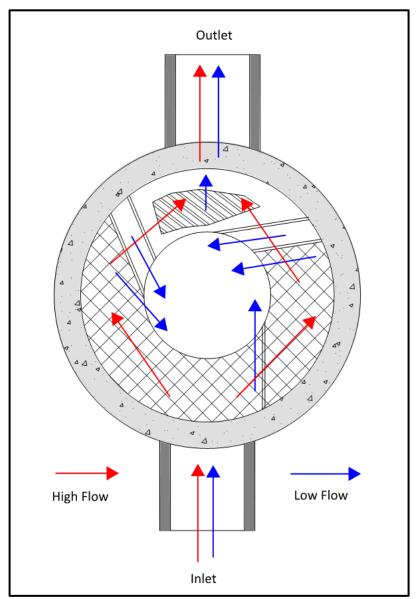
Figure 1. Hydroworks HydroStorm Operation – Plan View

Figure 2 is a profile view of the HydroStorm separator showing the flow patterns for low and high flows.
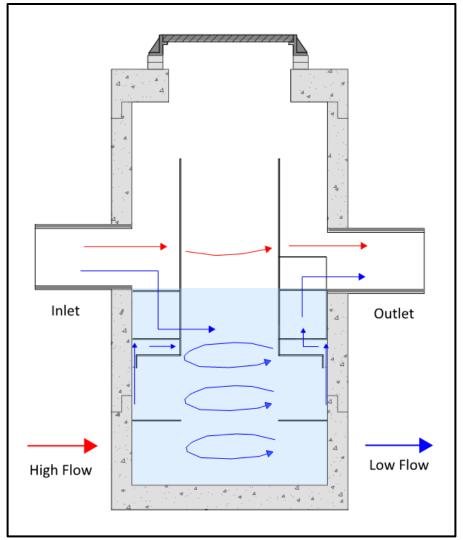
Figure 2. Hydroworks HydroStorm Operation – Profile View

The HS 4i is an inlet version of the HS 4 separator. There is a catch-basin grate on top of the HS 4i. A funnel sits sits underneath the grate on the frame and directs the water to the inlet side of the separator to ensure all lows flows are properly treated. The whole funnel is removed for inspection and cleaning.
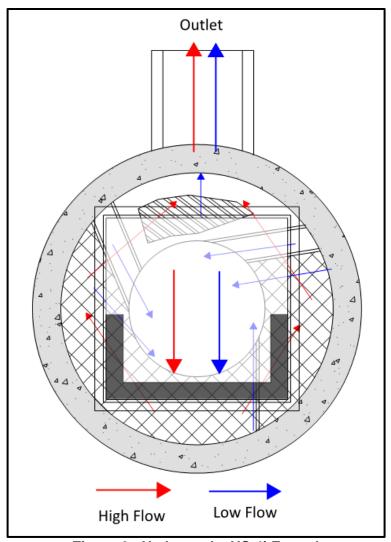
Figure 3. Hydroworks HS 4i Funnel

<u>**Inspection**</u>

Procedure

<u>Floatables</u>

A visual inspection can be conducted for floatables by removing the covers and looking down into the center access tube of the separator. Separators with an inlet grate (HS 4i or custom separator) will have a plastic funnel located under the grate that must be removed from the frame prior to inspection or maintenance. If you are missing a funnel please contact Hydroworks at the numbers provided at the end of this document.

TSS/Sediment

Inspection for TSS build-up can be conducted using a Sludge Judge®, Core Pro®, AccuSludge® or equivalent sampling device that allows the measurement of the depth of TSS/sediment in the unit. These devices typically have a ball valve at the bottom of the tube that allows water and TSS to flow into the tube when lowering the tube into the unit. Once the unit touches the bottom of the device, it is quickly pulled upward such that the water and TSS in the tube forces the ball valve closed allowing the user to see a full core of water/TSS in the unit. The unit should be inspected for TSS through each of the access covers. Several readings (2 or 3) should be made at each access cover to ensure that an accurate TSS depth measurement is recorded.

Frequency

Construction Period

The HydroStorm separator should be inspected every four weeks and after every large storm (over 0.5" (12.5 mm) of rain) during the construction period.

Post-Construction Period

The Hydroworks HydroStorm separator should be inspected during the first year of operation for normal stabilized sites (grassed or paved areas). If the unit is subject to oil spills or runoff from unstabilized (storage piles, exposed soils) areas the HydroStorm separator should be inspected more frequently (4 times per year). The initial annual inspection will indicate the required future frequency of inspection and maintenance if the unit was maintained after the construction period.

Reporting

Reports should be prepared as part of each inspection and include the following information:

1. Date of inspection
2. GPS coordinates of Hydroworks unit
3. Time since last rainfall
4. Date of last inspection
5. Installation deficiencies (missing parts, incorrect installation of parts)
6. Structural deficiencies (concrete cracks, broken parts)
7. Operational deficiencies (leaks, blockages)
8. Presence of oil sheen or depth of oil layer
9. Estimate of depth/volume of floatables (trash, leaves) captured
10. Sediment depth measured
11. Recommendations for any repairs and/or maintenance for the unit
12. Estimation of time before maintenance is required if not required at time of inspection

Hydroworks

A sample inspection checklist is provided at the end of this manual.

Maintenance

Procedure

The Hydroworks HydroStorm unit is typically maintained using a vacuum truck. There are numerous companies that can maintain the HydroStorm separator. Maintenance with a vacuum truck involves removing all of the water and sediment together. The water is then separated from the sediment on the truck or at the disposal facility.

A central access opening (24" or greater) is provided to the gain access to the lower treatment tank of the unit. This is the primary location to maintain by vacuum truck. The pretreatment area can also be vacuumed and/or flushed into the lower treatment tank of the separator for cleaning via the central access once the water level is lowered below the pretreatment floor.
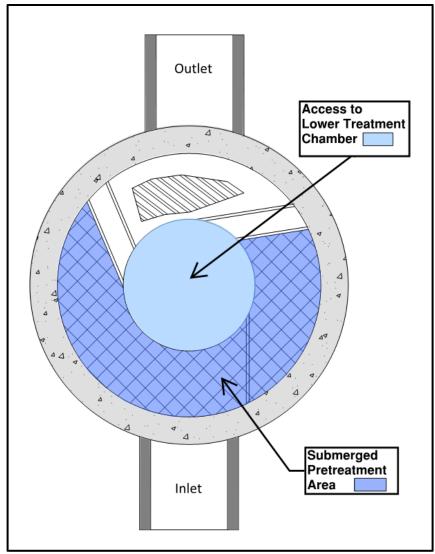
In instances where a vacuum truck is not available other maintenance methods (i.e. clamshell bucket) can be used, but they will be less effective. If a clamshell bucket is used the water must be decanted prior to cleaning since the sediment is under water and typically fine in nature. Disposal of the water will depend on local requirements. Disposal options for the decanted water may include:

1. Discharge into a nearby sanitary sewer manhole
2. Discharge into a nearby LID practice (grassed swale, bioretention)
3. Discharge through a filter bag into a downstream storm drain connection

The local municipality should be consulted for the allowable disposal options for both water and sediments prior to any maintenance operation. Once the water is decanted the sediment can be removed with the clamshell bucket.

Disposal of the contents of the separator depend on local requirements. Maintenance of a Hydroworks HydroStorm unit will typically take 1 to 2 hours based on a vacuum truck and longer for other cleaning methods (i.e. clamshell bucket).

Hydroworks

Figure 3. Maintenance Access

Frequency

<u>Construction Period</u>

A HydroStorm separator can fill with construction sediment quickly during the construction period. The HydroStorm must be maintained during the construction period when the depth of TSS/sediment reaches 24" (600 mm). It must also be maintained during the construction period if there is an appreciable depth of oil in the unit (more than a sheen) or if floatables other than oil cover over 50% of the area of the separator

The HydroStorm separator should be maintained at the end of the construction period, prior to operation for the post-construction period.

Post-Construction Period

The HydroStorm was independently tested by Alden Research Laboratory in 2017. A HydroStorm HS 4 was tested for scour with a 50% sediment depth of 0.5 ft. Therefore, maintenance for sediment accumulation is required if the depth of sediment is 1 ft or greater in separators with standard water (sump) depths (Table 1).

There will be designs with increased sediment storage based on specifications or site-specific criteria. A measurement of the total water depth in the separator through the central access tube should be taken and compared to water depth given in Table 1. The standard water depth from Table 1 should be subtracted from the measured water depth and the resulting extra depth should be added to the 1 ft to determine the site-specific sediment maintenance depth for that separator.

For example, if the measured water depth in the HS-7 is 7 feet, then the sediment maintenance depth for that HS-7 is 2 ft (= 1 + 7 – 6) and the separator does not need to be cleaned for sediment accumulation until the measure sediment depth is 2 ft.

The HydroStorm separator must also be maintained if there is an appreciable depth of oil in the unit (more than a sheen) or if floatables other than oil cover over 50% of the water surface of the separator.

Table 1 Standard Dimensions for Hydroworks HydroStorm Models

Model	Diameter (ft)	Total Water Depth (ft)	Sediment Maintenance Depth for Table 1 Total Water Depth(ft)
HS-3	3	3	1
HS-4	4	4	1
HS-5	5	4	1
HS-6	6	4	1
HS-7	7	6	1
HS-8	8	7	1
HS-9	9	7.5	1
HS-10	10	8	1
HS-11	11	9	1
HS-12	12	9.5	1

Hydroworks

HYDROSTORM INSPECTION SHEET

Date
Date of Last Inspection

Site
City
State
Owner

GPS Coordinates

Date of last rainfall

Site Characteristics	Yes	No
Soil erosion evident	☐	☐
Exposed material storage on site	☐	☐
Large exposure to leaf litter (lots of trees)	☐	☐
High traffic (vehicle) area	☐	☐

HydroStorm	Yes	No
Obstructions in the inlet or outlet	☐ *	☐
Missing internal components	☐ **	☐
Improperly installed inlet or outlet pipes	☐ ***	☐
Internal component damage (cracked, broken, loose pieces)	☐ **	☐
Floating debris in the separator (oil, leaves, trash)	☐	☐
Large debris visible in the separator	☐ *	☐
Concrete cracks/deficiencies	☐ ***	☐
Exposed rebar	☐ **	☐
Water seepage (water level not at outlet pipe invert)	☐ ***	☐

Water level depth below outlet pipe invert _____ "

Routine Measurements

Floating debris depth	< 0.5" (13mm)	☐	>0.5" 13mm)	☐ *
Floating debris coverage	< 50% of surface area	☐	> 50% surface area	☐ *
Sludge depth	< 12" (300mm)	☐	> 12" (300mm)	☐ *

* Maintenance required
** Repairs required
*** Further investigation is required

Hydroworks

Other Comments: _____

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Hydroworks

Hydroworks® HydroStorm

One Year Limited Warranty

Hydroworks, LLC warrants, to the purchaser and subsequent owner(s) during the warranty period subject to the terms and conditions hereof, the Hydroworks HydroStorm to be free from defects in material and workmanship under normal use and service, when properly installed, used, inspected and maintained in accordance with Hydroworks written instructions, for the period of the warranty. The standard warranty period is 1 year.

The warranty period begins once the separator has been manufactured and is available for delivery. Any components determined to be defective, either by failure or by inspection, in material and workmanship will be repaired, replaced or remanufactured at Hydroworks' option provided, however, that by doing so Hydroworks, LLC will not be obligated to replace an entire insert or concrete section, or the complete unit. This warranty does not cover shipping charges, damages, labor, any costs incurred to obtain access to the unit, any costs to repair/replace any surface treatment/cover after repair/replacement, or other charges that may occur due to product failure, repair or replacement.
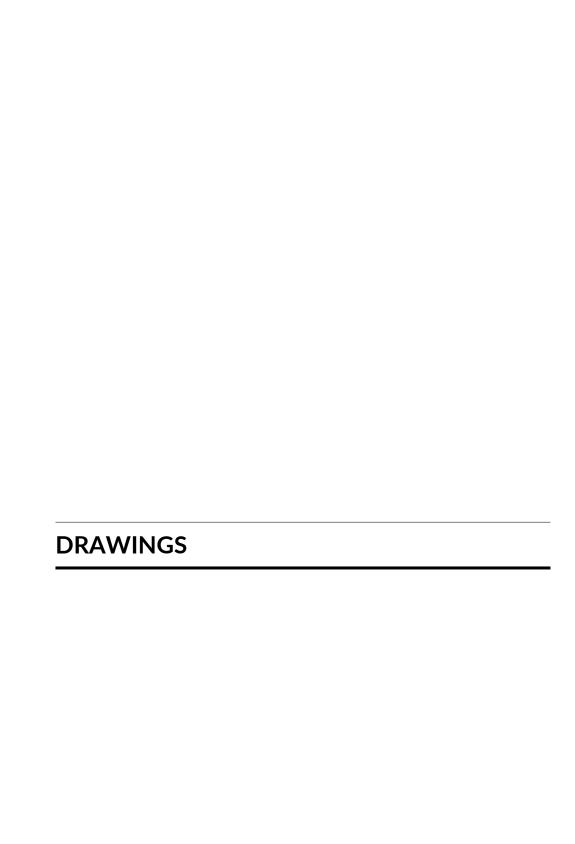
This warranty does not apply to any material that has been disassembled or modified without prior approval of Hydroworks, LLC, that has been subjected to misuse, misapplication, neglect, alteration, accident or act of God, or that has not been installed, inspected, operated or maintained in accordance with Hydroworks, LLC instructions and is in lieu of all other warranties expressed or implied. Hydroworks, LLC does not authorize any representative or other person to expand or otherwise modify this limited warranty.

The owner shall provide Hydroworks, LLC with written notice of any alleged defect in material or workmanship including a detailed description of the alleged defect upon discovery of the defect. Hydroworks, LLC should be contacted at 136 Central Ave., Clark, NJ 07066 or any other address as supplied by Hydroworks, LLC. (888-290-7900).

This limited warranty is exclusive. There are no other warranties, express or implied, or merchantability or fitness for a particular purpose and none shall be created whether under the uniform commercial code, custom or usage in the industry or the course of dealings between the parties. Hydroworks, LLC will replace any goods that are defective under this warranty as the sole and exclusive remedy for breach of this warranty.

Subject to the foregoing, all conditions, warranties, terms, undertakings or liabilities (including liability as to negligence), expressed or implied, and howsoever arising, as to the condition, suitability, fitness, safety, or title to the Hydroworks HydroStorm are hereby negated and excluded and Hydroworks, LLC gives and makes no such representation, warranty or undertaking except as expressly set forth herein. Under no circumstances shall Hydroworks, LLC be liable to the Purchaser or to any third party for product liability claims; claims arising from the design, shipment, or installation of the HydroStorm, or the cost of other goods or services related to the purchase and installation of the HydroStorm. For this Limited Warranty to apply, the HydroStorm must be installed in accordance with all site conditions required by state and local codes; all other applicable laws; and Hydroworks' written installation instructions.

Hydroworks, LLC expressly disclaims liability for special, consequential or incidental damages (even if it has been advised of the possibility of the same) or breach of expressed or implied warranty. Hydroworks, LLC shall not be liable for penalties or liquidated damages, including loss of production and profits; labor and materials; overhead costs; or other loss or expense incurred by the purchaser or any third party. Specifically excluded from limited warranty coverage are damages to the HydroStorm arising from ordinary wear and tear; alteration, accident, misuse, abuse or neglect; improper maintenance, failure of the product due to improper installation of the concrete sections or improper sizing; or any other event not caused by Hydroworks, LLC. This limited warranty represents Hydroworks' sole liability to the purchaser for claims related to the HydroStorm, whether the claim is based upon contract, tort, or other legal basis.

DRAWINGS

GENERAL NOTES

1. LEGAL BOUNDARY DATA OBTAINED FROM DRAWING No. 36991 - SURVEYORS REAL PROPERTY REPORT , PART 1, PLAN OF LOTS 7 & 14, BLOCK 103 AND ALL OF LOTS 8, 11 BLOCK 103, REGISTERED PLAN 182, PREPARED BY A.T. McLAREN, DATED JUNE 20, 2022.

2. EXISTING TOPOGRAPHICAL INFORMATION OBTAINED FROM SURVEY BY A.T. McLAREN DATED JUNE 20, 2022 AND APPENDED WITH ADDITIONAL SERVICING INFORMATION OBTAINED DRAWINGS RECEIVED FROM THE COUNTY OF NORFOLK.

3. THESE PLANS TO BE READ IN CONJUNCTION WITH THE FUNCTIONAL SERVICING AND SWM REPORT PREPARED BY WALTERFEDY, REF NO. 2022-0285-10 (LATEST REVISION).

4. THIS SET OF PLANS SHALL NOT BE USED FOR CONSTRUCTION UNTIL STAMPED BY THE DESIGN ENGINEER AND APPROVED BY THE COUNTY OF NORFOLK.

5. THIS PLAN TO BE USED FOR SERVICING AND GRADING ONLY ALL OTHER INFORMATION IS SHOWN FOR ILLUSTRATIVE PURPOSED ONLY. THIS PLAN MUST **NOT** BE USED TO SITE THE BUILDING .

6. NO CHANGES ARE TO BE MADE WITHOUT THE WRITTEN APPROVAL OF THE DESIGN ENGINEER.

7. THIS PLAN NOT TO BE REPRODUCED IN WHOLE OR IN PART WITHOUT THE PERMISSION OF WALTERFEDY.

8. THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS, AND OTHER UNDERGROUND AND ABOVEGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS AND, WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM THEMSELVES OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM AND THOSE NOT LOCATED PRIOR TO CONSTRUCTION.

9. IMMEDIATELY UPON AWARD OF THE CONTRACT (AND 72 HOURS PRIOR TO THE START OF CONSTRUCTION THE CONTRACTOR SHALL ARRANGE TO CHECK AND VERIFY ALL EXISTING CONDITIONS, LOCATIONS AND ELEVATIONS WHICH INCLUDES BUT IS NOT LIMITED TO THE BENCHMARK ELEVATIONS, EXISTING SERVICE CONNECTIONS AND EXISTING INVERTS. THIS SHALL INCLUDE HAVING THE LOCATION AND INVERT ELEVATIONS AT ALL CONNECTION POINTS FOR THE PROPOSED SERVICING TO THE EXISTING MUNICIPAL INFRASTRUCTURE CONFIRMED. ALL FINDING OF THIS PRE-CONSTRUCTION INVESTIGATION SHALL BE REPORTED TO THE DESIGN ENGINEER. IN WRITING THE OWNER SHALL NOT BE RESPONSIBLE FOR STAND BY CHARGES OR COSTS ASSOCIATED TO DELAYS RESULTING FROM A FAILURE BY THE CONTRACTOR TO PROVIDE THIS INFORMATION.

10. PRIOR TO CONSTRUCTION, THE CONTRACTOR MUST:
   10.1. OBTAIN ALL UTILITY LOCATES.
   10.2. OBTAIN ALL NECESSARY PERMITS, LICENSES AND CLEARANCES FROM THE REQUIRED APPROVAL/GOVERNING AUTHORITIES WITH COPIES PROVIDED TO THE CONSULTING ENGINEER.
   10.3. HOLD A PRE-CONSTRUCTION MEETING.
   10.4. VERIFY THAT THE FINISHED FLOOR ELEVATIONS AND BASEMENT ELEVATIONS WHICH MAY APPEAR ON THESE PLANS COMPLY WITH THE LATEST ARCHITECTURAL PLANS.
   10.5. VERIFY ALL DRAWINGS TO BE USED FOR CONSTRUCTION ARE OF THE MOST RECENT REVISION.

19. SHOP DRAWINGS SHALL BE PROVIDED AS REQUESTED FOR REVIEW FOR SPECIALTY AND MODIFIED ITEMS SUCH AS STORMWATER TANKS, OILGRIT SEPARATORS AND SPLITTER MANHOLES. SHOP DRAWING REVIEW SHALL NOT INCLUDE STANDARD OPSD ITEMS SUCH AS MANHOLES, CATCHBASINS, ETC.

20. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE CONSULTING ENGINEER 72 HOURS PRIOR TO COMMENCING THE SITE WORKS TO REQUEST INSPECTION. THE CONSULTING ENGINEER SHALL DETERMINE THE EXTENT OF INSPECTION AND TESTING REQUIRED FOR CERTIFICATION ON THE UNDERGROUND SERVICE INSTALLATION AS MANDATED BY THE ONTARIO BUILDING CODE DIVISION C, PART 1, SECTION 1.2.2, GENERAL REVIEW. FAILURE TO MAKE SUITABLE ARRANGEMENTS FOR INSPECTION WILL LEAD TO POST CONSTRUCTION TESTING AND INSPECTION AS DETERMINED BY THE ENGINEER. ALL COSTS ASSOCIATED WITH ANY REQUIRED POST CONSTRUCTION TESTING AND INSPECTION SHALL BE BORNE BY THE CONTRACTOR, INCLUDING ANY DELAYS TO CONSTRUCTION, NECESSARY REWORK AND RESTORATION OF DISTURBED WORKS. FINAL CERTIFICATION OF THE WORKS WILL BE WITHELD UNTIL ALL POST CONSTRUCTION INSPECTION OF THE UN-INSPECTED WORKS IS COMPLETE TO THE SATISFACTION OF THE CONSULTING ENGINEER. FULL PAYMENT FOR UN-INSPECTED WORKS MAY BE WITHHELD UNTIL.

21. WHERE EXISTING SERVICES ARE TO BE REUSED, THE CONTRACTOR SHALL MAKE ARRANGEMENTS TO VERIFY THE CONDITION OF THE SERVICE(S) INCLUDING FIELD LOCATING, CONFIRMING THE INVERTS AND SLOPES OF THE EXISTING SERVICE(S) AND COMPLETE A CCTV INSPECTION FROM THE PROPERTY LINE TO THE MAIN. ALL FINDINGS, INCLUDING CCTV INSPECTION VIDEO AND REPORT, TO BE PROVIDED THE DESIGN ENGINEER FOR APPROVAL A MINIMUM OF 72 HOURS PRIOR TO THE START OF THE SERVICING INSTALLATION. THE OWNER SHALL NOT BE RESPONSIBLE FOR STAND BY CHARGES OR COSTS ASSOCIATED TO DELAYS RESULTING FROM A FAILURE BY THE CONTRACTOR TO PROVIDE THIS INFORMATION.

22. ANY AREA DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO ITS ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE CONSULTANT AND AUTHORITY HAVING JURISDICTION. THE CONTRACTOR IS RESPONSIBLE FOR RESTORING ALL DAMAGED AND/OR DISTURBED PROPERTY WITHIN THE MUNICIPAL RIGHT-OF-WAY TO MUNICIPAL STANDARDS.

23. ALL HEALTH AND SAFETY RELATED SIGNAGE MUST BE POSTED AT THE SITE AS REQUIRED BY APPLICABLE LAW AND BEST MANAGEMENT PRACTICES.

24. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC AND SAFETY MEASURES DURING THE CONSTRUCTION PERIOD , INCLUDING THE SUPPLY, INSTALLATION AND REMOVAL OF ALL NECESSARY SIGNALS, DELINEATORS, MARKERS AND BARRIERS. ALL SIGNS, ETC. SHALL CONFORM TO THE STANDARDS OF NORFOLK COUNTY AND THE MTO MANUAL OF UNIFORM TRAFFIC DEVICES.

25. AT THE END OF CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE THE CONSULTANT WITH A RED LINED SET OF AS-CONSTRUCTED DRAWINGS. THE DRAWINGS MUST REFLECT THE CONSTRUCTED STATE OF THE WORK. SUBMISSION OF UNALTERED DESIGN DRAWINGS AND CONTRACT CHANGES WILL NOT BE ACCEPTED.

26. UNLESS OTHERWISE SPECIFIED, ALL RETAINING WALLS SHALL BE DESIGNED BY OTHERS.

27. SERVICING CONTRACTOR TO TERMINATE ALL SERVICES 1.0m FROM THE FOUNDATION WALL.

28. CONTRACTOR TO MAINTAIN A "CONFINED TRENCH CONDITION" IN ALL SEWER AND SERVICE TRENCHES.

29. THE MAXIMUM GRASSED SLOPE TO BE 3:1 UNLESS NOTED OTHERWISE, SLOPES GREATER THAN 3:1 TO LANDSCAPED WITH LOW MAINTENANCE GROUND COVER.

30. UNLESS OTHERWISE SPECIFIED, FILTER FABRIC TO BE TERRAFIX 270R OR APPROVED EQUIVALENT.

RELOCATIONS, REMOVALS AND ABANDONMENT NOTES

1. CONTRACTOR TO COORDINATE THE RELOCATIONS OF UTILITIES WITH THE UTILITY OWNER AS REQUIRED.

2. ALL REMOVALS INCLUDE OFFSITE DISPOSAL OF WASTE AND DELETERIOUS MATERIALS AT AN APPROVED DISPOSAL SITE.

3. CONTRACTOR TO COORDINATE THE REMOVAL OF EXISTING UTILITIES WITH THE UTILITY OWNER AND THE ELECTRICAL CONSULTANT.

3. CONCRETE SIDEWALKS TO BE SAW CUT AND REMOVED BY THE FULL BAY.

4. CONCRETE CURB AND BOULEVARD TO BE SAW CUT AND REMOVED AS REQUIRED. WHERE REMOVAL LIMITS ARE WITHIN 2.0m OF AN EXISTING EXPANSION JOINT OR SAW CUT, THE REMOVAL LIMITS SHALL EXTEND TO THE EXPANSION JOINT OR SAW CUT.

EROSION CONTROL NOTES

1. ALL EROSION CONTROL FENCING AND TEMPORARY FILTRATION MUST BE INSTALLED BY THE CONTRACTOR AND INSPECTED BY THE CONSULTANT PRIOR TO COMMENCEMENT OF ANY AREA GRADING, EXCAVATING, OR DEMOLITION. CONTRACTOR TO NOTIFY CONSULTANT FOR INSPECTION.

2. ATTACH EROSION CONTROL FENCE TO EXISTING CHAINLINK FENCE WITHIN THE LIMITS OF THE SITE WHERE POSSIBLE.

3. EROSION CONTROL FENCING TO BE PLACED AROUND THE BASE OF ALL STOCKPILES. ALL STOCKPILES TO BE KEPT A MINIMUM OF 2.5m FROM PROPERTY LINES.

3. FILTER FABRIC TO BE TERRAFIX 270R OR APPROVED EQUIVALENT.

3. ALL DITCH INLET CATCHBASINS, CATCHBASINS AND CATCHBASIN MANHOLES TO HAVE TEMPORARY FILTRATION INSTALLED AND MAINTAINED AS PER THE DETAIL ON THIS SHEET 1-1.

4. NO ALTERNATE METHODS OF EROSION CONTROL PROTECTION SHALL BE PERMITTED UNLESS APPROVED BY CONSULTING ENGINEER AND THE COUNTY OF NORFOLK AND LONG POINT CONSERVATION AUTHORITY.

5. ALL EROSION CONTROL STRUCTURES TO REMAIN IN PLACE UNTIL ALL DISTURBED GROUND SURFACES HAVE BEEN RE-STABILIZED EITHER BY PAVING OR RESTORATION WITH VEGETATIVE GROUND COVER.

6. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING SEDIMENTS FROM THE PUBLIC ROADWAY AND SIDEWALKS AT THE END OF EACH WORK DAY OR AS DIRECTED BY THE CONSULTANT.
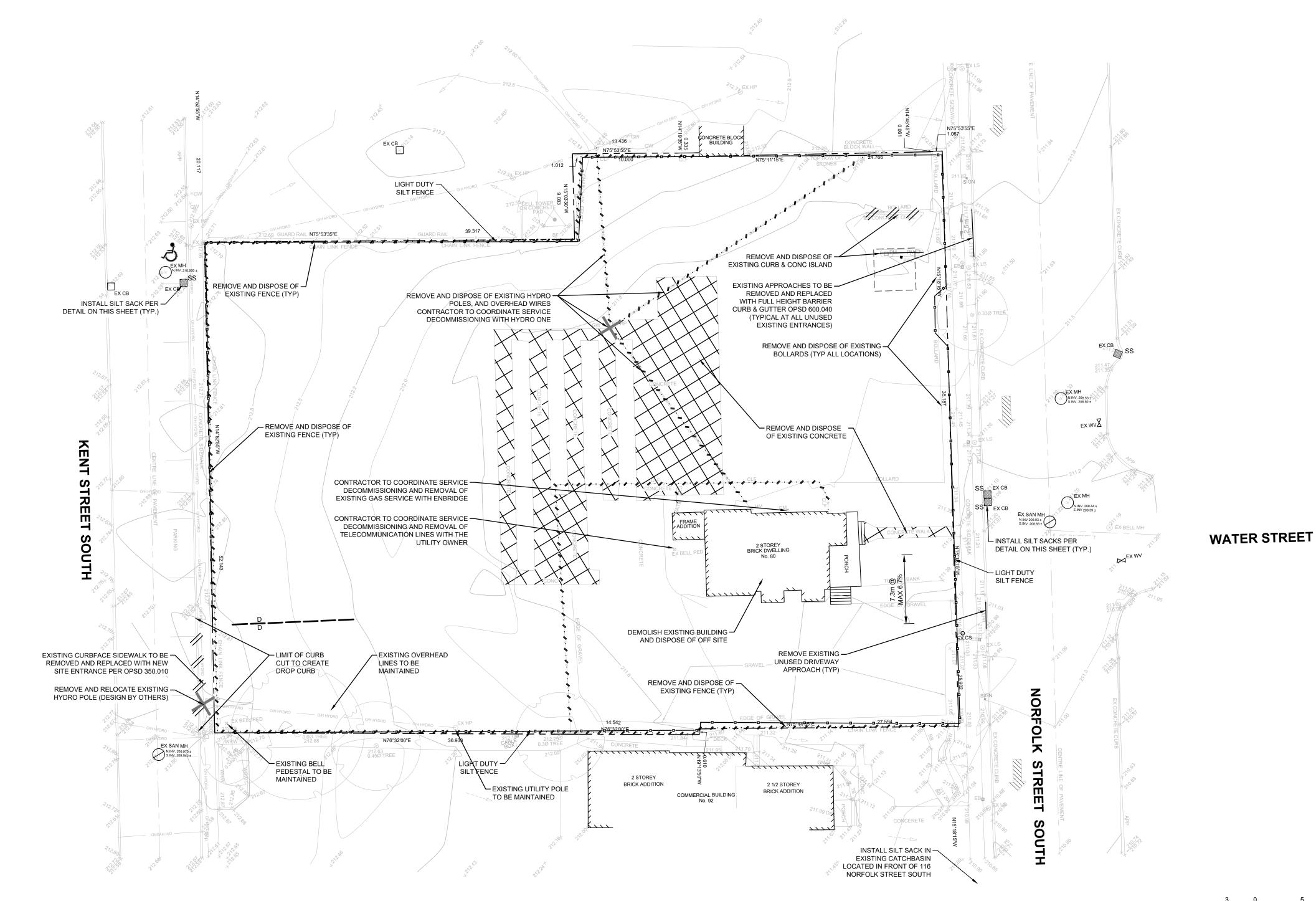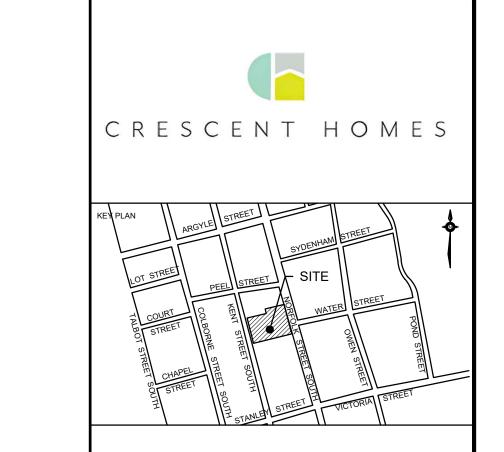
7. ALL EROSION AND SEDIMENT CONTROL MEASURES TO BE INSPECTED BY THE CONTRACTOR AFTER MAJOR RAINFALL EVENTS AND CLEANED OR REPLACED AS REQUIRED TO MEET THEIR INTENDED FUNCTION. SEDIMENTS TO BE REMOVED WHEN ACCUMULATIONS REACH A MAXIMUM OF ONE THIRD (1/3) THE STRUCTURE CAPACITY.

8. THE CONSULTING ENGINEER SHALL MONITOR SITE DEVELOPMENT TO ENSURE ALL EROSION CONTROLS ARE INSTALLED AND MAINTAINED TO THE COUNTY OF NORFOLK REQUIREMENTS. CONTRACTOR TO COMPLY WITH THE CONSULTING ENGINEER'S INSTRUCTIONS TO INSTALL, MODIFY, OR MAINTAIN EROSION CONTROL WORKS.

NOTE:
REFER TO SERVICING PLAN (SHEET C3-1) FOR UNDERGROUND SERVICING (SAN, STM AND WATER) REMOVAL INFORMATION.

SILTATION CONTROL FILTER FABRIC FENCE DETAIL
N.T.S.

50mm x 50mm WOOD POSTS c/w BEVELLED CORNERS @ 2.3m O.C.
TYPICAL JOINT
100mm
700mm
PROPYLENE REINFORCEMENT NETTING ON DOWNSTREAM SIDE OF FILTER FABRIC
(30m SECTIONS)
BACKFILL
500mm
150mm
FILTER FABRIC ENVIROFENCE OR APPROVED EQUAL
DIRECTION OF FLOW
NATIVE SOIL
FILTER FABRIC TUCKED UNDER BACKFILL

NOTE:
SILTATION CONTROL FILTER FABRIC FENCE TO BE "ENVIROFENCE" OR APPROVED EQUAL. FENCE TO BE INSTALLED BEFORE ANY EARTHWORK IS PERFORMED AND REMAIN UNTIL GROUND IS STABILIZED. ALL EARTH STOCKPILES TO HAVE SILTATION CONTROL FILTER FABRIC FENCE AROUND PERIMETER. CONTRACTOR TO MONITOR AND MAINTAIN FENCE AND IMMEDIATELY REPAIR ANY DAMAGE AFTER EVERY RAINFALL.

STREET CATCH BASIN SEDIMENT TRAP
N.T.S.

CATCHBASIN GRATE
PRECAST CB
SEDIMENT TRAP ('SILTSACK' OR APPROVED EQUIVALENT), TO BE HUNG FROM GRATE AS PER MANUFACTURER'S RECOMMENDATIONS
CB LEAD

Site Plan Annotations

EX CB
LIGHT DUTY SILT FENCE
CONCRETE BLOCK BUILDING
EX SAN MH
EX MH

INSTALL SILT SACK PER DETAIL ON THIS SHEET (TYP.)

REMOVE AND DISPOSE OF EXISTING FENCE (TYP)

REMOVE AND DISPOSE OF EXISTING HYDRO POLES, AND OVERHEAD WIRES CONTRACTOR TO COORDINATE SERVICE DECOMMISSIONING WITH HYDRO ONE

REMOVE AND DISPOSE OF EXISTING CURB & CONC ISLAND

EXISTING APPROACHES TO BE REMOVED AND REPLACED WITH FULL HEIGHT BARRIER CURB & GUTTER OPSD 600.040 (TYPICAL AT ALL UNUSED EXISTING ENTRANCES)

REMOVE AND DISPOSE OF EXISTING BOLLARDS (TYP ALL LOCATIONS)

REMOVE AND DISPOSE OF EXISTING CONCRETE

CONTRACTOR TO COORDINATE SERVICE DECOMMISSIONING AND REMOVAL OF EXISTING GAS SERVICE WITH ENBRIDGE

CONTRACTOR TO COORDINATE SERVICE DECOMMISSIONING AND REMOVAL OF TELECOMMUNICATION LINES WITH THE UTILITY OWNER

INSTALL SILT SACKS PER DETAIL ON THIS SHEET (TYP.)

LIGHT DUTY SILT FENCE

FRAME ADDITION
2 STOREY BRICK DWELLING No. 80
EX BELL MH
EX WV
EX WV

DEMOLISH EXISTING BUILDING AND DISPOSE OF OFF SITE

REMOVE EXISTING UNUSED DRIVEWAY APPROACH (TYP)

KENT STREET SOUTH

EXISTING CURBFACE SIDEWALK TO BE REMOVED AND REPLACED WITH NEW SITE ENTRANCE PER OPSD 350.010

LIMIT OF CURB CUT TO CREATE DROP CURB

EXISTING OVERHEAD LINES TO BE MAINTAINED

REMOVE AND RELOCATE EXISTING HYDRO POLE (DESIGN BY OTHERS)

REMOVE AND DISPOSE OF EXISTING FENCE (TYP)

EX SAN MH
EXISTING BELL PEDESTAL TO BE MAINTAINED

LIGHT DUTY SILT FENCE

EXISTING UTILITY POLE TO BE MAINTAINED

2 STOREY BRICK ADDITION
COMMERCIAL BUILDING No. 92
2 1/2 STOREY BRICK ADDITION

INSTALL SILT SACK IN EXISTING CATCHBASIN LOCATED IN FRONT OF 116 NORFOLK STREET SOUTH

WATER STREET
NORFOLK STREET SOUTH

North

LEGEND

Symbol	Description
0.2m DIA	EXISTING DECIDUOUS TREE
0.2m DIA	EXISTING CONIFEROUS TREE
	EXISTING TREE DRIPLINE AND/OR VEGETATION LINE
	EXISTING CONTOUR
	REMOVALS
	LIGHT DUTY SILT FENCE
SS	CATCHBASIN SILT SACK

DATE	ISSUANCE	NO.
2023.07.26	FIRST SUBMISSION IN SUPPORT OF SPA	1

CLIENT
CRESCENT HOMES
180 FROBISHER DRIVE, UNIT#3, WATERLOO

PROJECT
66 NORFOLK STREET SOUTH
TOWN OF SIMCOE
6-STOREY MIXED-USE DEVELOPMENT

TITLE
REMOVALS AND EROSION & SEDIMENT CONTROL PLAN

WALTERFEDY
KITCHENER | HAMILTON | TORONTO
800.685.1378   walterfedy.com

J.G. ORESKOVIC
25-July-2023

SCALE:	1:250
DATE:	2023-07-25
PROJECT NO.:	2022-0285-10
DRAWN BY:	MPB
CHECKED BY:	JO

SHEET NO.
C1-1

1:250 (m)

GENERAL GRADING NOTES

a) THIS PLAN IS NOT FOR CONSTRUCTION UNTIL SEALED BY THE ENGINEER AND APPROVED BY THE COUNTY OF NORFOLK.

b) ALL MATERIALS AND CONSTRUCTION METHODS TO BE AS PER THE COUNTY OF NORFOLK (LATEST REVISIONS) AND THE ONTARIO STANDARDS AND SPECIFICATIONS (LATEST REVISION).

c) REFER TO DRAWING C1-1 FOR CONSTRUCTION NOTES AND SPECIFICATIONS.

d) THE MAXIMUM LOT SURFACE GRADE FOR REAR YARDS SHALL BE 6%. A SLOPE OF 3:1 (3 PARTS HORIZONTAL TO 1 PART VERTICAL) SHALL BE USED TO TAKE UP ANY ADDITIONAL GRADE DIFFERENTIAL. OTHERWISE, AN APPROVE RETAINING WALL IS REQUIRED. IN ANY CASE, THE TOTAL GRADE DIFFERENTIAL OF REAR LOTS IS NOT TO EXCEED 15% INCLUDING RETAINING WALL AND 3:1 SLOPES. HOWEVER, THE REAR YARDS ARE TO HAVE A MINIMUM USABLE (CONTINUOUS SLOPE NOT EXCEEDING 6%) DEPTH OF 6 METRES FROM THE REAR OF THE BUILDING, IRRESPECTIVE OF THE 15%.

e) ALL BOULEVARD AREAS SHALL BE GRADED WITH A CONSTANT SLOPE FROM THE CURB TO THE STREET LIMIT (MINIMUM SLOPE TO BE 2%, MAXIMUM SLOPE TO BE 8%) AND ALL WATER BOXES, MANHOLE COVERS, VALVE BOXES, ETC. SHALL BE SET FLUSH WITH THE FINISHED SOD SURFACE. WHERE SIDEWALKS ARE REQUIRED WITHIN THE BOULEVARD THE MAXIMUM SLOPE FROM CURB TO PROPERTY LINE SHALL BE 4%.

f) ALL LOT SURFACES SHALL BE CONSTRUCTED TO A MINIMUM GRADE OF 2% (EXCLUDING REAR YARD SWALES).

g) THE GRADE OF ANY FRONT WALKWAY SHALL NOT EXCEED 8%.

h) REAR YARD CATCHBASINS AND OUTLET PIPES SHALL BE LOCATED SUCH THAT THE CATCHBASIN IS LOCATED ENTIRELY ON ONE LOT AND THE OUTLET PIPE IS LOCATED ON THE SAME LOT AT 0.35 METRE OFFSET FROM PROPERTY LINE. THE CENTRE OF THE CATCHBASIN SHOULD BE LOCATED 1.0M FROM PROPERTY LINES. 2.0M EASEMENTS ARE REQUIRED ON EITHER SIDE OF THE LOT FOR REAR LOT CATCHBASINS LEADS.

i) EXISTING CURB AT NEW DRIVEWAY ENTRANCES SHALL BE COMPLETELY REMOVED AND REPLACED WITH A STEEL REINFORCED DEPRESSED CURB SECTION.

j) *THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE CONSULTING ENGINEER 72 HOURS PRIOR TO COMMENCING THE SITE WORKS TO REQUEST INSPECTION. THE CONSULTING ENGINEER SHALL DETERMINE THE EXTENT OF INSPECTION AND TESTING REQUIRED FOR CERTIFICATION ON THE UNDERGROUND SERVICE INSTALLATION AS MANDATED BY THE ONTARIO BUILDING CODE DIVISION C, PART 1, SECTION 1.2.2, GENERAL REVIEW. FAILURE TO MAKE SUITABLE ARRANGEMENTS FOR INSPECTION WILL LEAD TO POST CONSTRUCTION TESTING AND INSPECTION AS DETERMINED BY THE ENGINEER. ALL COSTS ASSOCIATED WITH ANY REQUIRED POST CONSTRUCTION TESTING AND INSPECTION SHALL BE BORNE BY THE CONTRACTOR, INCLUDING ANY DELAYS TO CONSTRUCTION, NECESSARY REWORK AND RESTORATION OF DISTURBED WORKS. FINAL CERTIFICATION OF THE WORKS WILL BE WITHHELD UNTIL ALL POST CONSTRUCTION INSPECTION OF THE UN-INSPECTED WORKS IS COMPLETE TO THE SATISFACTION OF THE CONSULTING ENGINEER. FULL PAYMENT FOR UN-INSPECTED WORKS MAY BE WITHHELD UNTIL.*

SWALES

a) ALL REAR YARD DRAINAGE SHALL BE DIRECTED AWAY FROM THE BUILDINGS IN DEFINED SWALES WHICH OUTLET AT THE CURB, SIDEWALK, OR A CATCHBASIN.

b) THE MAXIMUM LENGTH OF A REAR YARD SWALE BETWEEN OUTLETS SHALL BE 90 METRES.

c) REAR AND SIDE YARD SWALES SHALL HAVE A MINIMUM SLOPE OF 1.5%. MAXIMUM DEPTH FOR ALL SWALES SHALL BE 0.5M. MAXIMUM SIDE SLOPE ON ANY SWALE SHALL BE 3:1.
SWALE SLOPES LESS THAN 1.5% SHALL REQUIRE 150mm PERFORATED SUBDRAIN.

RETAINING WALLS AND FENCES

a) ALL RETAINING WALLS ARE TO BE DRY-STONE (INTERLOCKING, STACKING TYPE NO TIEBACKS), OR REINFORCED CONCRETE. WHEN USED TO TAKE UP GRADE DIFFERENTIALS, OR ADJACENT TO PUBLIC PROPERTY, RETAINING WALLS SHALL BE DESIGNED BY A QUALIFIED STRUCTURAL ENGINEER AND BE APPROVED BY THE COUNTY.

b) A MINIMUM SETBACK OF 0.5 METRES SHALL BE MAINTAINED TO THE FOUNDATION OF ANY STRUCTURE.

c) ALL RETAINING WALLS 0.60M OR HIGHER REQUIRE PLACEMENT OF FENCING OR A GUARD ALONG THE TOP OF THE WALL, IN ACCORDANCE WITH THE ONTARIO BUILDING CODE.

TYPICAL SWALE X-SECTION
N.T.S.

SODDED SIDES AND BOTTOM ON 100mm TOPSOIL

TYPICAL SWALE X-SECTION WITH SUBDRAIN
N.T.S.

SODDED SIDES AND BOTTOM ON MIN. 100mm TOPSOIL

150mmØ PERFORATED PLASTIC PIPE SUBDRAIN (IF REQUIRED)

FILTER CLOTH

19mm CLEAR STONE BEDDING PLACED MIN. 150mm TOP & SIDES, 50mm UNDER PIPE

NOTE:
FOR SWALES LESS THAN 1.5% OR OTHERWISE NOTED

TYPICAL PARKING LOT X-SECTION
N.T.S.

MIN 0.5% MAX 6.0%

LIGHT DUTY
40mm OPSS HL-3 TOP COURSE ASPHALT(COMPACTED TO 97% MARSHALL BULK DENSITY)
50mm HL-8 BINDER COURSE ASPHALT (COMPACTED TO 97% MARSHALL BULK DENSITY)
150mm OPSS GRANULAR 'A'(COMPACTED TO 100% SPMDD)
300mm OPSS GRANULAR 'B', TYPE II (COMPACTED TO 100% SPMDD)

300x300mm NYLOPAST AREA DRAIN (OR APPROVED EQUIVALENT). REFER TO MECHANICAL PLANS FOR INTERNAL BUILDING CONNECTION DETAILS

NOTES
1. ALL THICKNESSES ARE AT COMPACTED DEPTHS.
2. GRANULAR BASE STRUCTURE NOT REQUIRED FOR ASPHALT AREAS ABOVE UNDERGROUND PARKING STRUCTURE.
3. PARKING LOT AREA DRAINS AND CATCHBASINS ARE TO CONNECT TO THE INTERNAL STORM SEWERS SYSTEM. REFER TO MECHANICAL PLANS FOR DETAILS.
4. THE ABOVE PAVEMENT STRUCTURE TO BE CONFIRMED BY A GEOTECHNICAL ENGINEER PRIOR TO CONSTRUCTION.

Plan labels

KENT STREET SOUTH

NORFOLK STREET SOUTH

WATER STREET

PROPOSED 6 STOREY MIXED-USE BUILDING
FFE = 212.10
2nd FFE = 211.90
BFE = 208.30

PROPOSED RETAINING WALL MAX HEIGHT = 0.45m

PROPOSED SWALE @ 1.6% c/w 150mmØ SUBDRAIN

PROPOSED SWALE @ 1.3% c/w 150mmØ PERFORATED SUBDRAIN

MATCH TO EXISTING ALONG PROPERTY LINE (TYP.)

PROPOSED SWALE @ MINIMUM 2.0%

MATCH TO EXISTING ALONG PROPERTY LINE @ MAX 3:1 SLOPE

PROPOSED 1.5m WIDE CURB DEPRESSION FOR STORMWATER OVERLAND FLOW ROUTE CURB TO BE CUT FLUSH WITH ASPHALT

DROP MAIN FLOOR SLAB TO 211.90 (APPROX LIMITS)

BUILDING CANOPY

PROPOSED BARRIER CURBS PER OPSD 600.110 (TYP)

PROPOSED DRIVEWAY ENTRANCE PER OPSD 350.010 TAPER CURB ENDS @ PROPERTY LINE

PROPOSED 1.5m WIDE CURB DEPRESSION

PROPOSED RAMP MAX 15.0% SLOPE

PROPOSED SWALE @ 1.5%

PROPOSED 2.0m WIDE CONCRETE SIDEWALK c/w HANDRAILS

MATCH TO EXIST SIDEWALK GRADES

NOTE: DRAINAGE FROM THE PARKING RAMP TO BE CAPTURED IN THE INTERNAL SYSTEM, REFER TO MECHANICAL DRAWINGS FOR DETAILS

ADJUST EXISTING ELEVATIONS @ PROPERTY LINE TO ENSURE MINIMUM 150mm SWALE DEPTH IS ACHIEVED

MIN. 1.67m LONG LANDING @ MAX 2.0%

LANDSCAPE/ PLANTER

COMMERCIAL BUILDING No. 92
2 1/2 STOREY BRICK ADDITION
2 STOREY BRICK ADDITION

North

LEGEND

[211.50]	PROPOSED ELEVATION
[211.50]EX.	MATCH TO EXISTING GRADE
2.0%	PROPOSED DRAINAGE ARROW/SLOPE
	PROPOSED SWALE
	PROPOSED SWALE WITH SUBDRAIN
	EXISTING DRAINAGE ARROW/SLOPE
	PROPOSED OVERLAND FLOW ROUTE
	EXISTING OVERLAND FLOW ROUTE
	EXISTING GROUND CONTOUR
	EXISTING DITCH CENTRELINE
	EXISTING DECIDUOUS TREE

Title block

DATE	ISSUANCE	NO.
2023.07.26	FIRST SUBMISSION IN SUPPORT OF SPA	1

CLIENT
CRESCENT HOMES
180 FROBISHER DRIVE, UNIT#3, WATERLOO

PROJECT
66 NORFOLK STREET SOUTH
TOWN OF SIMCOE
6-STOREY MIXED-USE DEVELOPMENT

TITLE
GRADING PLAN

WALTERFEDY
KITCHENER | HAMILTON | TORONTO
800.685.1378 walterfedy.com

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SCALE:	1:250	SHEET NO:
DATE:	2023-07-25	
PROJECT NO.:	2022-0285-10	**C2-1**
DRAWN BY:	MPB	
CHECKED BY:	JO	

SERVICING NOTES

1. THIS PLAN IS NOT FOR CONSTRUCTION UNTIL SEALED BY THE ENGINEER AND APPROVED BY THE COUNTY OF NORFOLK.

2. ALL MATERIALS AND CONSTRUCTION METHODS TO BE AS PER THE COUNTY OF NORFOLK (LATEST REVISIONS) AND THE ONTARIO STANDARDS AND SPECIFICATIONS (LATEST REVISION)

3. REFER TO DRAWING C1-1 FOR CONSTRUCTION NOTES AND SPECIFICATIONS.

4. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE CONSULTING ENGINEER 72 HOURS PRIOR TO COMMENCING THE SITE WORKS TO REQUEST INSPECTION. THE CONSULTING ENGINEER SHALL DETERMINE THE EXTENT OF INSPECTION AND TESTING REQUIRED FOR CERTIFICATION ON THE UNDERGROUND SERVICE INSTALLATION AS MANDATED BY THE ONTARIO BUILDING CODE DIVISION C, PART 1, SECTION 1.2.2, GENERAL REVIEW. FAILURE TO MAKE SUITABLE ARRANGEMENTS FOR INSPECTION WILL LEAD TO POST CONSTRUCTION TESTING AND INSPECTION AS DETERMINED BY THE ENGINEER. ALL COSTS ASSOCIATED WITH ANY REQUIRED POST CONSTRUCTION TESTING AND INSPECTION SHALL BE BORNE BY THE CONTRACTOR, INCLUDING ANY DELAYS TO CONSTRUCTION, NECESSARY REWORK AND RESTORATION OF DISTURBED WORKS. FINAL CERTIFICATION OF THE WORKS WILL BE WITHHELD UNTIL ALL POST CONSTRUCTION INSPECTION OF THE UN-INSPECTED WORKS IS COMPLETE TO THE SATISFACTION OF THE CONSULTING ENGINEER. FULL PAYMENT FOR UN-INSPECTED WORKS MAY BE WITHHELD UNTIL.

SANITARY SEWERS/SERVICES

1. THE MINIMUM COVER AT PROPERTY LINE SHALL BE 2.15M. THE MAXIMUM DEPTH AT PROPERTY LINE SHALL BE 2.7M.

2. IF NECESSARY, CONCRETE ENCASED RISERS SHALL BE PROVIDED FOR CONNECTION WITH THE MAIN SEWER. 2% MINIMUM GRADE SHALL BE MAINTAINED FOR CONNECTION PIPES.

3. NO DEFLECTIONS ALLOWED FROM MAIN TO PROPERTY LINE. AFTER THE PROPERTY LINE ONLY 22 ½ DEGREE FITTINGS ARE ALLOWED OR 1.2M, 45 DEGREE SWEEPS. CLEANOUTS ARE REQUIRED EVERY 30.5M AND PRIVATE MANHOLES EVERY 91.3M.

4. HORIZONTAL SEPARATION FROM WATER SERVICE CONNECTIONS OF NOT LESS THAN 2.44M MEASURED HORIZONTALLY FROM UNDISTURBED OR COMPACTED EARTH OR AS APPROVED BY THE MANGER OF ENVIRONMENTAL SERVICES.

5. 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.

STORM SEWERS/SERVICES

6. THE MINIMUM SIZE OF SERVICE SHALL BE 250MM.

7. ALL CONNECTIONS SHALL HAVE AN INSPECTION MANHOLE CONSTRUCTED ON THE MUNICIPAL RIGHT OF WAY WITHIN 1.5M OF THE PROPERTY LINE.

8. THE CONNECTION OF THE STORM DRAIN TO THE STORM SEWER MAY BE MADE AT AN EXISTING MANHOLE OR DIRECTLY TO THE STORM SEWER (IF THE SIZE OF THE CONNECTION IS LESS THAN HALF THE SIZE OF THE STORM SEWER). IF THE CONNECTION SIZE IS EQUAL TO OR GREATER THAN ONE HALF THE SIZE OF THE MAIN SEWER, THE CONNECTION MUST BE MADE TO A MANHOLE, EXISTING OR NEW, ON THE STORM SEWER.

9. STORM DRAIN CONNECTIONS SHALL BE CONSTRUCTED OF MINIMUM 150MM PVC (SDR 28) PIPE. STORM LATERALS FROM THE STORM MAINLINE IN THE ROAD ALLOWANCE SHALL BE WHITE IN COLOUR.

10. ALL STORM DRAIN CONNECTIONS SHALL BE INSTALLED USING TYPE B BEDDING USING 150 MM GRANULAR 'A' AS BEDDING AND 300MM OF GRANULAR A FOR COVER.

WATERMAINS/SERVICES

1. ALL WATER SERVICE CONNECTIONS WILL REQUIRE A CONNECTION PERMIT, WHICH CAN BE PURCHASED AT THE DELHI ADMINISTRATION BUILDING LOCATED AT 183 MAIN STREET OF DELHI, DELHI, ON N4B 2W6, 519-582-2100.

2. TAPPING SLEEVES SHALL CONFORM TO NORFOLK COUNTY'S APPROVED PRODUCT LIST. TAPPING VALVES SHALL OPEN LEFT (COUNTER CLOCKWISE) AND CLOSE RIGHT (CLOCKWISE). PRIOR TO THE TAP BEING PERFORMED THE CONNECTION MUST BE TESTED VIA THE TEST PORT WITH AIR TO AT LEAST 150 PSI TO CONFIRM THAT THE VALVE AND THE SLEEVE HAVE BEEN SECURED PROPERLY. ANY LEAKS AFTER THE TAP WITHIN THIS AREA WILL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR AND IF NECESSARY A TEE INSTALLED INSTEAD OF THE LIVE TAP.

3. ALL VALVES INSTALLED SHALL BE THE SAME SIZE AS THE WATERMAIN

4. ALL VALVES SHALL BE RESILIENT-SEATED GATE VALVES WHICH CONFORM TO AWWA C509 AND SHALL OPEN LEFT (COUNTER CLOCKWISE) AND CLOSE RIGHT (CLOCKWISE). ALL GATE VALVES SHALL HAVE NON-RISING STEMS, 50MM OPERATING NUTS AND MECHANICAL JOINT ENDS.

5. ALL WATER SERVICE SHALL BE INSTALLED AT RIGHT ANGLES TO THE WATERMAIN.

6. HYDRANT LEADS SHALL BE 150MM AND SHALL BE CONNECTED USING A GATE VALVE AND ANCHOR TEE.

7. PRIVATE HYDRANTS SHALL BE PAINTED AS PER NORFOLK COUNTY FIRE DEPARTMENT INSTRUCTIONS.

RELOCATIONS, REMOVALS AND ABANDONMENT NOTES

1. UNUSED WATER SERVICES WITHIN THE MUNICIPAL RIGHT-OF-WAY TO BE SHUT OFF AT THE MAIN STOP. THE PIPE SHALL BE DISCONNECTED FROM THE MAIN AND FULLY REMOVED WITHIN THE RIGHT OF WAY LIMITS UP TO AND INCLUDING THE CURBSTOP TO THE SATISFACTION OF THE COUNTY OF NORFOLK.

2. UNUSED SERVICE LATERALS (SANITARY AND STORM) ARE TO BE CAPPED AT THE MAIN AND THE UNUSED PIPE FULLY REMOVED WITHIN THE RIGHT OF WAY LIMITS TO THE SATISFACTION OF THE COUNTY OF NORFOLK.

3. UNUSED SERVICES WITHIN THE PRIVATE PROPERTY TO BE REMOVED/ABANDONED AS FOLLOWS:
   3.1. ALL PIPES WITHIN THE LIMITS OF THE BUILDING AND SERVICING TRENCH EXCAVATIONS SHALL BE REMOVED.
   3.2. WHERE WATER SERVICING PIPE DOES NOT INTERFERE WITH THE SERVICING AND BUILDING EXCAVATION, THE PIPE SHALL BE SAW CUT AT THE LIMITS OF THE EXCAVATIONS, AND MECHANICALLY CAPPED AND THE UNUSED PIPE ABANDONED.
   3.3. WHERE SERVICE LATERALS (SANITARY AND STORM) DO NOT INTERFERE WITH THE SERVICING AND BUILDING EXCAVATIONS, THE PIPE SHALL BE SAW CUT AT THE LIMITS OF THE EXCAVATION, FILLED WITH SAND AND MECHANICALLY CAPPED OR PLUGGED WITH A MINIMUM 0.5 METRE LONG 30MPa CONCRETE PLUG AND THE UNUSED PIPE ABANDONED.

4. EXCAVATIONS WITHIN THE RIGHT-OF-WAY TO BE BACKFILLED WITH GRANULAR "A", PLACED IN 300mm LIFTS AND COMPACTED TO 95% SPD OR AS DIRECTED BY THE GEOTECHNICAL CONSULTANT.

5. EXCAVATIONS WITHIN THE SITE TO BE BACKFILLED BE BACKFILLED WITH APPROVED SELECT NATIVE MATERIAL COMPACTED IN 300mm LIFTS AND COMPACTED TO 95% SPD OR AS DIRECTED BY THE GEOTECHNICAL CONSULTANT. IN THE EVENT THAT THE NATIVE MATERIAL IS FOUND TO BE UNSUITABLE, THE EXCAVATIONS SHALL BE BACKFILLED WITH GRANULAR "A" OR APPROVED ALTERNATIVE.

6. REFER TO SHEET C1-1 FOR ADDITIONAL RELOCATION, REMOVAL AND ABANDONMENT NOTES.

UNDERGROUND STORAGE

TYPE	STORMTECH SC-740 OR APPROVED EQUAL
SIZE (h x w x l)	1.06 x 6.20 x 31.20m
EFFECTIVE STORAGE	133.00m³
TOP OF CLEAR STONE ELEVATION	210.91
TOP OF CHAMBER UNIT ELEVATION	210.76
BOTTOM OF CHAMBER UNIT ELEVATION	210.00
BOTTOM OF BASE CLEAR STONE ELEVATION	209.85

NOTE: ALL JOINTS AND PIPE CONNECTIONS TO BE SEALED PER SUPPLIERS SPECS. BACKFILL AND INSTALLATION DETAILS PER SUPPLIER'S SPECS. SEE SHOP DRAWINGS (BY OTHERS) FOR DESIGN DETAILS AND SPECIFICATIONS. INSTALLATION TO BE CERTIFIED BY AN APPROVED REPRESENTATIVE OF ADS®.

CONTRACTOR TO PROVIDE SHOP DRAWINGS

SEWER CROSSING TABLE

CROSSING #	INVERT	OBVERT	DIFFERENCE
1	209.45 STM	209.25 EX. SAN	0.20m
2	209.53 STM	209.03 EX. WM	*0.50m

*NOTE:
VERTICAL SEPARATION BETWEEN SEWER DRAINS AND WATERMAINS SHALL BE MINIMUM 0.5m PER MINISTRY OF ENVIRONMENT (MOE) GUIDELINES.

LEGEND

- ← PROPOSED SANITARY SEWER/SERVICE
- ← PROPOSED STORM SEWER/SERVICE
- ← PROPOSED WATERMAIN/SERVICE
- EXISTING SANITARY SERVICE
- EXISTING STORM SERVICE
- EXISTING WATERMAIN
- WV PROPOSED WATERMAIN VALVE
- M PROPOSED WATER METER
- MH PROPOSED STORM MANHOLE
- MHA PROPOSED SANITARY MANHOLE
- DV PROPOSED DOUBLE CHECK VALVE ASSEMBLY
- BP PROPOSED BACKFLOW PREVENTOR
- AD PROPOSED STORM AREA DRAIN
- DICB(A) PROPOSED DITCH INLET CATCHBASIN (TYPE A)
- EX CB EXISTING CATCHBASIN
- EX MH EXISTING STORM MANHOLE
- EX SAN MH EXISTING SANITARY MANHOLE
- EX HYD EXISTING FIRE HYDRANT
- CR2 SERVICE CROSSING LOCATION

CRESCENT HOMES

CLIENT
CRESCENT HOMES
180 FROBISHER DRIVE, UNIT#3, WATERLOO

PROJECT
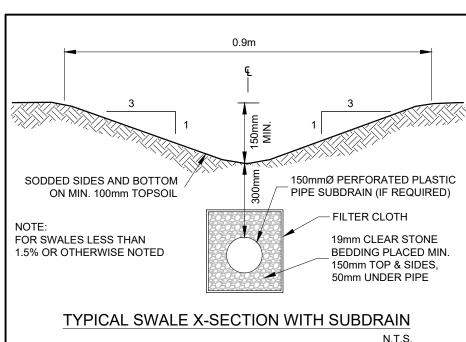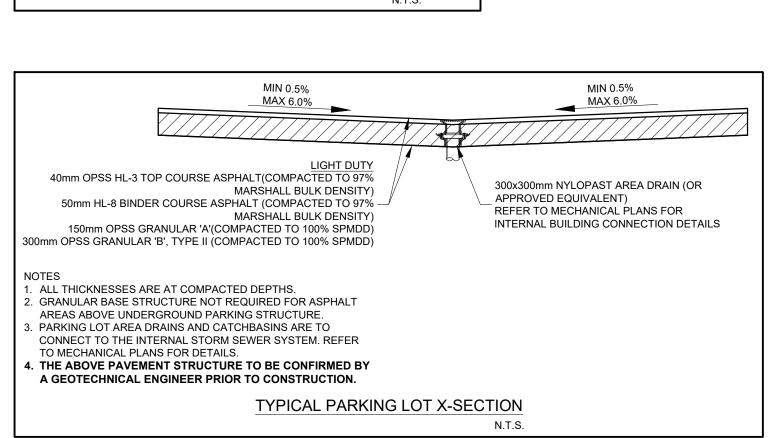66 NORFOLK STREET SOUTH
TOWN OF SIMCOE
6-STOREY MIXED-USE DEVELOPMENT

TITLE
SERVICING PLAN

WALTERFEDY
KITCHENER | HAMILTON | TORONTO
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DATE	ISSUANCE	NO.
2023.07.26	FIRST SUBMISSION IN SUPPORT OF SPA	1

SCALE: 1:250
DATE: 2023-07-25
PROJECT NO: 2022-0285-10
DRAWN BY: MPB
CHECKED BY: JO

SHEET NO.
C3-1

CONTROL MANHOLE (MH3)
(SHOP DRAWINGS TO BE PROVIDED)
N.T.S - MANHOLE STRUCTURE MAY NOT BE EXACTLY AS SHOWN

NOTES:
1. INSTALL ORIFICE CONTROL PRIOR TO PLACING CAP.
2. ORIFICE CONTROL TO BE UNIFORM STEEL SECTION WITH NO OPEN SEAMS. MATERIAL TO BE MIN 3mm THICK GALVANIZED STEEL OR ALUMINUM
3. CONTROL FEATURES MUST BE INSTALLED AND INSPECTED BY THE ENGINEER PRIOR TO PAVING TO ENSURE STORMWATER RUNOFF FLOW CONTROLS ARE IN PLACE TO PROTECT DOWNSTREAM SYSTEM.

WATERMAIN DEFLECTION
SCALE: 1:50

ASPHALT RESTORATION DETAIL
N.T.S.

BEDDING DETAIL
N.T.S.

PIPE INSULATION DETAIL
N.T.S.

Hydroworks HydroStorm

66 NORFOLK

66 NORFOLK ST. S, SIMCOE, ON N3Y 2W2

PRELIMINARY DESIGN

ISSUED ON 2023.07.07

aba
architects inc.

PEEL ST.

KENT ST. S

NORFOLK ST. S

0m MINIMUM INTERIOR SIDE YARD SETBACK

0m MINIMUM INTERIOR SIDE YARD SETBACK

0m MINIMUM REAR YARD SETBACK

LEVELS 2-6 ABOVE

**PROPOSED 6 STOREY
MIXED USE BUILDING
103 UNITS**

LEVELS 5-6 ABOVE

0m MINIMUM FRONT YARD SETBACK

10

7

7

2

11

31330

14106

13681

1

EXTENT OF UNDERGROUND
PARKING SHOWN DASHED

0m MINIMUM INTERIOR SIDE YARD SETBACK

PROJECT NO. 2022-044

66 NORFOLK

■ SITE PLAN

1:500
2023.07.07

0m   5   10   25   50

1.4

STAIR

7650

3300

STAIR

UNEXCAVATED

12.0% UP   6.0% UP

7300

5800

7300

5800

FLOOR PLANS
LEVEL P1

1:300
2023.07.07

STUDIO
1 BED
2 BED
3 BED
AMENITY
COMMERCIAL
OFFICE
PARKING

2.1

AMENITY
116.6 m²
1256 ft²

COMMERCIAL
125.1 m²
1347 ft²

LOBBY

GARBAGE ROOM

MOVE-IN

STAIR

SERVICE

SERVICE

STAIR

SERVICE

COMMERCIAL
250.6 m²
2698 ft²

SERVICE

6.0% DN   12.0% DN

A
B
C
D
E
F
G
H
J
K
L
M
N
P
Q
R

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

FLOOR PLANS
LEVEL 1

1:200
2023.07.07

STUDIO
1 BED
2 BED
3 BED
AMENITY
COMMERCIAL
OFFICE
PARKING

2.2

Floor Plan — Level 2-4

| Grid | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |

Row A–D (top):

| **1 BED** 75.0 m² 807 ft² | **1 BED** 69.3 m² 746 ft² | **1 BED** 70.0 m² 753 ft² | **1 BED** 70.0 m² 753 ft² | **1 BED** 70.0 m² 753 ft² | **1 BED** 70.0 m² 753 ft² | **1 BED** 70.0 m² 753 ft² | **1 BED** 64.5 m² 694 ft² | **2 BED** 98.2 m² 1057 ft² |

Row E–J (middle):

| **2 BED** 86.0 m² 926 ft² | STAIR | **2 BED** 113.7 m² 1224 ft² | **1 BED** 69.3 m² 746 ft² | **1 BED** 69.3 m² 746 ft² | **1 BED** 69.3 m² 746 ft² | **1 BED** 85.6 m² 922 ft² | **1 BED** 66.5 m² 716 ft² |

Lower wing:

| **1 BED** 65.9 m² 709 ft² |
| **1 BED** 80.7 m² 868 ft² | **2 BED** 124.9 m² 1344 ft² |
| STAIR |
| **1 BED** 69.8 m² 751 ft² | **2 BED** 85.3 m² 919 ft² |

Legend:
- ■ STUDIO
- ■ 1 BED
- ■ 2 BED
- ■ 3 BED
- ■ AMENITY
- ■ COMMERCIAL
- ■ OFFICE
- ■ PARKING

66 NORFOLK

PROJECT NO. 2022-044

1 BED
75.0 m²
807 ft²

1 BED
69.3 m²
746 ft²

1 BED
70.0 m²
753 ft²

1 BED
70.0 m²
753 ft²

1 BED
70.0 m²
753 ft²

1 BED
70.0 m²
753 ft²

1 BED
70.0 m²
753 ft²

1 BED
64.5 m²
694 ft²

2 BED
98.0 m²
1055 ft²

2 BED
86.0 m²
926 ft²

STAIR

2 BED
113.9 m²
1226 ft²

1 BED
69.3 m²
746 ft²

1 BED
69.3 m²
746 ft²

1 BED
69.3 m²
746 ft²

1 BED
85.6 m²
922 ft²

2 BED
85.3 m²
919 ft²

1 BED
80.7 m²
868 ft²

2 BED
101.1 m²
1089 ft²

STAIR

1 BED
69.6 m²
750 ft²

2 BED
74.6 m²
803 ft²

FLOOR PLANS
LEVEL 5

1:200
2023.07.07

STUDIO
1 BED
2 BED
3 BED
AMENITY
COMMERCIAL
OFFICE
PARKING

2.4

PROJECT NO. 2022-044

66 NORFOLK

1 BED
75.0 m²
807 ft²

1 BED
69.3 m²
746 ft²

1 BED
70.0 m²
753 ft²

1 BED
70.0 m²
753 ft²

1 BED
70.0 m²
753 ft²

1 BED
70.0 m²
753 ft²

1 BED
70.0 m²
753 ft²

1 BED
64.5 m²
694 ft²

2 BED
98.0 m²
1055 ft²

2 BED
86.0 m²
926 ft²

STAIR

2 BED
113.8 m²
1225 ft²

1 BED
69.3 m²
746 ft²

1 BED
69.3 m²
746 ft²

1 BED
69.3 m²
746 ft²

1 BED
85.6 m²
922 ft²

2 BED
85.3 m²
919 ft²

1 BED
80.7 m²
868 ft²

2 BED
101.1 m²
1089 ft²

STAIR

1 BED
69.6 m²
750 ft²

2 BED
74.6 m²
803 ft²

FLOOR PLANS
LEVEL 6

1:200
2023.07.07

■ STUDIO
■ 1 BED
■ 2 BED
■ 3 BED
■ AMENITY
■ COMMERCIAL
■ OFFICE
■ PARKING

2.5

① ② ③ ④⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑮ ⑯⑰ ⑱ ⑲⑳

Ⓐ
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Ⓡ

**MECH.
PENTHOUSE**
199.5 m²
2147 ft²

STAIR

FLOOR PLANS
ROOF PLAN

1:200
2023.07.07

■ STUDIO
■ 1 BED
■ 2 BED
■ 3 BED
■ AMENITY
■ COMMERCIAL
■ OFFICE
■ PARKING

2.6

R Q P N M L K J HG F E D C B A

ROOF
125.50

3800

MECHANICAL PENTHOUSE
121.70

3600

LEVEL 6
118.10

3600

LEVEL 5
114.50

3600

LEVEL 4
110.90

3200

LEVEL 3
107.70

21700

3200

LEVEL 2
104.50

4500

LEVEL 1
100.00

3800

LEVEL P1
96.20

ELEVATION
EAST ELEVATION

1:300
2023.07.07

3.1

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

ROOF
125.50

3800

MECHANICAL PENTHOUSE
121.70

3600

LEVEL 6
118.10

3600

LEVEL 5
114.50

3600   21700

LEVEL 4
110.90

3200

LEVEL 3
107.70

3200

LEVEL 2
104.50

4500

LEVEL 1
100.00

3800

LEVEL P1
96.20

ELEVATION
SOUTH ELEVATION

1:300
2023.07.07

0m 2 4 10 20

3.2

A B C D E F G H J K L M N P Q R

ROOF
125.50

MECHANICAL PENTHOUSE
121.70

LEVEL 6
118.10

LEVEL 5
114.50

LEVEL 4
110.90

LEVEL 3
107.70

LEVEL 2
104.50

LEVEL 1
100.00

LEVEL P1
96.20

3800
3800
3600
3600
3600
3200
3200
4500
3800
3800

21700

66 NORFOLK ST. S

ELEVATION
WEST ELEVATION

1:300
2023.07.07

0m 2 4 10 20

3.3

ROOF
125.50

MECHANICAL PENTHOUSE
121.70

LEVEL 6
118.10

LEVEL 5
114.50

LEVEL 4
110.90

LEVEL 3
107.70

LEVEL 2
104.50

LEVEL 1
100.00

LEVEL P1
96.20

3800
3600
3600
3600
3200
3200
4500
3800
21700

ELEVATION
NORTH ELEVATION

1:300
2023.07.07

0m 2 4 10 20

3.4