FUNCTIONAL SERVICING REPORT
400 LANARK SUBDIVISION

Project No.: CCO-22-0957

Prepared for:

Wintergreen Ridge Ltd

Prepared by:

McIntosh Perry Consulting Engineers Ltd.
115 Walgreen Road
Carp, ON K0A 1L0

September 15th, 2023

McINTOSH PERRY

TABLE OF CONTENTS

LIST OF TABLES

APPENDICES

1.0 PROJECT DESCRIPTION

1.1 Purpose

McIntosh Perry (MP) has been retained by Wintergreen Ridge Ltd. to prepare this Servicing Report in support of the Plan of Subdivision process and stormwater management report for the proposed 400 Lanark Subdivision, located in the Town of Carleton Place, Ontario.

The main purpose of this report is to present a servicing design for the development in accordance with the recommendations and guidelines provided by the Town of Carleton Place, the Mississippi Valley Conservation Authority (MVCA), and the Ministry of the Environment, Conservation and Parks (MECP). This report will address the water, sanitary and storm sewer servicing for the development, ensuring that existing and available services will adequately service the proposed development.

This report should be read in conjunction with the following drawings:

- CCO-22-0957 – General Plan of Services
- CCO-22-0957 – Conceptual Grading Plan
- CCO-22-0957 – Conceptual Storm Servicing Plan
- CCO-22-0957 – Conceptual Sanitary Servicing Plan

1.2 Site Description

The property is located in the Town of Carleton Place, Ontario. It is described as Part of Lot 1, Concession 7 in the geographic Township of Ramsay. The site is bounded by Lanark Street to the Northeast, Edmund Street to the Southwest, Town Line Road East to the Southeast, and undeveloped lands to the Northwest. The development area for the proposed works is approximately 8.19ha.

See Site Location Plan in Appendix 'A' for more details.

The existing site is currently undeveloped. Proposed Watermain, Sanitary, and Storm stubs are planned to be extended from proposed Carleton / Lanark Development across Lanark Street Northeast of this site.

The proposed development consists of thirty-five (35) single family units, ninety (90) townhouse units and one hundred-twenty-five (125) apartment units. There will be two site accesses for the development the first is from Lanark Street to the North East and the second is from Edmund Street to the South West both will be connected through a future roadway that offers a through connection between the two (2) access points.

2.0 BACKROUND STUDIES

Background studies that have been completed for the proposed site include As-built drawings, a topographical survey, a geotechnical report and a Phase I Environmental Site Assessment (ESA) prepared in support of Draft Approval.

As-built drawings of existing services and roads as well as the proposed adjacent development were reviewed in order to determine accurate servicing and stormwater management schemes for the site.

A topographic survey of the site was completed by McIntosh Perry Surveying Inc (MPSI).

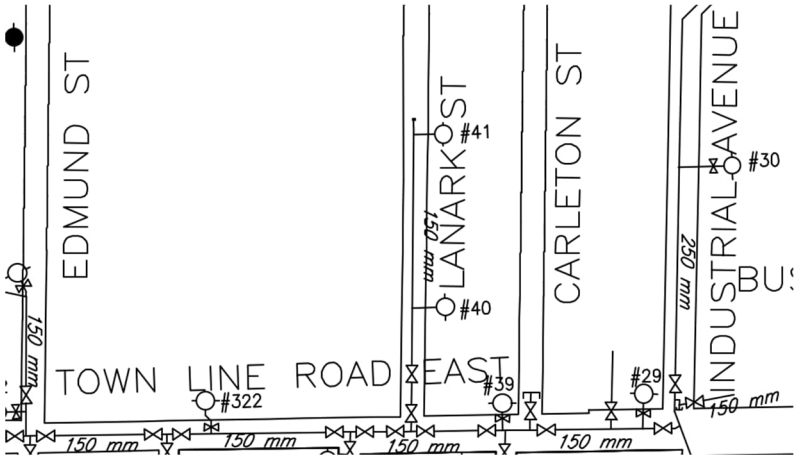
The following reports have previously been completed and are available under separate cover:

- Geotechnical Investigation – Kollaard Associates Engineers (Oct. 2014).
- Plan of Survey with Topography – McIntosh Perry Surveying Inc. (Nov. 2022).
- Industrial Avenue Sewage Pumping Station – McIntosh Perry Consulting Engineers Ltd. (Nov. 2015).
- Carleton / Lanark Inversness Servicing Report – Robinson Consultants Inc. (Dec. 2022).
- Phase I Environmental Site Assessment – Watter Environmental Group (June. 2021).
- Scope Environmental Impact Statement and Tree Preservation Plan – McIntosh Perry Consulting Engineers Ltd. (August. 2023)

3.0 WATERMAIN

3.1 Existing Water Servicing Conditions

This site is surrounding by three (3) streets of Lanark Street, Edmund Street, and Town Line Road East. Each street has a 150mm diameter Watermain. Lanark Street terminates approximately 210m North of Town Line Road East where there is a future proposed 203mm diameter watermain with the Carleton / Lanark Subdivision. Edmund Streets watermain terminates approximately 80m North of Town Line Road East. As part of the future Carleton / Lanark Development there is a proposed 203mm diameter watermain stub for the connection of this site, which is connected to a 250mm diameter watermain on Industrial Avenue.



3.2 Proposed Water Servicing

The proposed water distribution system will consist of 200mm diameter watermain piping and the applicable appurtenances to provide water for domestic consumption and fire protection. Five new fire hydrants are proposed to provide fire protection for the development. Water supply for each single-family home and townhome will be provided by individual water service connections to the proposed municipal watermain. A future connection to the municipal main will be provided to service the proposed apartments. Curb stops will be installed on all water services at the property line, away from driveways and any aboveground utilities. The watermain is designed to have a minimum of 2.4m cover.

3.3 Water Servicing Design Criteria

The design parameters that were used to establish water consumption and fire flow demands are summarized Table 1 below.

Table 1: Summary of Water Supply Design Criteria

Design Parameter	Value
Population Density – Single-family Home	3.4 persons/unit
Population Density – Townhome or Terrace Flat	2.7 persons/unit
Population Density – Average Apartment	1.8 persons/unit
Estimated Population Range (Full Development)	500-1000 person
Average Day Demands – Residential	280 L/person/day
Maximum Day Factor – Residential (MECP Table 3-1)	2.75 x Average Day Demands
Peak Hour Factor – Residential (MECP Table 3-1)	4.13 x Average Day Demands
Maximum Allowable Operating Pressure	551.6 kPa (80 psi)
Minimum Allowable Operating Pressure	275.8 kPa (40 psi)

3.4 Estimated Water Demands

Table 2 below summarizes the anticipated domestic water demands for all units (single family home, townhomes and apartments) under average day, maximum day and peak hour conditions.

Table 2: Total Water Demand Summary

Water Demand Conditions	Water Demands (L/sec)
Average Day	2.27
Max Day	6.24
Peak Hour	9.37

3.5 Fire Flow Requirements

Water for fire protection will be available by utilizing the proposed fire hydrants located along the proposed roadways. The required fire flows for all proposed buildings were calculated based on typical values as established

by the Fire Underwriters Survey 2020 (FUS). Fire flow calculations were also completed based on the Ontario Building Code (OBC) method for determining required fire flows, however the FUS method was used as it resulted in more conservative requirements. Detailed calculations for both methods are provided in Appendix C. The design parameters that were used to establish Required Fire Flows (RFF) are summarized in Table 1 below.

Table 3: Fire Flow Design Parameters

Design Parameter	Single Family	Townhome	Apartment
Type of Construction	Wood Frame	Wood Frame	Wood Frame
Maximum Effective Floor Area (2-Storey c/w Basement >50% Below Grade)	400m^2	1,070m^2	4,500 m^2
Occupancy Type	-15% Limited Combustible (Residential)	-15% Limited Combustible (Residential)	-15% Limited Combustible (Residential)
Sprinkler Protection System	None Provided	None Provided	Automatic sprinkler conforms to NFPA 13
Maximum Increase from Exposures	44%	32%	15%
Maximum Required Fire Flow	150 L/sec	200 L/sec (167 L/sec CAP)	250 L/sec

The maximum allowable footprints based on zoning setbacks were used to determine the RFFs for the single family and townhouse units. As per the City of Ottawa's Technical Bulletin ISTB-2018-02, the required fire flows for single and townhomes can be capped at 167 L/sec as there is more then 10m of spatial separation between the backs of adjacent units and the footprint of the townhome blocks are less than 600m^2. Detailed calculations of the RFFs necessary for each building is provided in Appendix C. The estimated required fire flows (RFFs) based on the FUS Method ranges from 150 L/sec for single family homes, 167 L/sec L/sec for townhomes blocks. Fire flow requirements for the proposed future apartment block will be determined prior to construction to ensure sufficient flows are available.

3.6 Boundary Conditions

Hydraulic Grade Line (HGL) boundary conditions were estimated for design purposes based on the hydraulic water model of the Town's water distribution system prepared by J.L. Richards & Associates (JLR) dated March 11, 2021, for the Town of Carleton Place.

A separate water model was prepared to specifically analyze the 400 Lanark development using the JLR water model results at the following three junctions.

Table 4: Boundary Conditions and Pressures Summary

Demand Scenario	Edmund Street Junction J-972	Lanark Street Junction J-191	Industrial Avenue via Carleton / Lanark Subdivision Junction J-262
Approximate Ground Elevation	146.00m	137.50m	137.00m
Average Day (Maximum HGL)	182.03m	182.02m	182.01m
Peak Hour (Minimum HGL)	180.02m	180.04m	179.97m

For the purposes of design, the provided Peak Hour HGL was reduced by 15 meters of head (~21 psi) as a safety factor while simulating the Maximum Day plus Fire Flow scenario for the development, equating to approximately 45-50 psi of pressure within the main at the boundary conditions.

3.7 Modelling Scenarios

A total of three (3) scenarios were analyzed. The performance of the proposed water distribution system within the development was analyzed under each scenario. The following summarizes the modelling scenarios that were analyzed.

Scenario 1: Average Day Demands (w/ Maximum HGL)

Scenario 2: Peak Hour Demands (w/ Minimum HGL)

Scenario 3: Max Day Plus Fire Flow (w/ Reduced Minimum HGL)

Scenario details for each model can be found in Appendix C.

3.1 Water Modeling Results

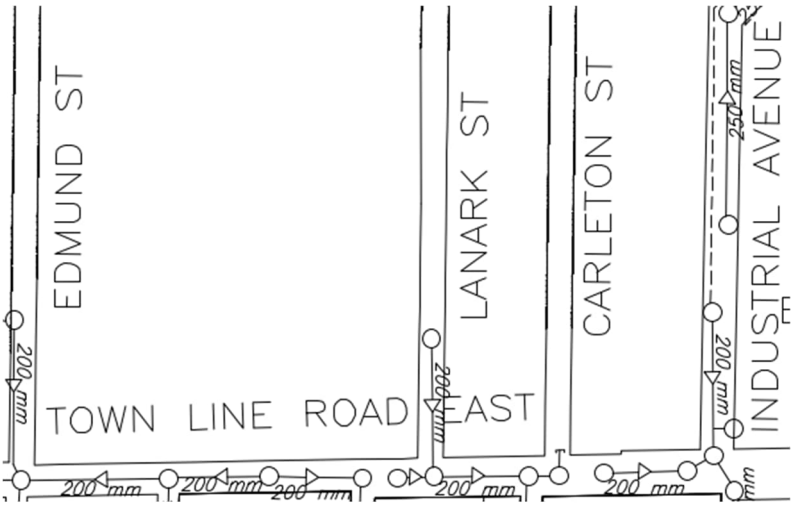
The calculated range of working pressures will be confirmed during detailed design once the structures and layout have been finalized. The calculated range of working pressures anticipated within the development under average day conditions were between 55 psi and 60 psi, and under peak hour conditions were between 50 psi and 57 psi. This meets the minimum 40psi pressure requirement as stated by the MECP guidelines. No pressure reducing measures are required as operating pressures are within 40 psi and 80 psi.

Under Maximum Day plus Fire Flow conditions the available fire flows are adequate compared to the required fire flows (RFF) based on a water distribution system with two (2) proposed connections to existing adjacent watermains. Additional measures for upsizing watermain are required to attain the RRF. Detailed design demand calculations and additional connections will be explore as part of the detailed design to determine if the RFF will be reduced. Current calculations are conservative upon the finalization of the proposed structures size, location, and construction material. As part of the proposed design a 250mm watermain is required under the main line through the development as well as the loop to the North-West where the proposed apartments are located. The remaining watermain are to have a proposed size of 200mm, with the apartment building to the South-East connecting directly to Townline Road.

4.0 SANITARY SEWER

4.1 Existing Sanitary Sewer

There is an existing 200mm diameter sanitary sewer located on Lanark Street, Edmund Street, and Town Line Road East. The servicing report completed by the Carleton / Lanark Subdivision determined that the sewers that are services from the existing sanitary services along Town Line Road East are of substandard installation. As a result this site shall not be serviced by any of the existing sanitary sewers along Lanark Street, Edmund Street, or Town Line Road East. As part of the future proposed Carleton / Lanark development there will be a 200mm diameter sanitary stub for this site to use for sanitary servicing.



4.2 Proposed Sanitary Sewer

New 200mm diameter gravity sanitary sewers are proposed to service this development and connect to the future proposed 200mm diameter stub as part of the Carleton / Lanark Development which is to be serviced using the existing 200mm diameter sanitary sewer along Industrial Avenue.

The peak design flows for the proposed residential units were calculated using criteria from the *City of Ottawa – Sewer Design Guidelines, October 2012*. The proposed site development area (8.19ha) will generate a flow of 8.83 L/s.

The proposed gravity sanitary sewers will be installed throughout the subject property with a minimum full flow target velocity (cleansing velocity) of 0.6 m/s and a full flow velocity of not more than 3.0 m/s. This may not be feasible on every length of pipe. This issue has been dealt with by increasing the slopes of the sanitary sewers. Design parameters for the site include an infiltration rate of 0.33 l/s/ha.

The proposed sanitary main will be connected to sanitary stub from the future proposed Carleton / Lanark Development to the Northeast of the property under the proposed road connection to Lanark Street. It is anticipated that there will be no issues with capacity constraints within the existing 200mm sanitary main within the downstream external sanitary sewer.

See *Onsite Sanitary Sewer Design Sheets* in Appendix D of this report for more details.

4.2.1 *Adequacy Assessment*

The purpose of this assessment is to confirm the existing sanitary infrastructure can adequately convey flows from the 400 Lanark Subdivision. Please see Figure 1 below for a visual of the contributing property parcels included in this assessment. The population breakdown has also been included in Table 5 in Section 4.2.1 below.

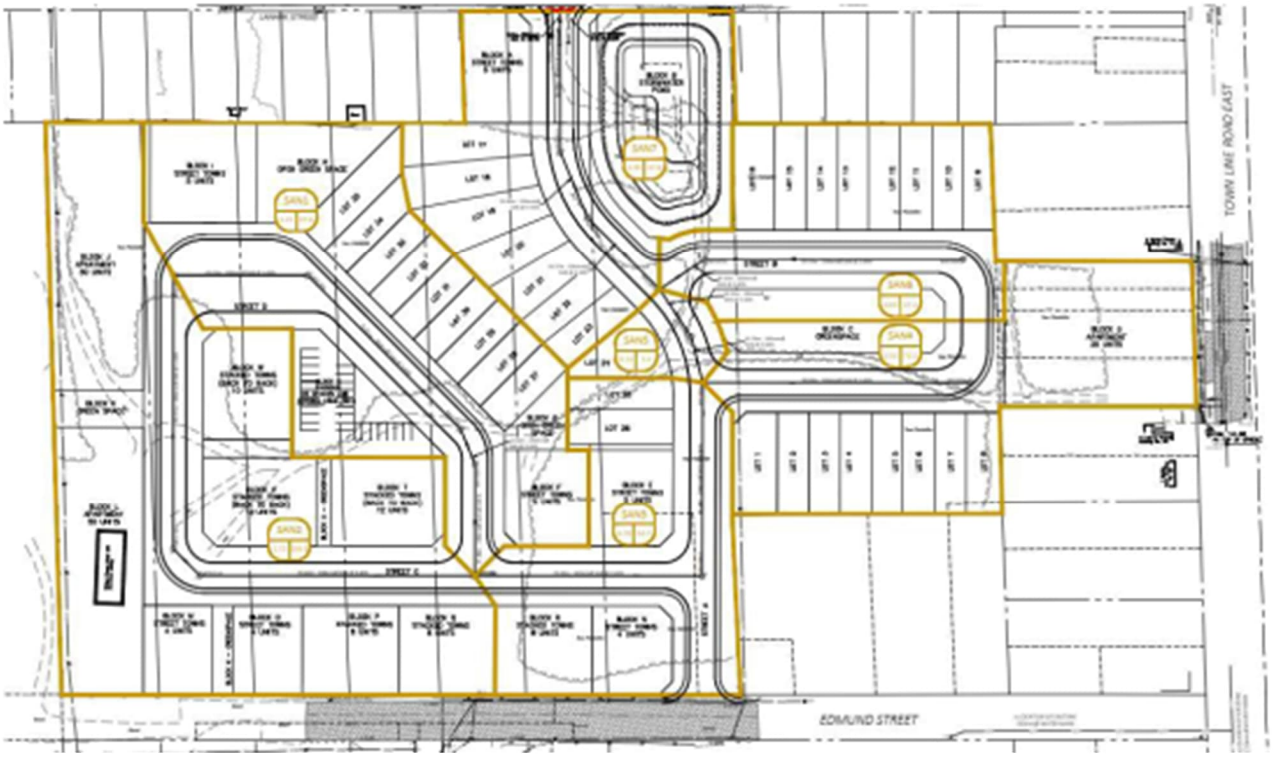


Figure 1 - Sanitary Drainage Areas

See onsite *Sanitary Sewer Design Sheet – Assessment 1* in Appendix D of this report for more details.

Populations for the areas have been further broken down in the Tables below:

Table 5: Population by Unit Type

Area ID	Area (ha)	Unit Types					Resulting Population
		SF	SD	TH	APT	APT (1-Bd)	
SAN1	1.21	9	-	10	-	-	58
SAN2	1.72	-	-	58	100	-	337
SAN3	0.70	2	-	17	0	-	53
SAN4	0.92	8	-	-	25	-	73
SAN5	0.10	1	-	-	-	-	3
SAN6	0.65	8	-	-	-	-	27
SAN7	0.95	7	-	5	-	-	37
Total							588

Table 6: Population by Area

Area ID	Area (ha)	Resulting Population
SAN1	1.21	58
SAN2	1.72	337
SAN3	0.70	53
SAN4	0.92	73
SAN5	0.10	3
SAN6	0.65	27
SAN7	0.95	37
Total from Site		588

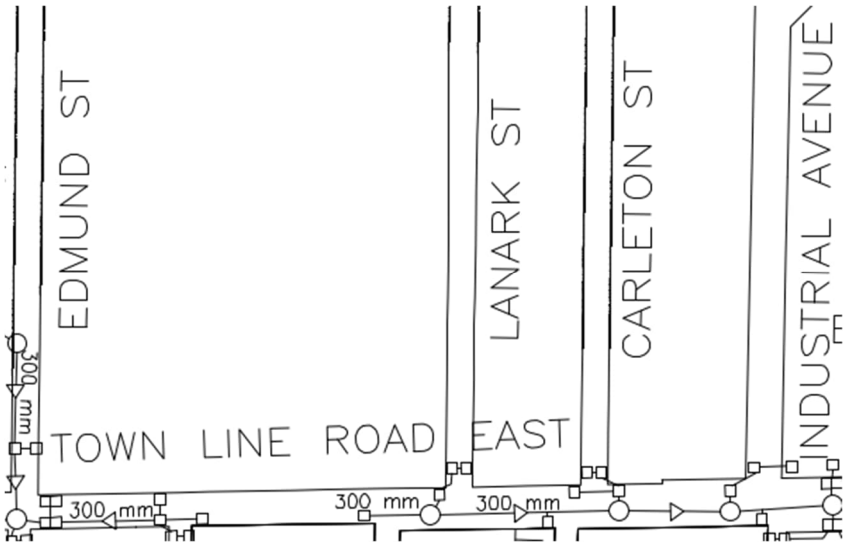
Notes:

- **Residential contributing areas only shown where unit type breakdown is not available or number of units is unknown.*
- *Design Populations for the table above are based on the following (taken from the City of Ottawa Sewer Design Guidelines):*
    - *Residential*
        - *SF – 3.4 p/p/u*
        - *TH/SD – 2.7 p/p/u*
        - *APT – 1.8 p/p/u*
        - *APT (1bd) – 1.4 p/p/u*
        - *Area Weighted – 60 p/p/ha*

5.0 STORM SEWER

5.1 Existing Storm Sewers

The subject property is currently undeveloped and without storm services. There is an existing storm network within the adjacent future proposed Carleton / Lanark Subdivision with a 900mm diameter storm stub for connection from this site. There is a new stormwater management facility is proposed to capture runoff from the proposed works. This system will outlet to the stub from the adjacent development that outlets to Industrial Avenue. On the roads adjacent to the development there is a 300mm diameter system on Town Line Road East and a 300mm diameter system along Edmund Street which terminated at a manhole at the Carambeck Community Centre approximately 130m North of Town Line Road East.



5.2 Proposed Storm Sewers

Please refer to the stormwater management report for the detailed discussion on the proposed storm sewer system. A preliminary storm sewer design sheet was created using the rational method, which allows for the proper sizing of the storm pipes within the development. Drainage area information, along with respective pipe slopes and other necessary information was utilized to evaluate the performance of the storm sewer network. The time of concentration calculated for the storm sewer system is based on a 15-minute inlet time.

The preliminary storm sewer design sheet identifies the 5-year flow that is conveyed through each pipe section of the storm sewer network. The peak flow and peak velocity are the maximum results based on gravity flow. Included in the sheet is the full flow capacity of the pipe and the associated full flow velocity, when the pipe is under gravity flow condition. The peak flow was checked against the full flow capacity to ensure that each storm sewer pipe can convey the 5-year flow unrestricted.

See Storm Sewer Design Sheet in Appendix 'E' of this report for more details.

A preliminary review of the updated HGL results indicates that, though there are increases, the increased elevations remain below the USF elevations. Additional analysis will be required to confirm this during the detailed design stage.

6.0 INSPECTION AND MAINTENANCE CONSIDERATIONS

Inspection and maintenance of SWM facilities is crucial to ensure the ongoing performance and effectiveness of such facilities throughout its lifecycle. It should be noted that a proper functional SWM plan can prevent future ponding, erosion and sedimentation from occurring and can significantly improve the quality of runoff leaving the site.

To ensure the SWM facilities function properly, routine inspection is required. Inspections will determine whether maintenance is required to any parts of the facilities. Inspections on site shall be completed a minimum of bi-annually, once following the spring freshet and once in the fall prior to freeze up (October).

After routine inspections are done for the facilities, a series of maintenance requirements will potentially need to be completed. Based on the type of work the maintenance activity can be categorized into Routine/Non-routine maintenance. The following tables illustrates some general maintenance activities and their frequency for considerations.

Table 7: General Maintenance Activities

Task	Required Equipment	Objective	Frequency
Grass cutting	Lawn mowers	To provide unobstructive conveyance pathways and to improve the aesthetic of the site	Routine – once per month or as required
Weed removal	Weed trimmers	To remove unwanted and invasive species of plants which could impede the conveyance and storage capacity of SWM facilities	Routine – once per month or as required
Trash removal	Gloves, garbage bags and garbage picker	To provide unobstructed drainage pathways and to minimize the clogging of outfall structures	Routine – once per month or as required
Grading of roadways and repair to erosion. Small scale - rills, ruts, isolated potholes. Large scale - eroded roadway, irregular cross-fall etc.	Small scale – Rakes, tamper, granular materials Large Scale – Grader, granular materials	To minimize the sediment transport, to avoid clogging of catchbasins and to mitigate erosion	Non-Routine – As required based on the condition of the roadway or conveyance system
Removal of sediments Small scale – at Catchbasins, Manholes structures and Conduits	Vacuum trucks, Shovel, wheelbarrow and/or similar equipment for transportation of materials	To maintain the capacity of the storm sewer system and to minimize the sediment transport	Non-Routine – Once the sediment a depth of 0.15m in the sumps or as required based on field inspection
Removal of sediments Large scale – SWM pond	Heavy machinery and transportation equipment	To maintain the quality control objective and to minimize sediment transport off site.	Non-Routine – Please refer to Appendix F

A site specific SWM inspection and maintenance manual in accordance with MCEP guidelines is recommended during the detailed design stage of the development to provide guidance on inspection and to provide detailed maintenance breakdown for the proposed SWM facilities at the site.

7.0 EROSION AND SEDIMENT CONTROL

During construction, when the soils are exposed, there is a greater chance for the sediment to be transported to the downstream areas even for a small rainfall event. Temporary Erosion and Sediment Control measures are recommended to minimize the sediment transport during the initial stages of the development. Following ESC measures are found to be suitable for the proposed development.

Silt Fence

Based on the nature of development, light duty silt fences are recommended as per OPSD 219.110. The silt fence should be installed before commencing any construction and should be inspected after every storm event. In the event that the silt fence is damaged or accumulated a significant amount of sediment, the affected portion should be replaced or cleaned for proper function.

Catchbasin Inlet Control Devices

Catchbasin inlet control structures include a filter which treats the runoff before it reaches the SWM facility. Filters must be inspected regularly and cleaned/replaced whenever necessary to ensure continuous treatment. The Catchbasin filters can be removed once the final layer of asphalt has been paved or the vegetation has been established to minimize the sediment transport.

Before construction begins, temporary silt fence will need to be installed as noted on the *Erosion and Sediment Control Plan*. Inlet sediment control devices complete with crushed stone filter should be installed at all specified locations. It is crucial that these controls be maintained throughout construction and inspection of sediment and erosion control will be facilitated by the Contractor or Contract Administration staff throughout the construction period.

The Contractor, at their discretion or at the instruction of the Town, MVCA or the Contract Administrator shall increase the quantity of sediment and erosion controls on-site to ensure that the site is operating as intended and no additional sediment finds its way into the storm sewer network on site. The silt fence shall be inspected weekly and after rainfall events. Care shall be taken to properly remove sediment as required.

As each lot is developed, proper sediment and erosion controls will need to be installed and maintained. Grass shall be established as soon as possible, and excess fill shall be removed or leveled promptly. All manholes, catchbasins and other drainage structures shall be covered in inlet sediment control device when installed.

8.0 RECOMMENDATION

Based on the information presented in this report, the preliminary assessment determined the proposed site can achieve adequate capacity for water, waste water, and storm servicing to accommodate the proposed development.

This report is submitted in support of the proposed Plan of Subdivision. We respectfully request the details of this report be approved.

Regards,

McIntosh Perry Consulting Engineers Ltd.

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Project Manager | Land Development
McIntosh Perry Consulting Engineers
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9.0 STATEMENT OF LIMITATIONS

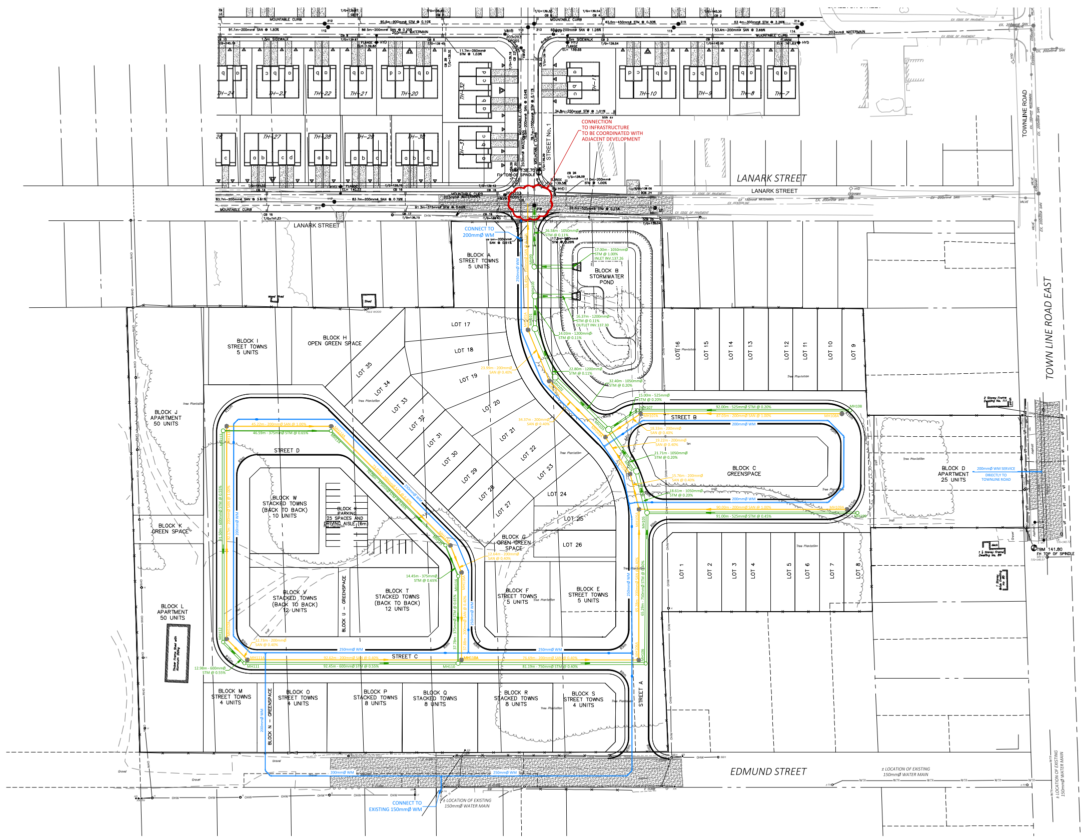
This report was produced for the exclusive use of Wintergreen Ridge Ltd. The purpose of the report is to assess the existing servicing and provide recommendations and designs for the post-construction scenario that are in compliance with the guidelines and standards from the Ministry of the Environment, Conservation and Parks, Town of Carleton Place and local approval agencies. McIntosh Perry reviewed the site information and background documents listed in Section 2.0 of this report. While the previous data was reviewed by McIntosh Perry and site visits were performed, no field verification/measures of any information were conducted.

Any use of this review by a third party, or any reliance on decisions made based on it, without a reliance report is the responsibility of such third parties. McIntosh Perry accepts no responsibility for damages, if any, suffered by any third party as a result of decisions or actions made based on this review.

The findings, conclusions and/or recommendations of this report are only valid as of the date of this report. No assurance is made regarding any changes in conditions subsequent to this date. If additional information is discovered or becomes available at a future date, McIntosh Perry should be requested to re-evaluate the conclusions presented in this report, and provide amendments, if required.

APPENDIX A
SERVICING AND GRADING PLAN

McINTOSH PERRY


LANARK STREET
CONNECTION
TO INFRASTRUCTURE
TO BE COORDINATED WITH
ADJACENT DEVELOPMENT
STREET No. 1
TOWNLINE ROAD
TOWN LINE ROAD EAST
CONNECT TO
200mmØ WM
BLOCK A
STREET TOWNS
5 UNITS
BLOCK B
STORMWATER
POND
BLOCK I
STREET TOWNS
5 UNITS
BLOCK H
OPEN GREEN SPACE
BLOCK J
APARTMENT
50 UNITS
BLOCK K
GREEN SPACE
BLOCK L
APARTMENT
50 UNITS
STREET D
BLOCK W
STACKED TOWNS
(BACK TO BACK)
10 UNITS
BLOCK X
PARKING
23 SPACES AND
DRIVING AISLE (6m)
BLOCK V
STACKED TOWNS
(BACK TO BACK)
12 UNITS
BLOCK U - GREENSPACE
BLOCK T
STACKED TOWNS
(BACK TO BACK)
12 UNITS
BLOCK G
OPEN GREEN
SPACE
BLOCK F
STREET TOWNS
5 UNITS
BLOCK E
STREET TOWNS
5 UNITS
STREET B
BLOCK C
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BLOCK D
APARTMENT
25 UNITS
STREET C
STREET A
BLOCK M
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4 UNITS
BLOCK N - GREENSPACE
BLOCK O
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4 UNITS
BLOCK P
STACKED TOWNS
8 UNITS
BLOCK Q
STACKED TOWNS
8 UNITS
BLOCK R
STACKED TOWNS
8 UNITS
BLOCK S
STREET TOWNS
4 UNITS
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EXISTING 150mmØ WM
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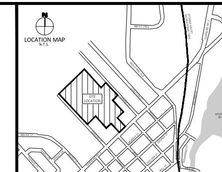

FOR REVIEW ONLY
NOT FOR CONSTRUCTION

SCALE 1 : 750
0 25 50 75 Metres

No.	Revision/Issue	Date
0	ISSUED FOR REVIEW	SEPT.14.2023

Check and verify all dimensions before proceeding with the work

Do not scale drawings

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North:

Stamp:

Client:
WINTERGREEN RIDGE LTD.

Project:
400 LANARK STREET
WINTERGREEN RIDGE SUBDIVISION

CARLETON PLACE ONTARIO

Drawing Title:
PRELIMINARY PLAN OF SERVICES

Scale: 1:750

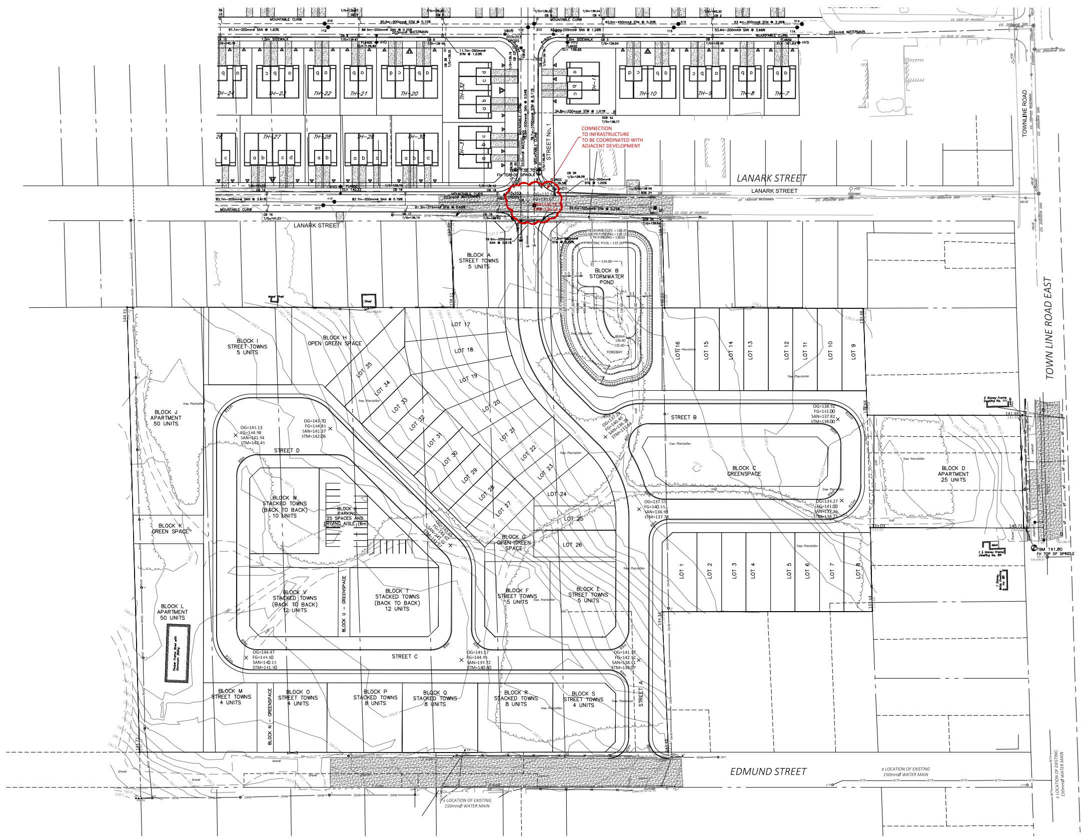
Project Number: CCO-22-0957

Drawn by:

Checked By:

Designed By:

Drawing Number: SRV



LANARK STREET
STREET No. 1
CONNECTION TO INFRASTRUCTURE TO BE COORDINATED WITH ADJACENT DEVELOPMENT
TOWNLINE ROAD
TOWN LINE ROAD EAST
BLOCK A STREET TOWNS 5 UNITS
BLOCK B STORMWATER POND
BLOCK C GREENSPACE
BLOCK D APARTMENT 25 UNITS
BLOCK E STREET TOWNS 5 UNITS
BLOCK F STREET TOWNS 5 UNITS
BLOCK G OPEN GREEN SPACE
BLOCK H OPEN GREEN SPACE
BLOCK I STREET TOWNS 5 UNITS
BLOCK J APARTMENT 50 UNITS
BLOCK K GREEN SPACE
BLOCK L APARTMENT 50 UNITS
BLOCK M STREET TOWNS 4 UNITS
BLOCK N - GREENSPACE
BLOCK O STREET TOWNS 4 UNITS
BLOCK P STACKED TOWNS 8 UNITS
BLOCK Q STACKED TOWNS 8 UNITS
BLOCK R STACKED TOWNS 8 UNITS
BLOCK S STREET TOWNS 4 UNITS
BLOCK T STACKED TOWNS (BACK TO BACK) 12 UNITS
BLOCK U - GREENSPACE
BLOCK V STACKED TOWNS (BACK TO BACK) 12 UNITS
BLOCK W STACKED TOWNS (BACK TO BACK) 10 UNITS
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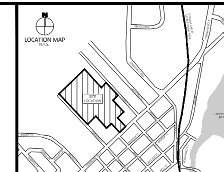
STREET B
STREET C
STREET D
EDMUND STREET



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SCALE 1 : 750
0 25 50 75 Metres

No.	Revision/Issue	Date
0	ISSUED FOR REVIEW	SEPT 14 2023

Check and verify all dimensions before proceeding with the work

Do not scale drawings

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North:

Stamp:

Client:
WINTERGREEN RIDGE LTD.

Project:
400 LANARK STREET
WINTERGREEN RIDGE SUBDIVISION

CARLETON PLACE ONTARIO

Drawing Title:
PRELIMINARY GRADING PLAN

Scale: 1:750

Project Number: CCO-22-0957

Drawn by:

Checked By:

Designed By:

Drawing Number: GRD

FILENAME: U:\Perth\MPCE JOBS\MPCE Projects\2022\CCO\CCO-22-0957 - Wintergreen - Draft Plan of Subdivision - 400 Lanark Street\05 - Drawings\CCO-22-0957 - 400 Lanark Street-Prelim Design.dwg
LAST SAVED: Thursday, September 14, 2023 LAST SAVED BY: s.hall
LAST PLOTTED: Thursday, September 14, 2023 CTB FILE USED: ----

APPENDIX B
PRE-CONSULTATION NOTES

McINTOSH PERRY

Pre-Consultation Meeting Notes
Virtual zoom meeting – October 13, 2022
Prepared By: Julie Stewart

In Attendance
Mike Sullivan – President, LandPro Planning Solutions
Marko Maric – Planner, LandPro Planning Solutions
Derek Crupi - owner
Joshua Smith – McIntosh Perry
Niki Dwyer – Director of Development Services, Town of Carleton Place
Joanne Henderson - Manager of Recreation and Culture, Town of Carleton Place
Diane Reid – Planner, MVCA
Terry McCann – Director of Public Works, County of Lanark
Julie Stewart – County Planner, County of Lanark

A pre-consultation meeting was held in 2021. The agents have requested a subsequent pre-consultation meeting to review revised concept plan.

Townline Road

Townline Road is a County Road and therefore the Director of Public Works for the County of Lanark will review and provide comment on the Traffic Study. The study should address intersections, requirements for turning lanes, road widenings, entrances, any modifications, etc.

The County had been contacted by an engineering firm in regards to a Traffic Study for the proposed Inverness development at Lanark and Carleton Street. Recommended that the agents for the proposed McGuire development reach out to Inverness to coordinate studies.

The County will also review and comment on the stormwater management report and plans.

Any proposed entrance to the apartment building off of Townline Road will also need to approvals from Lanark County Public Works Department.

The Town will also be involved in the review and comment of the TIS.

Town Planning comments – Niki Dwyer

Council is not favourable on five (5) blocks of townhouses. Want some variation of the number of units consecutively. Recommended that the blocks provide a mix of types of units.

Parking – the Town does not favour surface parking. If there is surface parking it should be away from the street.

Consultant and owner noted there is an opportunity for at grade parking.

Niki supports the open space at the entrance to the development and requested that consideration be given to carry the open space "corridor" through to Lanark Street, to provide harmony.

Recommended that the consultants connect with Inverness in regards to their proposed plans for Lanark and Carleton Street development.

Noted that a portion of Edmund Street is closed.

Recommended that a market analysis for condominiums versus rental apartments be provided.

Affordable Housing – a minimum of 20% will be required to be provided.
Discussion on overall density

- Proposed density is high
- May be reduced when the townhouse blocks are redesigned

MVCA
Diane Reid – advised no Natural Heritage or Natural Hazards on site. MVCA involvement will be limited to storm water management review.

Diane did ask where the outlet would be proposed.

Joshua noted may be at Lanark Street or onto Townline Road.

APPENDIX C
WATERMAIN CALCULATIONS

McINTOSH PERRY

WATER DEMAND CALCULATIONS

PROJECT: Coleman Central Subdivision - Phase 2
LOCATION: Carleton Place
CLIENT: Cavanagh Construction Ltd.

McINTOSH PERRY

LOCATION		INDIVIDUAL						FLOW									
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
STREET	JUNCTION	UNIT TYPES				AREA	POPULATION	PEAKING FACTORS		AVERAGE DAY FLOW Q(a)		MAX DAY FLOW Q(max)		PEAK HOURLY FLOW Q(h)		FIRE FLOW (FUS)	
		SF	SD	TH	APT	(ha)		MAX DAY	PEAK HOUR	(L/s)	(L/min)	(L/s)	(L/min)	(L/s)	(L/min)	(L/s)	(L/min)
400 Lanark																	
	J-1	2		5			20.3	2.75	4.13	0.08	4.93	0.23	13.57	0.34	20.38	250.00	15,000
	J-2	8					27.2	2.75	4.13	0.11	6.61	0.30	18.18	0.46	27.30	250.00	15,000
	J-3	6					20.4	2.75	4.13	0.08	4.96	0.23	13.64	0.34	20.48	250.00	15,000
	J-4			22			59.4	2.75	4.13	0.24	14.44	0.66	39.70	0.99	59.63	250.00	15,000
	J-5	6		28			96.0	2.75	4.13	0.39	23.33	1.07	64.17	1.61	96.37	250.00	15,000
	J-6	3		5	50		113.7	2.75	4.13	0.46	27.64	1.27	76.00	1.90	114.13	250.00	15,000
	J-7			20	50		144.0	2.75	4.13	0.58	35.00	1.60	96.25	2.41	144.55	250.00	15,000
	J-8	5			25		62.0	2.75	4.13	0.25	15.07	0.69	41.44	1.04	62.24	250.00	15,000
	J-9	5					17.0	2.75	4.13	0.07	4.13	0.19	11.36	0.28	17.06	250.00	15,000
TOTALS		35	0	80	125	0	560.0			2.27	136.11	6.24	374.31	9.37	562.14		

Design Parameters:

Single Family	3.4	p/p/u
TH/SD	2.7	p/p/u
Average Apartment	1.8	p/p/u

Notes:

1. Domestic Flow: 350 L/(cap·day)

Q (a) = Average Daily Flow
Q (max) = Maximum Daily Flow — Q (max) = Q(a) * Peaking Factor
Q (h) = Peak Hour Flow — Q (h) = Q(a) * Peaking Factor
Q (min) = Night Minimum Hour Flow — Q (min) = Q(a) * Peaking Factor

REFERENCE: CITY OF OTTAWA - WATER DISTRIBUTION GUIDELINES, JULY 2010
MOE - DESIGN GUIDELINES FOR DRINKING-WATER SYSTEMS 2008

Designed: LG

Checked:

Project No.: CCO-22-0957

McINTOSH PERRY

Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 2020

Building No. / Type: Single Family

An estimate of the Fire Flow required for a given fire area may be estimated by:

RFF = 220 x C x √A Where:

F = Required fire flow in liters per minute

C = Coefficient related to the type of construction.

A = The total floor area in square meters (including all storey's, but excluding basements at least 50 percent below grade) in the building being considered.

A. Determine the Construction Coefficient (C)

Choose the construction type and coefficient to be used in the required fire flow formula:

C = 1.5	**Type V** Wood Frame Construction
= 0.8	**Type IV-A** Mass Timber Construction
= 0.9	**Type IV-B** Mass Timber Construction
= 1.0	**Type IV-C** Mass Timber Construction
= 1.5	**Type IV-D** Mass Timber Construction
= 1.0	**Type III** Ordinary Construction
= 0.8	**Type II** Noncombustible Construction
= 0.6	**Type I** Fire Resistive Construction

Input: C = Type V Wood Frame Construction = 1.5

B. Determine Total Effective Floor Area (A)

Input building floor areas:

Floor No.		Area (m^2)	% Used	Area Used (m^2)	Total (m^2)
2	=	200	100%	200	400
1	=	200	100%	200	
B1	=	200	0%	0	
		Input:			

C. Determine Required Fire Flow

RFF = **220 x C x √A** = 6600 L/min

= **7000 L/min** *(Rounded to nearest 1,000 L/min)*

D. Determine Increase or Decrease Based on Occupancy Contents Adjustment Factor

Choose the combusitbility of building contents:

Option		Input:	Factor	Fire Flow Change	Adjusted RFF
Non-Combustible	-25%				
Limited Combustible	-15%	**Limited Combustible**	**-15%**	**-1050 L/min**	**5950 L/min**
Combustible	0%				
Free Burning	15%				
Rapid Burning	25%				

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Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 2020

Building No. / Type: **Single Family**

E. Determine the Decrease for Automatic Sprinkler Protection, if Applicable

Choose the sprinkler options that apply:

Option		Applicable?	Factor	Fire Flow Change	Adjusted RFF
Automatic sprinkler conforms to NFPA 13	-30%	No	0%	0 L/min	5950 L/min
Standard water supply for system and Fire Department hose line	-10%	No	0%	0 L/min	5950 L/min
Fully supervised system	-10%	No	0%	0 L/min	5950 L/min

F. Determine the Total Increase for Exposures

Choose separation distance and wall lengths:

Subject Side	Separation Distance (m)	Exposed Wall Type	Wall Length (m)	No. of Storeys	Length-Height Factor	Charge (%) (See FUS-Table 6)	Total Charge (%)	Fire Flow Change (L/min)	Adjusted RFF (L/min)
North	4.5	Type V	18	2	36	11%	44%	2618	8568
South	4.5	Type V	18	2	36	11%			
East	10.3	Type V	12	2	24	11%			
West	36.5	Type V	12	2	24	11%			
			Input:						

G. Determine the Total Required Fire Flow

Total Required Fire Flow, Rounded to the Nearest 1,000 L/min =	9000 L/min
Total Required Fire Flow (L/sec) =	150 L/sec
Does the 10,000 L/min (167 L/sec) RFF limit apply, based on "TECHNICAL BULLITEN ISTB-2018-02"? =	No
Resultant Total Required Fire Flow (L/sec) =	**150 L/sec**

McINTOSH PERRY

Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 2020

Building No. / Type: Townhome

An estimate of the Fire Flow required for a given fire area may be estimated by:

RFF = 220 x C x √A Where:

F = Required fire flow in liters per minute
C = Coefficient related to the type of construction.
A = The total floor area in square meters (including all storey's, but excluding basements at least 50 percent below grade) in the building being considered.

A. Determine the Construction Coefficient (C)

Choose the construction type and coefficient to be used in the required fire flow formula:

C = 1.5	**Type V** Wood Frame Construction	
= 0.8	**Type IV-A** Mass Timber Construction	
= 0.9	**Type IV-B** Mass Timber Construction	
= 1.0	**Type IV-C** Mass Timber Construction	
= 1.5	**Type IV-D** Mass Timber Construction	
= 1.0	**Type III** Ordinary Construction	
= 0.8	**Type II** Noncombustible Construction	
= 0.6	**Type I** Fire Resistive Construction	

Input: C = Type V Wood Frame Construction = 1.5

B. Determine Total Effective Floor Area (A)

Input building floor areas:

Floor No.		Area (m^2)	% Used	Area Used (m^2)	Total (m^2)
2	=	535	100%	535	
1	=	535	100%	535	1070
B1	=	535	0%	0	
		Input:			

C. Determine Required Fire Flow

RFF = **220 x C x √A** = 10795 L/min
= **11000 L/min** *(Rounded to nearest 1,000 L/min)*

D. Determine Increase or Decrease Based on Occupancy Contents Adjustment Factor

Choose the combusitbility of building contents:

Option		Input:	Factor	Fire Flow Change	Adjusted RFF
Non-Combustible	-25%				
Limited Combustible	-15%	**Limited Combustible**	**-15%**	**-1650 L/min**	**9350 L/min**
Combustible	0%				
Free Burning	15%				
Rapid Burning	25%				

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Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 2020

Building No. / Type: **Townhome**

E. Determine the Decrease for Automatic Sprinkler Protection, if Applicable

Choose the sprinkler options that apply:

Option		Applicable?	Factor	Fire Flow Change	Adjusted RFF
Automatic sprinkler conforms to NFPA 13	-30%	No	0%	0 L/min	9350 L/min
Standard water supply for system and Fire Department hose line	-10%	No	0%	0 L/min	9350 L/min
Fully supervised system	-10%	No	0%	0 L/min	9350 L/min

F. Determine the Total Increase for Exposures

Choose separation distance and wall lengths:

Subject Side	Separation Distance (m)	Exposed Wall Type	Wall Length (m)	No. of Storeys	Length-Height Factor	Charge (%) (See FUS-Table 6)	Total Charge (%)	Fire Flow Change (L/min)	Adjusted RFF (L/min)
North East	9	Type V	21	2	42	16%	32%	2992	12342
Sout West	22	Type V	21	2	42	4%			
North West	15	Type V	26	2	52	12%			
South East	32	Type V	11	2	22	0%			
			Input:						

G. Determine the Total Required Fire Flow

Total Required Fire Flow, Rounded to the Nearest 1,000 L/min =	12000 L/min
Total Required Fire Flow (L/sec) =	200 L/sec
Does the 10,000 L/min (167 L/sec) RFF limit apply, based on "TECHNICAL BULLITEN ISTB-2018-02"? =	No
Resultant Total Required Fire Flow (L/sec) =	**200 L/sec**

McINTOSH PERRY

Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 2020

Building No. / Type: Townhome

An estimate of the Fire Flow required for a given fire area may be estimated by:

RFF = 220 x C x √A Where:

F = Required fire flow in liters per minute
C = Coefficient related to the type of construction.
A = The total floor area in square meters (including all storey's, but excluding basements at least 50 percent below grade) in the building being considered.

A. Determine the Construction Coefficient (C)

Choose the construction type and coefficient to be used in the required fire flow formula:

C = 1.5	**Type V** Wood Frame Construction	
= 0.8	**Type IV-A** Mass Timber Construction	
= 0.9	**Type IV-B** Mass Timber Construction	
= 1.0	**Type IV-C** Mass Timber Construction	
= 1.5	**Type IV-D** Mass Timber Construction	
= 1.0	**Type III** Ordinary Construction	
= 0.8	**Type II** Noncombustible Construction	
= 0.6	**Type I** Fire Resistive Construction	

Input: C = Type V Wood Frame Construction = 1.5

B. Determine Total Effective Floor Area (A)

Input building floor areas:

Floor No.		Area (m^2)	% Used	Area Used (m^2)	Total (m^2)
2	=	1500	100%	1500	4500
2	=	1500	100%	1500	
1	=	1500	100%	1500	
B1	=	1500	0%	0	
		Input:			

C. Determine Required Fire Flow

RFF = **220 x C x √A** = 22137 L/min
= **22000 L/min** *(Rounded to nearest 1,000 L/min)*

D. Determine Increase or Decrease Based on Occupancy Contents Adjustment Factor

Choose the combusitbility of building contents:

Option		Input:	Factor	Fire Flow Change	Adjusted RFF
Non-Combustible	-25%				
Limited Combustible	-15%	**Limited Combustible**	**-15%**	**-3300 L/min**	**18700 L/min**
Combustible	0%				
Free Burning	15%				
Rapid Burning	25%				

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Fire Flow Requirements Based on Fire Underwriters Survey (FUS) 2020

Building No. / Type: **Townhome**

E. Determine the Decrease for Automatic Sprinkler Protection, if Applicable

Choose the sprinkler options that apply:

Option		Applicable?	Factor	Fire Flow Change	Adjusted RFF
Automatic sprinkler conforms to NFPA 13	-30%	Yes	-30%	-5610 L/min	13090 L/min
Standard water supply for system and Fire Department hose line	-10%	No	0%	0 L/min	13090 L/min
Fully supervised system	-10%	No	0%	0 L/min	13090 L/min

F. Determine the Total Increase for Exposures

Choose separation distance and wall lengths:

Subject Side	Separation Distance (m)	Exposed Wall Type	Wall Length (m)	No. of Storeys	Length-Height Factor	Charge (%) (See FUS-Table 6)	Total Charge (%)	Fire Flow Change (L/min)	Adjusted RFF (L/min)
North East	30	Type V	21	3	63	0%	15%	1964	15054
Sout West	0	Type V	0	0	0	0%			
North West	0	Type V	0	0	0	0%			
South East	6	Type V	12	2	24	15%			
			Input:						

G. Determine the Total Required Fire Flow

Total Required Fire Flow, Rounded to the Nearest 1,000 L/min =	15000 L/min
Total Required Fire Flow (L/sec) =	250 L/sec
Does the 10,000 L/min (167 L/sec) RFF limit apply, based on "TECHNICAL BULLITEN ISTB-2018-02"? =	No
Resultant Total Required Fire Flow (L/sec) =	**250 L/sec**

400 Lanark Water Model

Average Day Demands

Junction Table - Time: 0.00 hours

ID	Label	Elevation (m)	Zone	Demand Collection	Demand (L/s)	Hydraulic Grade (m)	Pressure (psi)
35	J-1	140.54	<None>	<Collection: 1 item>	0.08	183.14	60
37	J-2	140.50	<None>	<Collection: 1 item>	0.11	183.07	60
39	J-3	140.68	<None>	<Collection: 1 item>	0.08	183.05	60
41	J-4	142.92	<None>	<Collection: 1 item>	0.24	182.97	57
43	J-5	144.95	<None>	<Collection: 1 item>	0.39	182.95	54
45	J-6	144.85	<None>	<Collection: 1 item>	0.46	182.94	54
47	J-7	144.50	<None>	<Collection: 1 item>	0.58	182.94	55
50	J-8	141.00	<None>	<Collection: 1 item>	0.25	183.06	60
52	J-9	140.95	<None>	<Collection: 1 item>	0.07	183.06	60
55	J-10	144.32	<None>	<Collection: 0 items>	0.00	182.95	55
69	J-11	143.32	<None>	<Collection: 0 items>	0.00	182.86	56
93	J-19	143.32	<None>	<Collection: 0 items>	0.00	182.90	260
95	J-20	144.56	<None>	<Collection: 0 items>	0.00	182.94	54

Reservoir Table - Time: 0.00 hours

ID	Label	Elevation (m)	Zone	Flow (Out net) (L/s)	Hydraulic Grade (m)

400 Lanark Water Model

Average Day Demands

Reservoir Table - Time: 0.00 hours

ID	Label	Elevation (m)	Zone	Flow (Out net) (L/s)	Hydraulic Grade (m)
34	R-1 (ExJ5)	183.20	<None>	22.02	183.20
73	R-2 (J-135)	182.03	<None>	-19.76	182.03

400 Lanark Water Model

Peak Hour Demands

Junction Table - Time: 0.00 hours

ID	Label	Elevation (m)	Zone	Demand Collection	Demand (L/s)	Hydraulic Grade (m)	Pressure (psi)
35	J-1	140.54	<None>	<Collection: 1 item>	0.34	180.60	57
37	J-2	140.50	<None>	<Collection: 1 item>	1.90	180.52	57
39	J-3	140.68	<None>	<Collection: 1 item>	0.34	180.50	57
41	J-4	142.92	<None>	<Collection: 1 item>	0.99	180.45	53
43	J-5	144.95	<None>	<Collection: 1 item>	1.61	180.43	50
45	J-6	144.85	<None>	<Collection: 1 item>	1.90	180.42	50
47	J-7	144.50	<None>	<Collection: 1 item>	2.41	180.42	51
50	J-8	141.00	<None>	<Collection: 1 item>	1.04	180.51	56
52	J-9	140.95	<None>	<Collection: 1 item>	0.28	180.51	56
55	J-10	144.32	<None>	<Collection: 0 items>	0.00	180.43	51
69	J-11	143.32	<None>	<Collection: 0 items>	0.00	180.41	53
93	J-19	143.32	<None>	<Collection: 0 items>	0.00	180.42	256
95	J-20	144.56	<None>	<Collection: 0 items>	0.00	180.42	51

Reservoir Table - Time: 0.00 hours

ID	Label	Elevation (m)	Zone	Flow (Out net) (L/s)	Hydraulic Grade (m)

400 Lanark Water Model

Peak Hour Demands

Reservoir Table - Time: 0.00 hours

ID	Label	Elevation (m)	Zone	Flow (Out net) (L/s)	Hydraulic Grade (m)
34	R-1 (ExJ5)	180.66	<None>	22.78	180.66
73	R-2 (J-135)	180.02	<None>	-11.97	180.02

400 Lanark Water Model

Max Day + Fire Flow, Reduced HGL (Min. 167L/sec)

Fire Flow Results Table - Time: 0.00 hours

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow Status	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)
J-1	<None>	True	1	0.00	350.00
J-2	<None>	True	1	0.00	350.00
J-3	<None>	True	1	0.00	350.00
J-4	<None>	True	1	0.00	350.00
J-5	<None>	True	1	0.00	295.67
J-6	<None>	True	1	0.00	260.18
J-7	<None>	True	1	0.00	268.13
J-8	<None>	True	1	0.00	260.80
J-9	<None>	False	6	0.00	242.97
J-10	<None>	True	1	0.00	323.49
J-11	<None>	True	1	0.00	327.13
J-19	<None>	True	1	0.00	307.38
J-20	<None>	True	1	0.00	276.47

Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual) (psi)	Pressure (Zone Lower Limit) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Junction w/ Minimum Pressure (Zone)
250.23	350.23	0	47	0	41	J-5
250.30	350.30	0	36	0	32	J-5
250.23	350.23	0	33	0	28	J-5
250.66	350.66	0	23	0	20	J-5
251.07	296.74	0	20	0	21	J-6
251.27	261.45	0	20	0	25	J-7
251.60	269.73	0	20	0	23	J-20
250.69	261.49	0	20	0	22	J-9
250.19	243.16	0	20	0	27	J-8
250.00	323.49	0	20	0	25	J-5
250.00	327.13	0	20	0	24	J-10
250.00	307.38	0	216	0	20	J-20
250.00	276.47	0	20	0	21	J-7

Pressure (System Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)	Junction w/ Minimum Pressure (System)	Is Fire Flow Run Balanced?
0	41	J-5	True
0	32	J-5	True
0	28	J-5	True
0	20	J-5	True
0	21	J-6	True
0	25	J-7	True
0	23	J-20	True
0	22	J-9	True
0	27	J-8	True

400 Lanark Water Model

Max Day + Fire Flow, Reduced HGL (Min. 167L/sec)

Fire Flow Results Table - Time: 0.00 hours

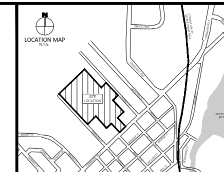
Pressure (System Lower Limit) (psi)	Pressure (Calculated System Lower Limit) (psi)	Junction w/ Minimum Pressure (System)	Is Fire Flow Run Balanced?
0	25	J-5	True
0	24	J-10	True
0	20	J-20	True
0	21	J-7	True

Reservoir Table - Time: 0.00 hours

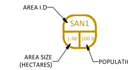
ID	Label	Elevation (m)	Zone	Flow (Out net) (L/s)	Hydraulic Grade (m)
34	R-1 (ExJ5)	180.66	<None>	19.01	180.66
73	R-2 (J-135)	180.02	<None>	-12.77	180.02

APPENDIX D
SANITARY CALCULATIONS

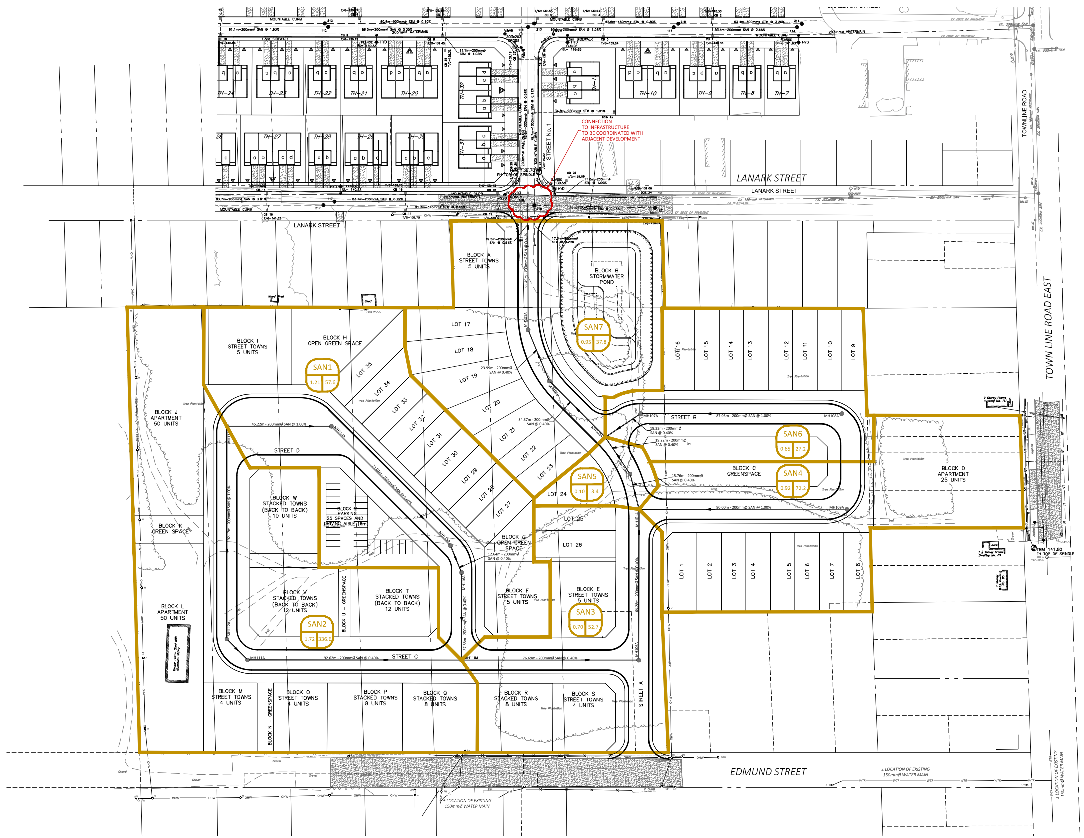
McINTOSH PERRY



LEGEND



FOR REVIEW ONLY
NOT FOR CONSTRUCTION


LANARK STREET
STREET No. 1
CONNECTION TO INFRASTRUCTURE TO BE COORDINATED WITH ADJACENT DEVELOPMENT
TOWNLINE ROAD
TOWN LINE ROAD EAST
EDMUND STREET
BLOCK A STREET TOWNS 5 UNITS
BLOCK B STORMWATER POND
BLOCK C GREENSPACE
BLOCK D APARTMENT 25 UNITS
BLOCK E STREET TOWNS 5 UNITS
BLOCK F STREET TOWNS 5 UNITS
BLOCK G OPEN GREEN SPACE
BLOCK H OPEN GREEN SPACE
BLOCK I STREET TOWNS 5 UNITS
BLOCK J APARTMENT 50 UNITS
BLOCK K GREEN SPACE
BLOCK L APARTMENT 50 UNITS
BLOCK M STREET TOWNS 4 UNITS
BLOCK N - GREENSPACE
BLOCK O STREET TOWNS 4 UNITS
BLOCK P STACKED TOWNS 8 UNITS
BLOCK Q STACKED TOWNS 8 UNITS
BLOCK R STACKED TOWNS 8 UNITS
BLOCK S STREET TOWNS 4 UNITS
BLOCK T STACKED TOWNS (BACK TO BACK) 12 UNITS
BLOCK U - GREENSPACE
BLOCK V STACKED TOWNS (BACK TO BACK) 12 UNITS
BLOCK W STACKED TOWNS (BACK TO BACK) 10 UNITS
BLOCK X PARKING 25 SPACES AND DRIVING AISLE (6m)
STREET A
STREET B
STREET C
STREET D
SAN1 1.21 57.6
SAN2 1.72 336.6
SAN3 0.70 52.7
SAN4 0.92 72.2
SAN5 0.10 3.4
SAN6 0.65 27.2
SAN7 0.95 37.8

SCALE 1 : 750
0 25 50 75 Metres

No.	Revision/Issue	Date
0	ISSUED FOR REVIEW	SEPT.14.2023

Check and verify all dimensions before proceeding with the work

Do not scale drawings

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North:

Stamp:

Client:
WINTERGREEN RIDGE LTD.

Project:
400 LANARK STREET
WINTERGREEN RIDGE SUBDIVISION

CARLETON PLACE ONTARIO

Drawing Title:
PRELIMINARY SANITARY SERVICING PLAN

Scale: 1:750

Drawn by:

Checked By:

Designed By:

Project Number: CCO-22-0957

Drawing Number: SAN

SANITARY SEWER DESIGN SHEET

PROJECT: Wintergreen Ridge Subdivision
LOCATION: Carleton Place
CLIENT: Wintergreen Ridge Ltd.

McINTOSH PERRY

LOCATION				RESIDENTIAL										ICI AREAS							INFILTRATION ALLOWANCE			FLOW	SEWER DATA					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	31	32
STREET	AREA ID	FROM MH	TO MH	UNIT TYPES					AREA	POPULATION		PEAK FACTOR	PEAK FLOW (L/s)	AREA (ha)						PEAK FLOW (L/s)	AREA (ha)		FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	DIA (mm)	SLOPE (%)	AVAILABLE CAPACITY	
				SF	SD	TH	APT	1BD APT	(ha)	IND	CUM			INSTITUTIONAL		COMMERCIAL		INDUSTRIAL			IND	CUM							L/s	(%)
														IND	CUM	IND	CUM	IND	CUM											
	SAN1	113A	110A	9	0	10	0	0	1.21	57.6	57.6	3.64	0.68			0.00	0.00			0.00	1.21	1.21	0.40	1.08	21.64	165.00	200	0.40	20.56	95.01
	SAN2	113A	110A	0	0	58	100	0	1.72	336.6	336.6	3.45	3.76			0.00	0.00			0.00	1.72	1.72	0.57	4.33	21.64	190.00	200	0.40	17.31	80.01
	SAN3	110A	105A	2	0	17	0	0	0.70	52.7	446.9	3.40	4.92			0.00	0.00			0.00	0.70	3.63	1.20	6.12	21.64	142.00	200	0.40	15.52	71.72
	SAN4	109A	105A	8	0	0	25	0	0.92	72.2	72.2	3.62	0.85			0.00	0.00			0.00	0.92	0.92	0.30	1.15	34.22	90.00	200	1.00	33.07	96.64
	SAN5	105A	103A	1	0	0	0	0	0.10	3.4	522.5	3.37	5.71			0.00	0.00			0.00	0.10	4.65	1.54	7.24	21.64	36.00	200	0.40	14.40	66.52
	SAN6	108A	103A	8	0	0	0	0	0.65	27.2	27.2	3.69	0.33			0.00	0.00			0.00	0.65	0.65	0.21	0.54	34.22	87.00	200	1.00	33.68	98.42
	SAN7	103A	MH-EX1A	7	0	5	0	0	0.95	37.3	587.0	3.35	6.37			0.00	0.00			0.00	0.95	6.26	2.06	8.44	21.64	114.00	200	0.40	13.20	61.01

Design Parameters:

Residential		ICI Areas			Peak Factor
SF	3.4				
TH/SD	2.7	INST	28,000	L/Ha/day	1.5
APT	1.8	COM	28,000	L/Ha/day	1.5
1BD APT	1.4	IND	35,000	L/Ha/day	1.5
Other	60				

Notes:
1. Mannings coefficient (n) = 0.013
2. Demand (per capita): 280 L/day
3. Infiltration allowance: 0.33 L/s/Ha
4. Residential Peaking Factor:
Harmon Formula = 1+(14/(4+P^0.5)*1)
where P = population in thousands

Designed: SH

Checked: PK

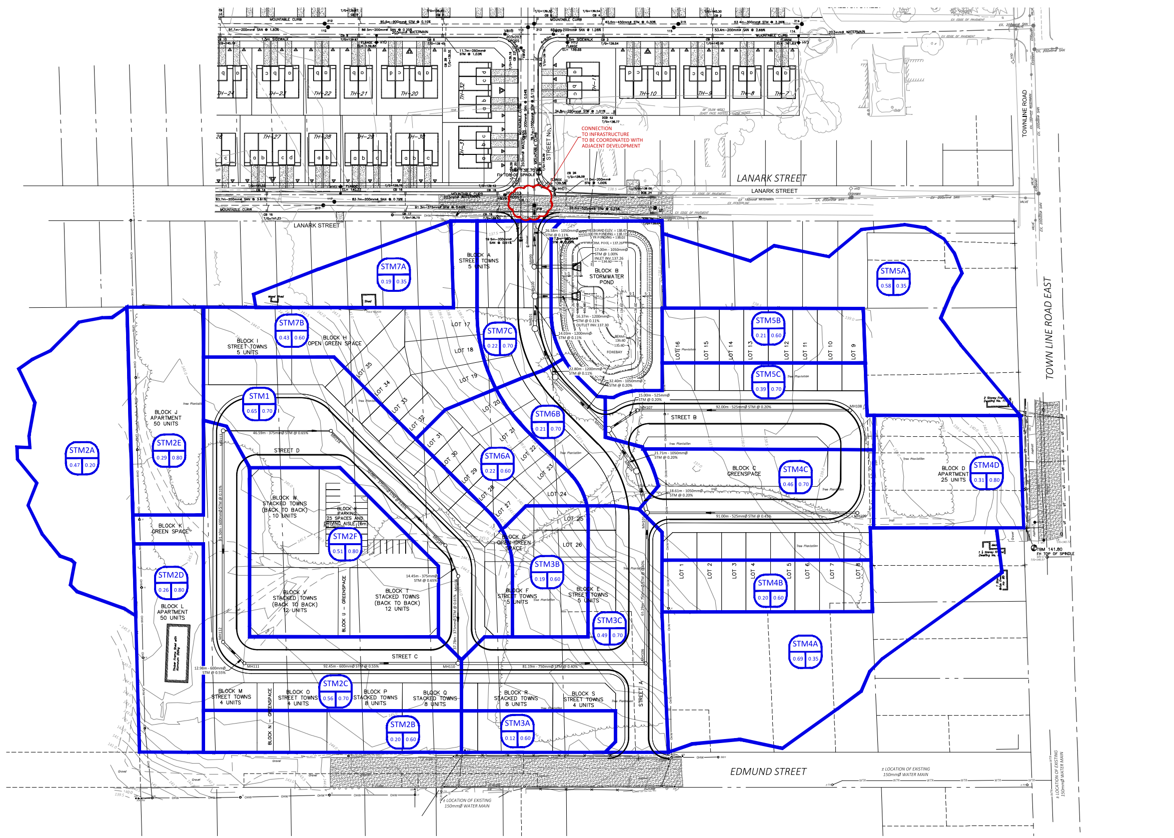
Project No.: CCO-22-0957

No.	Revision	Date
1	Issued For Review	Sept.11.2023

Sheet No: 1 of 1

APPENDIX E
POST-DEVELOPMENT DRAINAGE PLAN

McINTOSH PERRY



LANARK STREET
EDMUND STREET
TOWN LINE ROAD EAST
TOWNLINE ROAD
STREET No. 1
STREET A
STREET B
STREET C
STREET D
CONNECTION TO INFRASTRUCTURE TO BE COORDINATED WITH ADJACENT DEVELOPMENT
BLOCK B STORMWATER POND
BLOCK A STREET TOWNS 5 UNITS
BLOCK C GREENSPACE
BLOCK D APARTMENT 25 UNITS
BLOCK E STREET TOWNS 5 UNITS
BLOCK F STREET TOWNS 5 UNITS
BLOCK G OPEN GREEN SPACE
BLOCK H OPEN GREEN SPACE
BLOCK I STREET TOWNS 5 UNITS
BLOCK J APARTMENT 50 UNITS
BLOCK K GREEN SPACE
BLOCK L APARTMENT 50 UNITS
BLOCK M STREET TOWNS 4 UNITS
BLOCK N - GREENSPACE
BLOCK O STREET TOWNS 4 UNITS
BLOCK P STACKED TOWNS 8 UNITS
BLOCK Q STACKED TOWNS 8 UNITS
BLOCK R STACKED TOWNS 8 UNITS
BLOCK S STREET TOWNS 4 UNITS
BLOCK T STACKED TOWNS (BACK TO BACK) 12 UNITS
BLOCK U - GREENSPACE
BLOCK V STACKED TOWNS (BACK TO BACK) 12 UNITS
BLOCK W STACKED TOWNS (BACK TO BACK) 10 UNITS
BLOCK X PARKING 25 SPACES AND DRIVING AISLE (6m)
STM1 0.65 0.70
STM2A 0.47 0.20
STM2B 0.20 0.60
STM2C 0.56 0.70
STM2D 0.26 0.80
STM2E 0.29 0.80
STM2F 0.51 0.80
STM3A 0.12 0.60
STM3B 0.19 0.60
STM3C 0.49 0.70
STM4A 0.69 0.35
STM4B 0.20 0.60
STM4C 0.46 0.70
STM4D 0.31 0.80
STM5A 0.58 0.35
STM5B 0.21 0.60
STM5C 0.39 0.70
STM6A 0.22 0.60
STM6B 0.21 0.70
STM7A 0.19 0.35
STM7B 0.43 0.60
STM7C 0.22 0.70

LOCATION MAP
N.T.S.

LEGEND

AREA I.D.
STM1
1.00 0.50
AREA SIZE (HECTARES)
RUNOFF COEFFICIENT

FOR REVIEW ONLY
NOT FOR CONSTRUCTION

SCALE 1 : 750
0 25 50 75 Metres

No.	Revision/Issue	Date
0	ISSUED FOR REVIEW	SEPT 14 2023

Check and verify all dimensions before proceeding with the work

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Project:
400 LANARK STREET
WINTERGREEN RIDGE SUBDIVISION
CARLETON PLACE ONTARIO

Drawing Title:
PRELIMINARY STORM SERVICING PLAN

Scale: 1:750
Project Number: CCO-22-0957
Drawn by:
Checked By:
Designed By:
Drawing Number: STM

APPENDIX F
STORM CALCULATIONS

McINTOSH PERRY

STORM SEWER DESIGN SHEET

McINTOSH PERRY

PROJECT: Wintergreen Ridge Subdivision
LOCATION: Carleton Place
CLIENT: Wintergreen Ridge Ltd.

VACANT EX RY PR RY FY APT POND

LOCATION				CONTRIBUTING AREA (ha)								RATIONAL DESIGN FLOW										SEWER DATA								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
STREET	AREA ID	FROM MH	TO MH	C-VALUE 0.20	0.35	0.60	0.70	0.80	1.00	INDIV AC	CUMUL AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm) DIA	W	H	SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (5yr) (L/s)	(%)
	STM1	MH113	MH110				0.65			0.46	0.46	10.00	2.18	12.18	104.19	122.14	178.56	131.79				131.79	147.47	169.00	375			0.65	1.293	15.67	10.63%
	STM2	MH113	MH110	0.47		0.20	0.56	1.06		1.45	1.45	10.00	2.02	12.02	104.19	122.14	178.56	421.16				421.16	475.05	197.00	600			0.55	1.628	53.89	11.34%
	STM3	MH110	MH105			0.31	0.49			0.53	2.44	12.18	1.52	12.18	93.94	110.07	160.83	636.72				636.72	734.54	147.00	750			0.40	1.611	97.82	13.32%
	STM4	MH109	MH105		0.69	0.20	0.46	0.31		0.93	0.93	10.00	1.13	11.13	104.19	122.14	178.56	269.82				269.82	300.97	91.00	525			0.45	1.347	31.15	10.35%
	STM5	MH108	MH103		0.58	0.21	0.39			0.60	0.60	10.00	1.99	11.99	104.19	122.14	178.56	174.37				174.37	200.65	107.00	525			0.20	0.898	26.27	13.09%
	STM6	MH105	MH102			0.22	0.21			0.28	4.25	12.18	0.85	13.03	93.94	110.07	160.83	1,110.08				1,110.08	1,274.02	73.00	1050			0.20	1.425	163.94	12.87%
	STM7	MH103	POND		0.19	0.43	0.22			0.48	4.73	13.03	0.79	13.82	90.51	106.03	154.90	1,189.89				1,189.89	1,348.97	55.00	1200			0.11	1.155	159.08	11.79%

Definitions:
Q = 2.78CiA, where:
Q = Peak Flow in Litres per Second (L/s)
A = Area in Hectares (ha)
i = Rainfall intensity in millimeters per hour (mm/hr)
[i = 998.071 / (TC+6.053)^0.814] 5 YEAR
[i = 1174.184 / (TC+6.014)^0.816] 10 YEAR
[i = 1735.688 / (TC+6.014)^0.820] 100 YEAR

Notes:
1. Mannings coefficient (n) = 0.013

Designed: SH

Checked: PK

Project No.: CCO-22-0957

No.	Revision	Date
1.	ISSUED FOR REVIEW	Sept.11.2023

Sheet No: 1 of 1