WINTERGREEN RIDGE SUBDIVISION

Project No.: CCO-22-0957

Prepared for:

Wintergreen Ridge Ltd.

Prepared by:

EGIS Canada Inc.

115 Walgreen Road
Carp, ON K0A 1L0

October 2024

egis

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1.0 PROJECT DESCRIPTION

1.1 Purpose

Egis has been retained by Wintergreen Ridge Ltd. to prepare this Servicing Report in support of the Draft Plan of Subdivision process for the proposed 400 Lanark Subdivision, located in the Town of Carleton Place, Ontario.

The main purpose of this report is to present a conceptual servicing and grading 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 conceptual drawings:

- CCO-22-0957 – Servicing Plan
- CCO-22-0957 – Grading Plan
- CCO-22-0957 – Sanitary Drainage Area Plan
- CCO-22-0957 – Storm Drainage Area Plan

1.2 Site Description

The property is legally described as Lots 17, 20, 23, 26, 29 & 32, and Part of Lots 4 and 12, Registered Plan No. 787 (also known as Registered Plan No. 970), and Lots 89, 90, 91, 92, 93 & 94, Registered Plan No. 3469, Formerly in the Geographic Township of Ramsay, Town of Carleton Place, County of Lanark. 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 6.26ha.

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

The total unit breakdown of the proposed subdivision can be found in the table below. 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.

Table 1: Unit Breakdown

Single Family Units	23
Semi-Detached Units	20
Street Townhouse Units	23
Back-to-back Townhouse Units	53

Apartment Units	82

2.0 BACKROUND INFORMATION

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 Plan 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 Residential Subdivision, Servicing and Stormwater Management Report– Robinson Consultants Inc. (Revised April 2024).
- Phase I Environmental Site Assessment – Watter Environmental Group (June. 2021).
- Scope Environmental Impact Statement and Tree Preservation Plan – Egis (August. 2024)

2.1 Applicable Guidelines and Standards

City of Ottawa:

- Ottawa Sewer Design Guidelines, City of Ottawa, SDG002, October 2012. **(*Ottawa Sewer Guidelines*)**
  - Technical Bulletin ISTB-2014-01 City of Ottawa, February 2014**. *(ISTB-2014-01)***
  - Technical Bulletin ISTB-2018-01 City of Ottawa, January 2018**. *(ISTB-2018-01)***
  - Technical Bulletin ISTB-2018-03 City of Ottawa, March 2018. ***(ISTB-2018-03)***
  - Technical Bulletin ISTB-2019-01 City of Ottawa, January 2019. ***(ISTB-2019-01)***
  - Technical Bulletin ISTB-2019-02 City of Ottawa, February 2019. ***(ISTB-2019-02)***
- Ottawa Design Guidelines – Water Distribution City of Ottawa, July 2010. **(*Ottawa Water Guidelines*)**
  - Technical Bulletin ISD-2010-2 City of Ottawa, December 15, 2010. ***(ISD-2010-2)***
  - Technical Bulletin ISDTB-2014-02 City of Ottawa, May 2014. **(ISDTB-2014-02)**
  - Technical Bulletin ISTB-2018-02 City of Ottawa, March 2018. ***(ISTB-2018-02)***
  - Technical Bulletin ISTB-2021-03 City of Ottawa, August 2021. ***(ISTB-2021-03)***

Ministry of Environment, Conservation and Parks:

- Stormwater Planning and Design Manual, Ministry of the Environment, March 2003. ***(MECP Stormwater Design Manual)***
- Design Guidelines for Sewage Works, Ministry of the Environment, 2008. **(*MECP Sewer Design Guidelines*)**

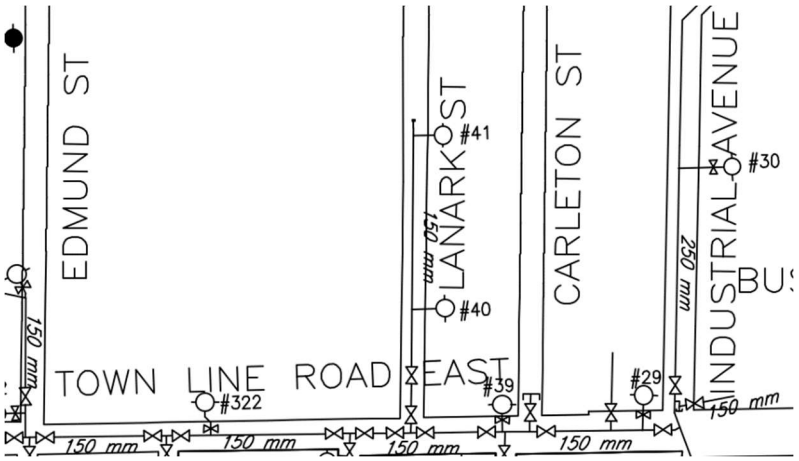
Other:

- Water Supply for Public Fire Protection, Fire Underwriters Survey, 2020. **(*FUS Guidelines*)**
- 2012 Ontario Building Code Compendium **(OBC Fire Protection Guidelines)**

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 the development units 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 2 below.

Table 2: Summary of Water Supply Design Criteria

Design Parameter	Value
Population Density – Single-family Home	3.4 persons/unit
Population Density – Townhome	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 3 below summarizes the anticipated domestic water demands based on a calculated population of 493 people for all units (single family home, townhomes and apartments) under average day, maximum day and peak hour conditions.

Table 3: Total Water Demand Summary

Water Demand Conditions	Water Demands (L/sec)
Average Day	1.60
Max Day	4.39
Peak Hour	6.60

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 4 below.

Table 4: 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	424m^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)	217 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 5: 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	Edmund Street Junction J-833
Approximate Ground Elevation	146.00m	137.50m	137.00m	140.00m
Average Day (Maximum HGL)	182.03m	182.02m	182.01m	182.03m
Peak Hour (Minimum HGL)	180.02m	180.04m	179.97m	180.10m

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

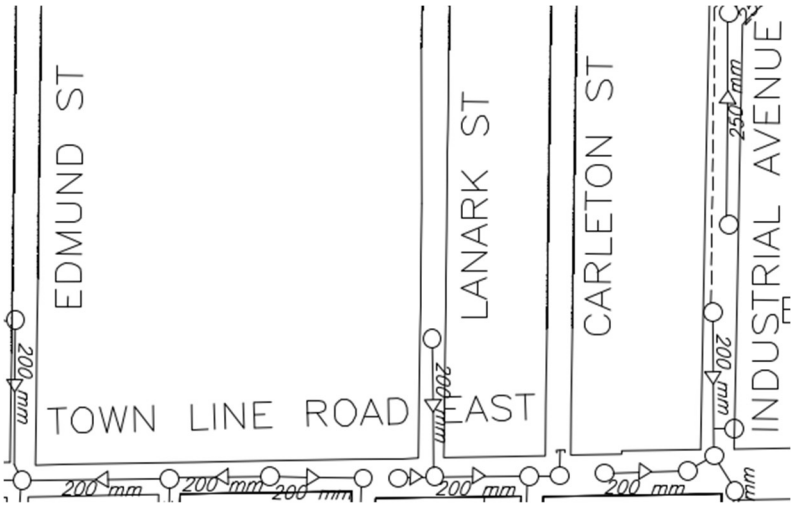
The calculated range of working pressures will be confirmed during detailed design once the structures and layout have been finalized. The calculated range of working pressures anticipated within the development under average day conditions were between 53 psi and 60 psi, and under peak hour conditions were between 51 psi and 60 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. Current calculations are conservative upon the finalization of the proposed structures size, location, and construction material. As part of the proposed design a 200mm watermain is required throughout the development.

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 existing sewers 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

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. Ultimately the sanitary flow will be conveyed to the existing Industrial Avenue Pumping Station. It is understood the existing pumping station currently does not have the residual capacity to support the development, however, the Town of Carleton Place is in the process of completing upgrades to increase the capacity of the station (including this subdivision). Upgrades are expected to be completed by 2025.

The design flow calculations for the proposed residential development were calculated using criteria from the City of Ottawa – Sewer Design Guidelines. Table below summarizes the guidelines used in the preliminary calculations.

Table 6: Sanitary Design Criteria

Design Parameter	Value
Population Density – Single-family Home	3.4 persons/unit
Population Density – Townhome	2.7 persons/unit
Population Density – Average Apartment	1.8 persons/unit
Residential Average Day Demand	280 L/day/person
Peaking Factor	Harmon's Peaking Factor with K=0.8
Manning's Roughness Coefficient	0.013
Dry Weather Infiltration	0.05 L/s/ha
Wet Weather Infiltration	0.28 L/s/ha
Total Infiltration	0.33 L/s/ha

Minimum Pipe Flow Velocity (Full)	0.6 m/s
Maximum Pipe Flow Velocity (Full)	3.0 m/s

Table 4 below summarizes the preliminary sanitary flow results. The sanitary sewer design sheet and Sanitary Drainage Area Plan can be found in Appendix D.

Table 7: Calculated Sanitary Flows

Site Area	6.26 ha
Population	493 Persons
Peaking Factor	3.38
Peak Flow	5.40 L/s
Infiltration Allowance	2.03 L/s
Total Design Flow	7.43 L/s

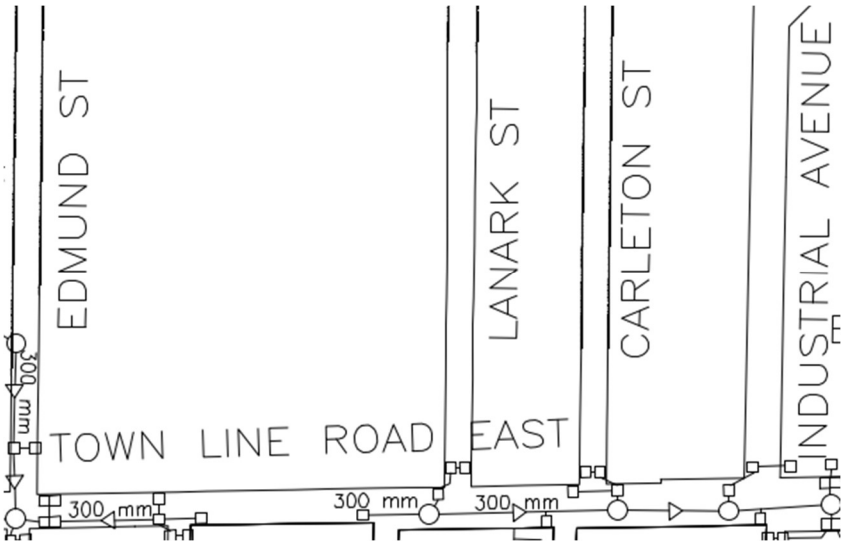
The proposed gravity sanitary sewers will be installed throughout the subject property with a minimum full flow target velocity (cleansing velocity) of 0.6 m/s and a full flow velocity of not more than 3.0 m/s. This may not be feasible on every length of pipe. This issue has been dealt with by increasing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

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. Within the Servicing and Stormwater Management Report by Robinson, the site has been accounted for with a population of 587 people and a flow of 8.44L/s. Therefore, it is anticipated that there will be no issues with capacity constraints within the downstream gravity sanitary sewer.

5.0 STORM SEWER

5.1 Existing Storm Sewers

The subject property is currently undeveloped with no existing infrastructure. There is a 300mm diameter storm sewer on Town Line Road East and a 300mm diameter storm sewer 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

Stormwater runoff will be conveyed through curb and gutter and rear-yard swale networks towards catchbasins, where it will be captured and conveyed into the new storm sewer network. The storm sewers are designed with a minimum of 1.5m cover. The storm sewer network within the subdivision is designed to accommodate a storm event with a 5-year return period (rational method). Storms in excess of this event will result in surcharging at catchbasin and road sag locations. Stormwater runoff during these major events will be conveyed via overland flow routes within rear-yard swales and along the roadway.

The storm sewers in the subdivision will be directed to an OGS and a detention facility before outletting to the proposed sewers as detailed in the Carleton / Lanark Subdivision Servicing and Stormwater Management Report. A 1350mm diameter storm sewer stub is proposed at Lanark Street as an outlet for our site. The flows will be conveyed through the Carleton / Lanark Subdivision (Sunnyhill Subdivision) sewers, OGS, detention pond, and ultimately to the ditch on Industrial Avenue. In coordinating with the adjacent developer, it is understood Wintergreen Subdivision will require a level of quantity and quality control. Preliminary details can be found in the Stormwater Management Report completed by EGIS.

A combination of PVC and concrete storm sewers ranging from 200 mm to 1200 mm in diameter will be installed throughout the subdivision. 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 and Drainage Area Plan in Appendix E of this report for more details.

A preliminary review of the HGL results are detailed in the Stormwater Management Report. It is expected that sump pumps will be utilized on this site due to the HGL being in close proximity to the USFs.

5.3 External Drainage Areas

External storm drainage areas EXT3 and EXT4, as shown on the drainage area plan in Appendix E, are proposed to in inlet to the site through Block 41. Due to storm sewer inverts and HGL elevations, these areas cannot be collected in the main storm sewer system being conveyed to the SWM pond. Alternatively, they will be collected in Block 41 within underground detention chambers sized to accommodate up to the 100-year event. An overflow outlet pipe has been proposed for the basin to outlet. The overflow pipe is proposed to be 300mm diameter storm sewer and will extend and outlet to the existing 300mm dimeter sewer on Edmund Street. See the Servicing Plan in Appendix A for layout details.

Details pertaining to all external areas and stormwater runoff are detailed in the Stormwater Management Report by Egis under a separate cover.

5.4 Major System Design

The pipe network within the subdivision will be designed to accommodate the 5-year storm event. The grading plan will be designed to make use of the roadway as the major drainage route for any storm event exceeding the design capacity of the storm sewer system. The grading of the roadway will be designed in a way to ensure that the major flows are directed towards the SWM Pond before being conveyed to the intersection at Lanark Street. As detailed the Servicing and Stormwater Management Report for adjacent development, overland flow for the subdivision will be directed to a low point in Lanark Street and through the Carleton / Lanark Subdivision ultimately to the ditch along Industrial Avenue. It should be noted that due to site constraints, there are no other feasible options to convey overland flow. See Grading Plan in Appendix A for details. A detailed lot grading and drainage plan will prepared during detailed design outlining the proposed drainage pattern within the subdivision.

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 8: 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 MECP 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.

7.1 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.

7.2 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, wastewater, 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,

EGIS Canada Inc.

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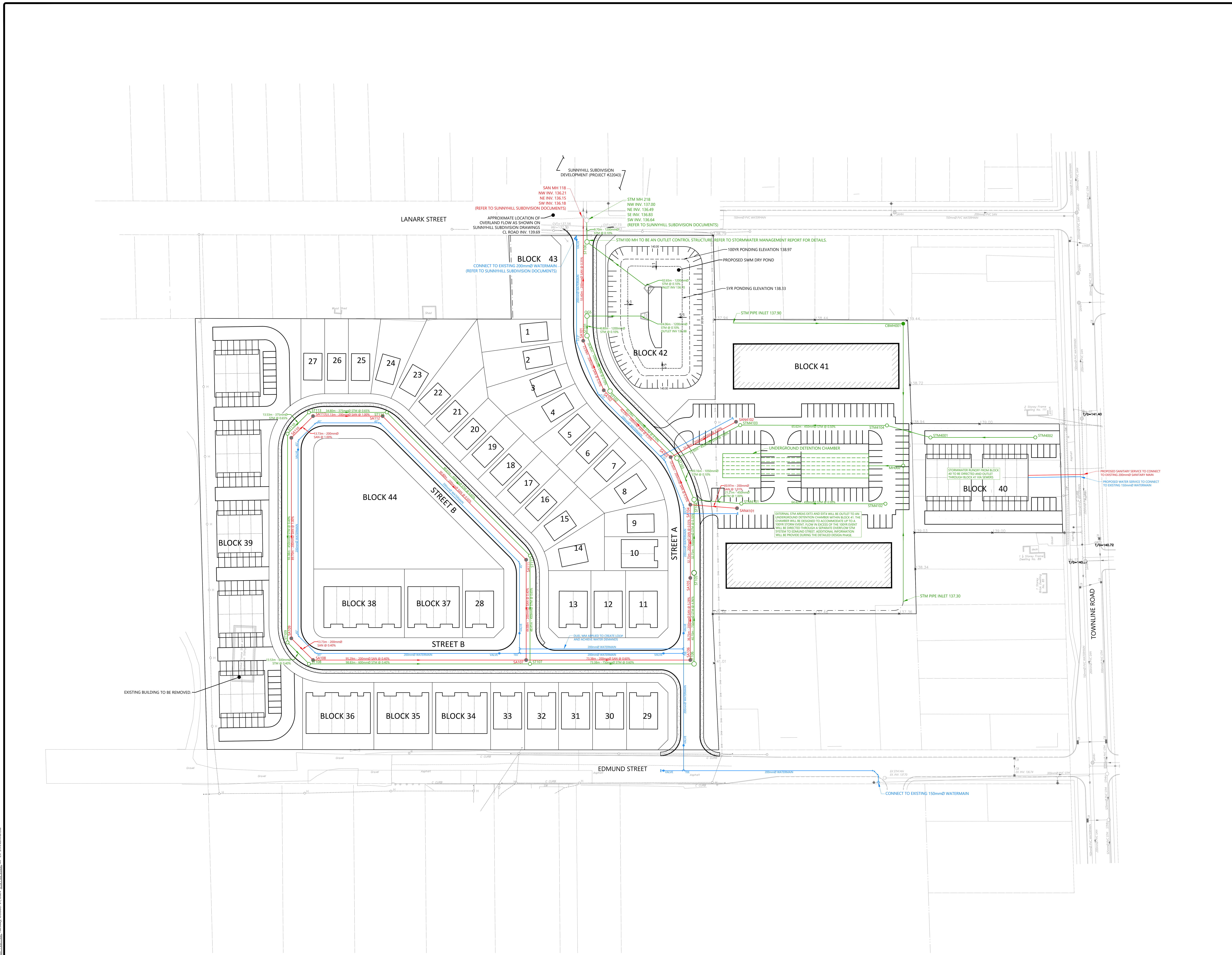
9.0 STATEMENT OF LIMITATIONS

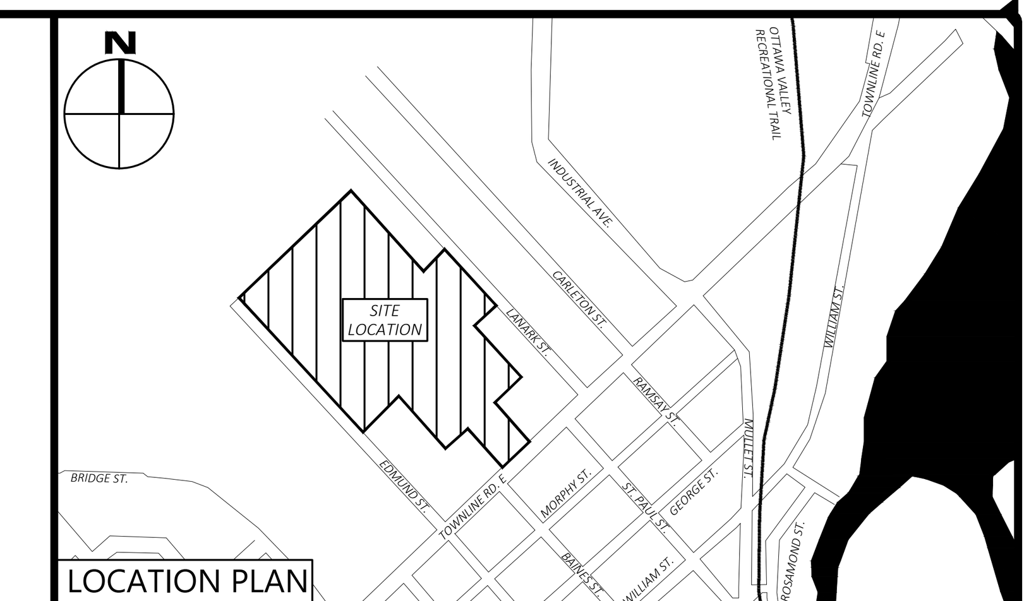
This report was produced for the exclusive use of Wintergreen Ridge Ltd. The purpose of the report is to assess the existing servicing and provide recommendations and designs for the post-construction scenario that are in compliance with the guidelines and standards from the Ministry of the Environment, Conservation and Parks, Town of Carleton Place and local approval agencies. Egis reviewed the site information and background documents listed in Section 2.0 of this report. While the previous data was reviewed by Egis 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. Egis 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, Egis should be requested to re-evaluate the conclusions presented in this report, and provide amendments, if required.

APPENDIX A
SERVICING AND GRADING PLAN





LEGEND

- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED WATERMAIN
- EMERGENCY OVERLAND FLOW ROUTE
- OG 138.95 — ORIGINAL GROUND ELEVATION
- FG 142.85 — FINISHED GRADE ELEVATION
- SAN 139.36 — PROPOSED SANITARY INVERT
- STM 139.86 — PROPOSED STORM INVERT

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No.	Revisions	Date
1	ISSUED FOR DRAFT PLAN APPROVAL	OCT. 01, 2024

Check and verify all dimensions before proceeding with the work — Do not scale drawings

SCALE 1 : 750 (0 – 25 – 50 – 75 Metres)

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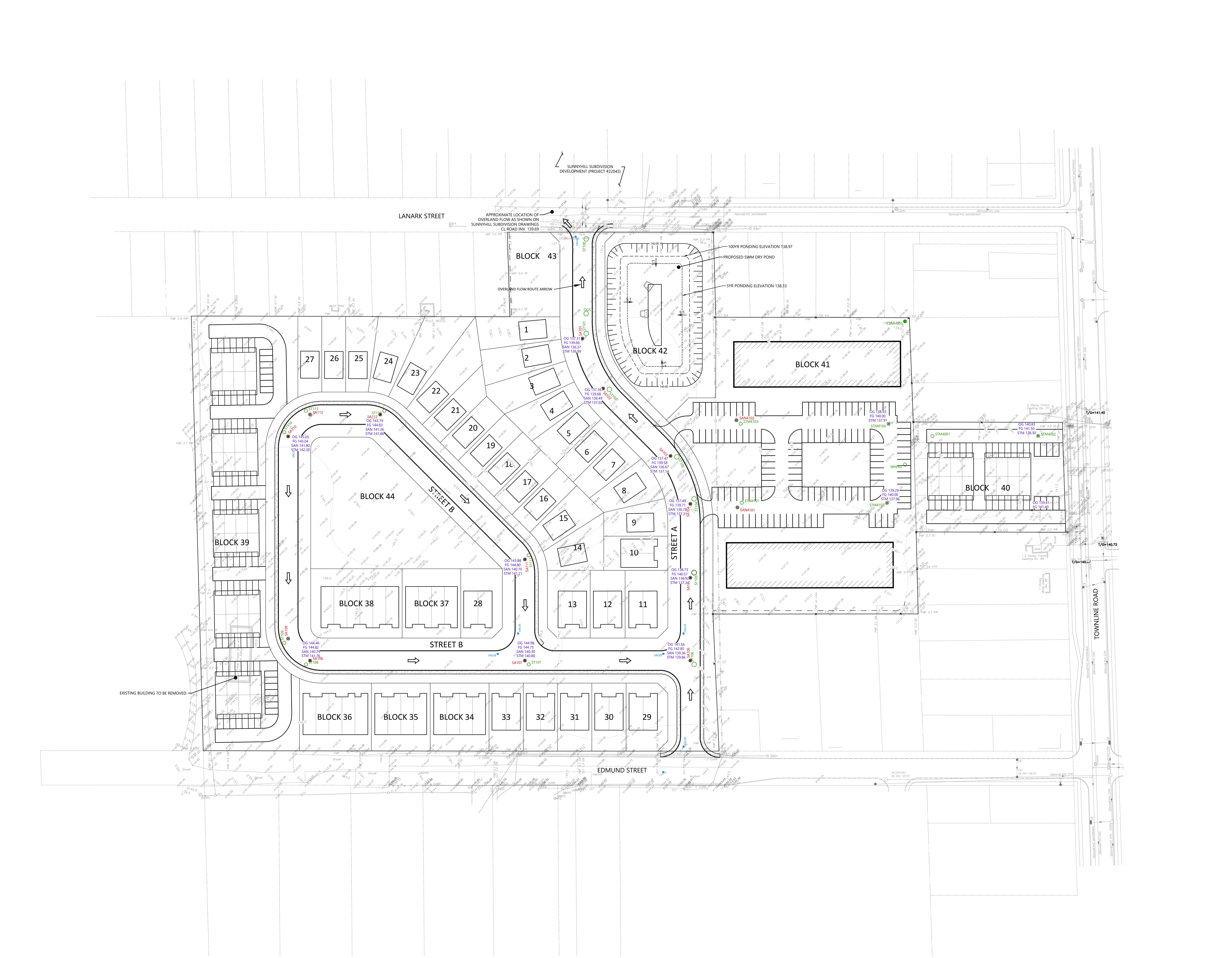
Stamp:

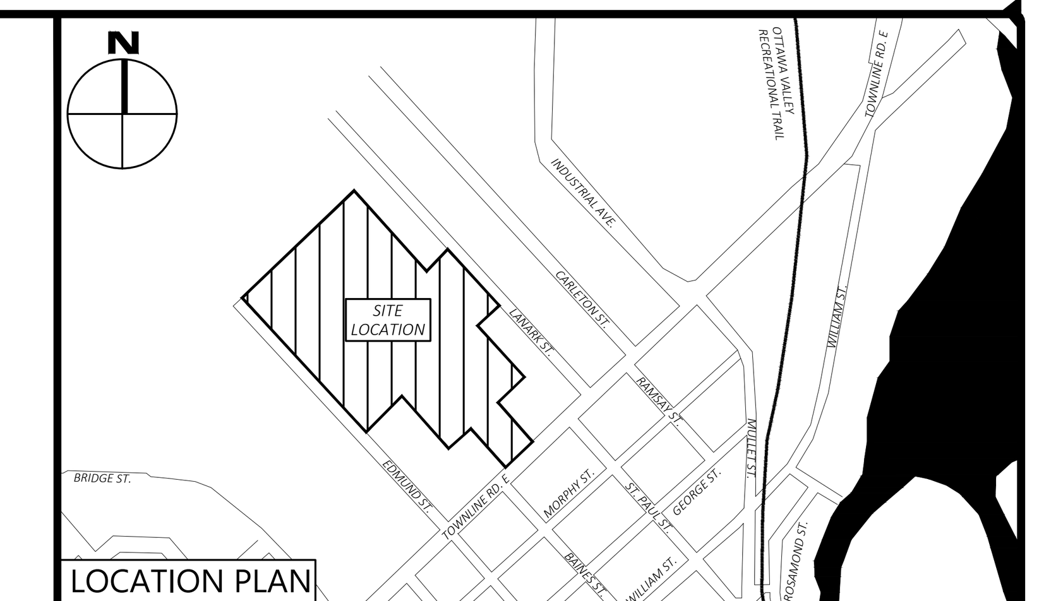
Client: WINTERGREEN RIDGE LTD.

Project: WINTERGREEN RIDGE SUBDIVISION
400 LANARK STREET

Drawing Title: SERVICING PLAN

Scale: 1:750	Project Number: CCO-22-0957-01
Drawn By: C.H.	
Checked By: B.C.	Drawing Number: C100
Designed By: C.H.	





LEGEND

- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED WATERMAIN
- EMERGENCY OVERLAND FLOW ROUTE
- OG 138.95 / FG 342.85 / SAN 139.36 / STM 139.86 — ORIGINAL GROUND ELEVATION / FINISHED GRADE ELEVATION / PROPOSED SANITARY INVERT / PROPOSED STORM INVERT

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NOT FOR CONSTRUCTION

No.	Revisions	Date
1	ISSED FOR DRAFT PLAN APPROVAL	OCT. 01, 2024

Check and verify all dimensions before proceeding with the work — Do not scale drawings

SCALE 1 : 750 — 0, 25, 50, 75 Metres

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Stamp:

Client: WINTERGREEN RIDGE LTD.

Project: WINTERGREEN RIDGE SUBDIVISION
400 LANARK STREET

Drawing Title: GRADING PLAN

Scale: 1:750	Project Number: CCO-22-0957-01
Drawn By: C.H.	
Checked By: B.C.	Drawing Number: C200
Designed By: C.H.	

APPENDIX B
PRE-CONSULTATION NOTES

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

WATER DEMAND CALCULATIONS

APARTMENT

PROJECT: 400 Lanark
LOCATION: Carleton Place
CLIENT: Wintergreen Development

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	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	7						23.8	2.75	4.13	0.08	4.63	0.21	12.73	0.32	19.11	167.00	10,000
	J-2	2	2			41		86.0	2.75	4.13	0.28	16.72	0.77	45.99	1.15	69.06	167.00	10,000
	J-3				16	41		117.0	2.75	4.13	0.38	22.75	1.04	62.56	1.57	93.96	167.00	10,000
	J-4		14					37.8	2.75	4.13	0.12	7.35	0.34	20.21	0.51	30.36	167.00	10,000
	J-5	6	4	12				63.6	2.75	4.13	0.21	12.37	0.57	34.01	0.85	51.07	167.00	10,000
	J-6	8			16			70.4	2.75	4.13	0.23	13.69	0.63	37.64	0.94	56.54	167.00	10,000
	J-7			11	24			94.5	2.75	4.13	0.31	18.38	0.84	50.53	1.26	75.89	167.00	10,000
TOTALS		23	20	23	56	82	0	493.1			1.60	95.88	4.39	263.67	6.60	395.99		

Design Parameters:

Single Family	3.4	p/p/u
TH/SD	2.7	p/p/u
BtB TH	2.7	p/p/u
Average Apartment	1.8	p/p/u
	3	
	3	

Notes:

1. Domestic Flow: 280 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) = 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: CH

Project No.: CCO-22-0957

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

Building No. / Type: APARTMENT

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)
3	=	200	100%	200	
3	=	200	100%	200	
1	=	200	100%	200	**400**
B1	=	200	0%	0	
		Input:			

CH

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: **APARTMENT**

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	2.6	Type V	18	2	36	22%	50%	2975	8925
South	8.7	Type V	13	2	26	16%			
East	11	Type V	18.2	2	36.4	12%			
West	30	Type V	8.8	2	17.6	0%			
			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**

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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	=	**212**	100%	212	
1	=	**212**	100%	212	**424**
B1	=	**212**	0%	0	
		Input:			

CH

C. Determine Required Fire Flow

RFF = **220 x C x √A** = 6795 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: **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	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 East	15	Type V	21	2	42	12%	23%	1369	7319
Sout West	0	Type V	0	0	0	0%			
North West	0	Type V	0	0	0	0%			
South East	27.8	Type V	16.3	2	32.6	11%			
			Input:						

G. Determine the Total Required Fire Flow

Total Required Fire Flow, Rounded to the Nearest 1,000 L/min =	7000 L/min
Total Required Fire Flow (L/sec) =	117 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) =	**117 L/sec**

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

Building No. / Type: APARTMENT

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)
4	=	**1500**	100%	1500	
3	=	**1500**	100%	1500	
2	=	**1500**	100%	1500	**6000**
1	=	**1500**	100%	1500	
B1	=	**1500**	0%	0	
		Input:			

CH

C. Determine Required Fire Flow

RFF = **220 x C x √A** = 25562 L/min
= **26000 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%**	**-3900 L/min**	**22100 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: **APARTMENT**

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%	-6630 L/min	15470 L/min
Standard water supply for system and Fire Department hose line	-10%	Yes	-10%	-2210 L/min	13260 L/min
Fully supervised system	-10%	No	0%	0 L/min	13260 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	69	Type V	69.3	5	346.5	0%	0%	0	13260
West	30.6	Type V	9.9	2	19.8	0%			
East	24.2	Type V	4	2	8	0%			
South	0	Type V	0	0	0	0%			
			Input:						

G. Determine the Total Required Fire Flow

Total Required Fire Flow, Rounded to the Nearest 1,000 L/min =	13000 L/min
Total Required Fire Flow (L/sec) =	217 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) =	**217 L/sec**

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Ontario Building Code 2006 - Fire Flow Calculations

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

Ontario 2006 Building Code Compendium (Div. B - Part 3)

Water Supply for Fire-Fighting **- 4 Unit Townhouse**

Building is classified as Group: **C (Residential Occupancies)** (from table 3.1.2.1)

Building is of combustible construction. Floor assemblies are fire separations but with no fire-resistance ratings. Roof assemblies, mezzanies, loadbearing walls, columns and arches do not have a fire-resistance rating.

From Div. B A-3.2.5.7. of the Ontario Building Code - 3. Building On-Site Water Supply:

(a) Q = K x V x Stot

where:

Q = minimum supply of water in litres

K = water supply coefficient from Table 1

V = total building volume in cubic metres (assume 1 storey is 3m if not provided)

S_{tot} = total of spatial coefficient values from the property line exposures on all sides as obtained from the formula:

$S_{tot} = 1.0 + [S_{side1}+S_{side2}+S_{side3}+S_{side4}]$

K	**23**	(from Table 1 pg A-31) (Worst case occupancy {E / F2} 'K' value used)
V	**1,469**	(Total building volume in m^3.)
S_{tot}	**2.2**	(From figure 1 pg A-32)
Q =	**74,321.28 L**	

3

3

From Table 2: Required Minimum Water Supply Flow Rate (L/s)

				Approximate Separation Distance	280.00
S_{north}	12	m	0.0		
S_{east}	2.4	m	0.6		
S_{south}	36	m			
S_{south}	36	m	0.0		
S_{west}	2.4	m	0.6		

Total Required Fire Flow:	**2700**	**L/min (if Q <108,000L)**
	45	**L/sec**
	713	**GPM**

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Ontario Building Code 2006 - Fire Flow Calculations

Building No. / Type: **Townhome** **APARTMENT**

Ontario 2006 Building Code Compendium (Div. B - Part 3)

Water Supply for Fire-Fighting **- 4 Unit Townhouse**

Building is classified as Group: **C (Residential Occupancies)** (from table 3.1.2.1)

Building is of combustible construction. Floor assemblies are fire separations but with no fire-resistance ratings. Roof assemblies, mezzanies, loadbearing walls, columns and arches do not have a fire-resistance rating.

From Div. B A-3.2.5.7. of the Ontario Building Code - 3. Building On-Site Water Supply:

(a) Q = K x V x Stot

where:

Q = minimum supply of water in litres

K = water supply coefficient from Table 1

V = total building volume in cubic metres (assume 1 storey is 3m if not provided)

S_{tot} = total of spatial coefficient values from the property line exposures on all sides as obtained from the formula:

$S_{tot} = 1.0 + [S_{side1}+S_{side2}+S_{side3}+S_{side4}]$

K	**23**	(from Table 1 pg A-31) (Worst case occupancy {E / F2} 'K' value used)
V	**3,852**	(Total building volume in m^3.)
S_{tot}	**2.2**	(From figure 1 pg A-32)
Q =	**194,911.20 L**	

3

3

From Table 2: Required Minimum Water Supply Flow Rate (L/s)

			Approximate Separation Distance		280.00
S_{north}	50	m			
S_{east}	3	m			0.6
S_{south}	36	m			
S_{south}	36	m			0.0
S_{west}	3	m			0.6

Total Required Fire Flow:	**6300**	**L/min (if Q >190,000 <270,000L)**
	105	**L/sec**
	1664	**GPM**

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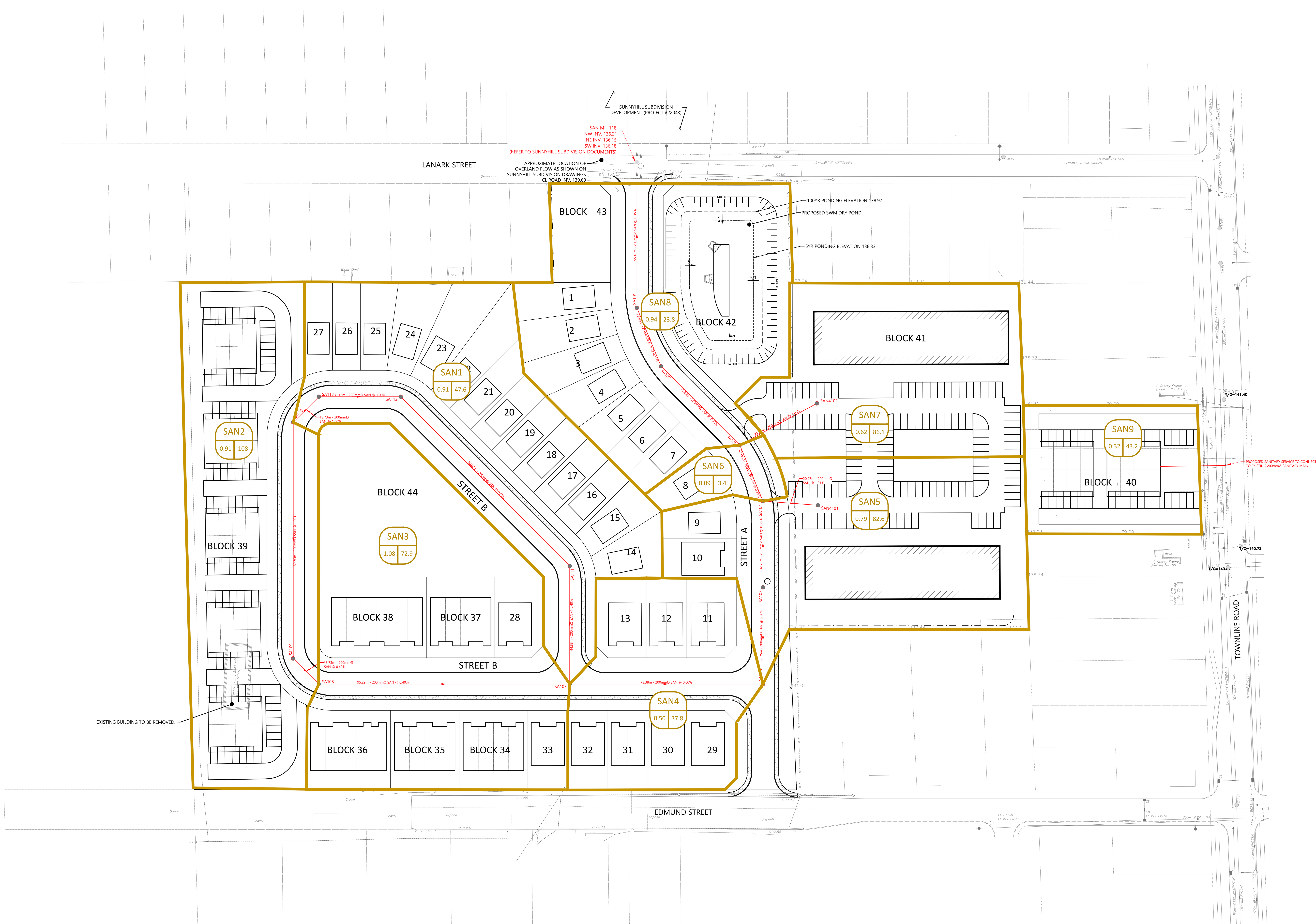
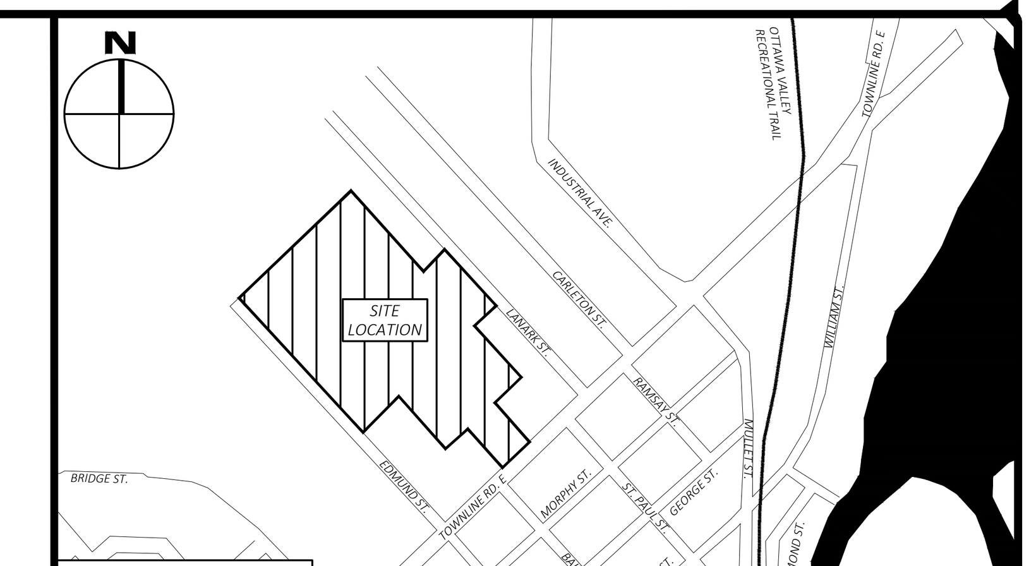
APPENDIX D
SANITARY CALCULATIONS





LOCATION PLAN

LEGEND

AREA I.D.

SAN1

1.00 | 100.0

AREA SIZE (HECTARES)

POPULATION

FOR REVIEW ONLY
NOT FOR CONSTRUCTION

No.	Revisions	Date
1	ISSUED FOR DRAFT PLAN APPROVAL	OCT. 01, 2024

Check and verify all dimensions before proceeding with the work

Do not scale drawings

SCALE 1 : 750

0 25 50 75 Metres

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N

Stamp:

Client:

WINTERGREEN RIDGE LTD.

Project:

WINTERGREEN RIDGE SUBDIVISION
400 LANARK STREET

Drawing Title:

SANITARY DRAINAGE AREA PLAN

Scale: 1:750	Project Number: CCO-22-0957-01
Drawn By: C.H.	
Checked By: B.C.	Drawing Number: SAN
Designed By: C.H.	

SANITARY SEWER DESIGN SHEET

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

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	30	31
STREET	AREA ID	FROM MH	TO MH	UNIT TYPES				AREA (ha)	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 (%)	VELOCITY (full) (m/s)	AVAILABLE CAPACITY	
				SF	SD	TH	APT		IND	CUM			INSTITUTIONAL		COMMERCIAL		INDUSTRIAL			IND	CUM								L/s	(%)
													IND	CUM	IND	CUM	IND	CUM											
Street B	SAN1	110	113	14				0.96	47.6	47.6	3.66	0.56		0.00		0.00		0.00	0.00	0.96	0.96	0.32	0.88	34.22	13.73	200	1.00	1.055	33.34	97.43
		113	112						0.0	47.6	3.66	0.56		0.00		0.00		0.00	0.00	0.00	0.96	0.32	0.88	34.22	31.13	200	1.00	1.055	33.34	97.43
		112	111						0.0	47.6	3.66	0.56		0.00		0.00		0.00	0.00	0.00	0.96	0.32	0.88	25.38	90.80	200	0.55	0.782	24.50	96.53
		111	107						0.0	47.6	3.66	0.56		0.00		0.00		0.00	0.00	0.00	0.96	0.32	0.88	21.64	44.88	200	0.40	0.667	20.76	95.93
Street B	SAN2	110	109			40		0.91	108.0	108.0	3.59	1.26		0.00		0.00		0.00	0.00	0.91	0.91	0.30	1.56	34.22	89.70	200	1.00	1.055	32.66	95.45
		109	108						0.0	108.0	3.59	1.26		0.00		0.00		0.00	0.00	0.00	0.91	0.30	1.56	21.64	13.73	200	0.40	0.667	20.08	92.81
	SAN3	108	107		4	23		1.08	72.9	180.9	3.53	2.07		0.00		0.00		0.00	0.00	1.08	1.99	0.66	2.73	21.64	95.29	200	0.40	0.667	18.91	87.40
	SAN4	107	106		14			0.45	37.8	266.3	3.48	3.00		0.00		0.00		0.00	0.00	0.45	3.40	1.12	4.12	26.50	73.38	200	0.60	0.817	22.38	84.44
Street A	SAN5	106	105	1	2		41	1.11	82.6	348.9	3.44	3.89		0.00		0.00		0.00	0.00	1.11	4.50	1.49	5.37	78.62	36.75	200	5.28	2.424	73.25	93.16
		105	104						0.0	348.9	3.44	3.89		0.00		0.00		0.00	0.00	0.00	4.50	1.49	5.37	20.24	32.75	200	0.35	0.624	14.87	73.45
	SAN6	104	103	1				0.09	3.4	352.3	3.44	3.93		0.00		0.00		0.00	0.00	0.09	4.59	1.51	5.44	20.24	23.02	200	0.35	0.624	14.80	73.13
	SAN7	103	102				41	0.62	73.8	426.1	3.41	4.70		0.00		0.00		0.00	0.00	0.62	5.21	1.72	6.42	20.24	42.29	200	0.35	0.624	13.82	68.26
	SAN8	102	101	7				0.94	23.8	449.9	3.40	4.95		0.00		0.00		0.00	0.00	0.94	6.15	2.03	6.98	20.24	23.99	200	0.35	0.624	13.26	65.50
		101	*Ex.MH*						0.0	449.9	3.40	4.95		0.00		0.00		0.00	0.00	0.00	6.15	2.03	6.98	20.24	55.40	200	0.35	0.624	13.26	65.50
Block 40	SAN9	BLDG	*EX. SEWER*			16		0.32	43.2	43.2	3.66	0.51		0.00		0.00		0.00	0.00	0.32	0.32	0.11	0.62	34.22	24.67	200	1.00	1.055	33.60	98.19

Design Parameters:

Residential				ICI Areas			
							Peak Factor
SF	3.4	p/p/u					
SD/TH	2.7	p/p/u		INST	28,000	L/Ha/day	1.5
APT - 1 room	1.4	p/p/u	<<<<	COM	28,000	L/Ha/day	1.5
APT - 2 room	2.1	p/p/u	<<<<	IND	35,000	L/Ha/day	MOE Chart
APT - average	1.8	p/p/u					
Other	60	p/p/Ha					

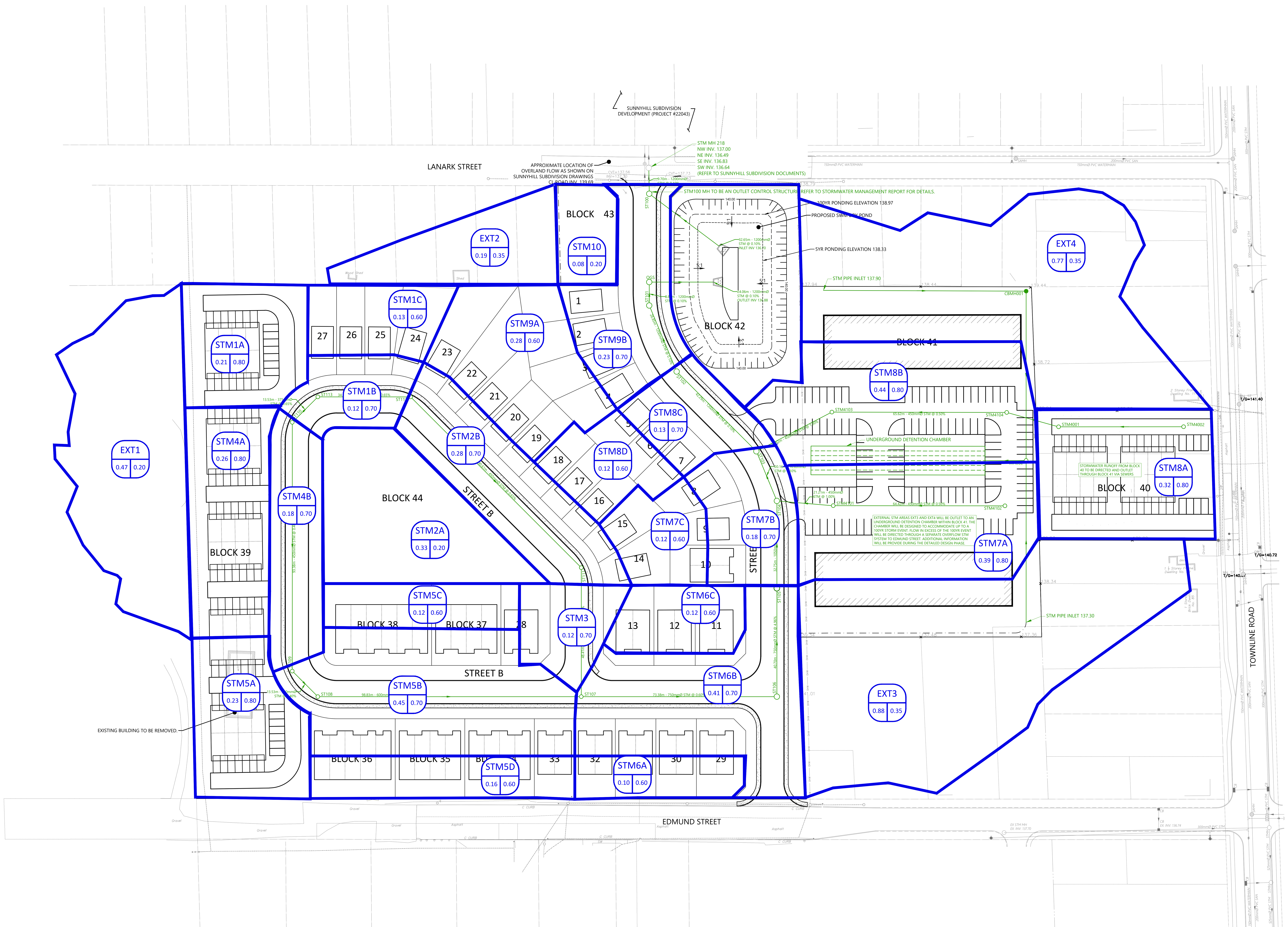
Notes:

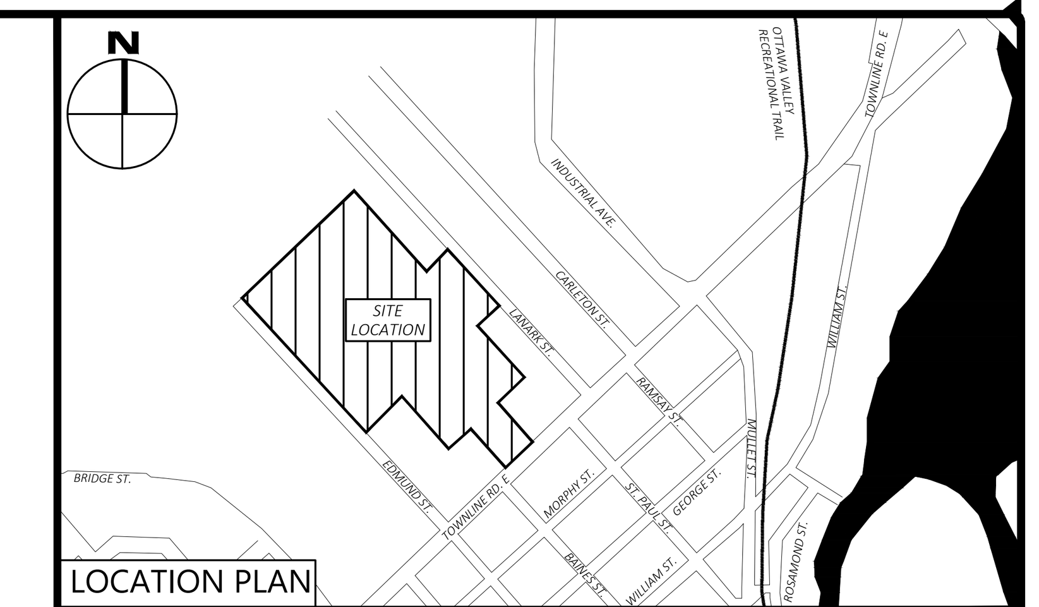
1. Mannings coefficient (n) = 0.013
2. Demand (per capita): 280 L/day
3. Infiltration allowance: 0.33 L/s/Ha
4. Residential Peaking Factor:
   Harmon Formula = 1+(14/(4+P^0.5)*0.8)
   where P = population in thousands

Designed:	C.H.
Checked:	B.C.
Project No.	CCO-22-0957
Sheet No,:	1 of 1

No.	Revision	Date
1	ISSUED FOR DRAFT PLAN APPROVAL	OCT. 01, 2024

APPENDIX E
STORMWATER MANAGEMENT CALCULATIONS





LOCATION PLAN

LEGEND

AREA I.D — STM1

AREA SIZE (HECTARES) — 1.00

RUNOFF COEFFICIENT — 0.50

FOR REVIEW ONLY
NOT FOR CONSTRUCTION

No.	Revisions	Date
1	ISSUED FOR DRAFT PLAN APPROVAL	OCT. 01, 2024

Check and verify all dimensions before proceeding with the work

Do not scale drawings

SCALE 1 : 750

0 25 50 75 Metres

egis

115 Walgreen Road, R.R.3
Carp, ON K0A 1L0
Tel: 613-836-2184
Fax: 613-836-3742
www.egis-group.com

N

Stamp:

Client:

WINTERGREEN RIDGE LTD.

Project:

WINTERGREEN RIDGE SUBDIVISION
400 LANARK STREET

Drawing Title:

SERVICING PLAN

Scale: 1:500	Project Number: CCO-22-0957-01
Drawn By: C.H.	
Checked By: B.C.	Drawing Number: C100
Designed By: C.H.	

STORM SEWER DESIGN SHEET

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

LOCATION				AC								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	0.50	0.60	0.70	0.80	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)	(%)
Street B	STM1	110	113				0.09	0.12	0.21	0.31	0.31	10.00	0.17	10.17	104.19	122.14	178.56	88.63	103.90	151.90		88.63	147.47	13.53	375			0.65	1.293	58.83	39.90%
		113	112							0.00	0.31	10.62	0.45	11.07	101.01	118.40	173.06	85.93	100.72	147.22		85.93	147.47	34.80	375			0.65	1.293	61.54	41.73%
	STM2	112	111	0.33				0.28		0.26	0.57	12.11	1.03	13.14	94.25	110.43	161.36	148.82	174.38	254.80		148.82	239.80	90.61	450			0.65	1.461	90.97	37.94%
	STM3	111	107					0.12		0.08	0.65	13.69	0.55	14.24	88.04	103.12	150.63	159.57	186.92	273.03		159.57	239.80	48.41	450			0.65	1.461	80.22	33.45%
Street B	EXT1, STM4	110	109	0.47				0.18	0.26	0.43	0.43	10.00	1.36	11.36	104.19	122.14	178.56	123.97	145.33	212.46		123.97	188.11	93.38	450			0.40	1.146	64.14	34.10%
	STM5	109	108				0.28	0.45	0.23	0.67	1.10	11.52	0.16	11.68	96.79	113.43	165.76	294.65	345.28	504.58		294.65	405.13	13.53	600			0.40	1.388	110.48	27.27%
		108	107							0.00	1.10	12.87	1.19	14.06	91.14	106.77	155.98	277.43	325.02	474.83		277.43	405.13	98.83	600			0.40	1.388	127.70	31.52%
Street B	STM6	107	106				0.22	0.41		0.42	2.17	13.69	0.62	14.31	88.04	103.12	150.63	530.12	620.95	907.02		530.12	899.63	73.38	750			0.60	1.973	369.51	41.07%
Street B		106	105							0.00	2.17	14.45	0.14	14.59	85.38	99.99	146.04	514.10	602.10	879.35		514.10	1,426.59	40.70	600			4.96	4.888	912.50	63.96%
	STM7	105	104				0.10	0.18	0.39	0.50	2.66	14.59	0.54	15.13	84.91	99.44	145.23	628.83	736.46	1,075.55		628.83	900.87	32.75	1050			0.10	1.008	272.04	30.20%
		104	103							0.00	2.66	15.13	0.33	15.46	83.14	97.36	142.17	615.71	721.03	1,052.91		615.71	900.87	20.16	1050			0.10	1.008	285.15	31.65%
	STM8	103	102				0.10	0.13	0.76	0.76	3.42	15.46	0.64	16.10	82.09	96.12	140.36	781.14	914.71	1,335.64		781.14	1,286.19	42.29	1200			0.10	1.102	505.05	39.27%
	STM9	102	101				0.22	0.23		0.29	3.72	16.10	0.41	16.51	80.15	93.85	137.02	828.02	969.51	1,415.49		828.02	1,286.19	26.85	1200			0.10	1.102	458.17	35.62%
		101	OGS							0.00	3.72	16.51	0.13	16.64	78.98	92.47	134.99	815.87	955.22	1,394.53		815.87	1,286.19	8.80	1200			0.10	1.102	470.32	36.57%
		OGS	Pond							0.00	3.42	16.10	0.36	16.47	80.15	93.85	137.02	762.74	893.06	1,303.88		762.74	1,286.19	24.06	1200			0.10	1.102	523.46	40.70%
		Pond	100							0.00	3.72	16.51	0.49	17.00	78.98	92.47	134.99	815.87	955.22	1,394.53		815.87	1,286.19	32.65	1200			0.10	1.102	470.32	36.57%
		100	*Ex.MH*							0.00	3.72	16.64	0.15	16.79	78.60	92.02	134.34	811.97	950.64	1,387.81		811.97	1,286.19	9.70	1200			0.10	1.102	474.22	36.87%

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:	C.H.
Checked:	B.C.
Project No.:	CCO-22-0957
Sheet No,:	1 of 1

No.	Revision	Date
1	ISSUED FOR DRAFT PLAN APPROVAL	2024-10-01