



UAV
Services

Site
Investigation
and Due
Diligence

Group
Engineering

Environmental

Preliminary
Engineering



Land Development
Consulting Engineers

Site Plan
Design

Contract
Administration

Subdivision
Detailed
Design

Stormwater
Management
Design

Public Sector
Engineering

Servicing & Stormwater Management Report Rental Unit Base 31

Picton, Ontario



Prepared for
PEC Community
Partners Inc.

Submission Date
February 2026, rev.
July 2026

Project No.
2365B

Table of Contents

	Page
1.0 Introduction	1
1.1 Purpose of the Report	1
1.2 Proposed Development	1
1.3 Background Servicing Information	3
2.0 Geotechnical and Hydrogeological Conditions	5
3.0 Topography and Grading	6
3.1 Existing Conditions Topography	6
3.2 Proposed Conditions Site Grading	6
4.0 Storm Drainage	7
4.1 Existing Conditions	7
4.1.1 Storm Drainage	7
4.1.2 Storm Servicing	7
4.2 Proposed Conditions	7
4.2.1 Storm Drainage	7
4.2.2 Storm Servicing	8
4.2.2.1 Minor System	8
4.2.2.2 Major System	9
5.0 Stormwater Management	10
5.1 Village A – Base 31 Stormwater Management Facility	10
5.2 Onsite Quantity Controls	11
6.0 Sanitary Servicing	13
6.1 Existing Sanitary Servicing	13
6.2 Proposed Sanitary Servicing	14
7.0 Water Servicing	17
7.1 Existing Water Servicing	17
7.2 Proposed Water Servicing	18
8.0 Utility Considerations	20
9.0 Erosion and Sediment Control During Construction	21
10.0 Summary	22

List of Figures

Figure 1.1	Site Location Plan
Figure 4.1	Existing Storm Drainage Plan
Figure 4.2	Proposed Storm Drainage Plan
Figure 6.1	Existing Sanitary System

List of Drawings

Drawing N-1	General Notes
Drawing S-1	Servicing Plan
Drawing STRM-1	Interim Storm Drainage Plan – Phase 1 Only
Drawing STRM-2	Ultimate Storm Drainage Plan – Phase 1 and 2
Drawing 201	Storm Drainage Plan (Village-A Subdivision)
Drawing 302	Sanitary Drainage Plan (Village-A Subdivision)
Drawing GR-1	Grading Plan
Drawing ESC-1	Erosion and Sediment Control Stage 1
Drawing ESC-2	Erosion and Sediment Control Stage 2
Drawing ESC-3	Erosion and Sediment Control Notes
Drawing ESC-4	Erosion and Sediment Control Details
Drawing 906	Details Plan 6 (Village-A Subdivision)
Drawing DS-1	Design Sheet – Sanitary
Drawing DS-2	Design Sheet – 5 Year Storm (Rental Building Site Plan)
Drawing DS-3	Design Sheet – 100 Year Storm (Rental Building Site Plan)
Drawing DS-4	Design Sheet – 5 Year Storm (Subdivision)

List of Appendices

Figures

Drawings

Appendix A	Site Plan
Appendix B	Background Information
Appendix B1	Pre-Consultation Memo
Appendix B2	Geotechnical Report
Appendix B3	Topographic Survey
Appendix B4	Village A Civil Design Drawings
Appendix B5	Village A SWM Report
Appendix B6	Village A Functional Servicing and Stormwater Management Report (FSSR)
Appendix B7	Water and Wastewater Treatment Uncommitted Reserve Capacity Report
Appendix C	Stormwater Management Calculations

Appendix D	Storm Sewer Servicing Calculations
Appendix E	Water Distribution Analysis
Appendix E1	Fire Flow Memo
Appendix E2	Picton Heights Booster Pump Station Upgrade Report, Design Drawings and Supporting Information
Appendix E3	Watermain Hydraulic Analysis and Water Demands
Appendix E4	Water Flow Meter Sizing and Selection Memorandum

Submission History

Submission	Date	In Support Of	Distributed To
1 st	February 2026	Site Plan Approval	Prince Edward County
2 nd	July 2026	Site Plan Approval	Prince Edward County

1.0 Introduction

SCS Consulting Group Ltd. has been retained by PEC Community Partners Inc ('PEC') to prepare a Site Servicing and Stormwater Management (SWM) Report for a proposed residential development located within the community of Picton, in Prince Edward County.

1.1 Purpose of the Report

This Site Servicing and SWM Report has been prepared in support of the Site Plan application for Village A – Southern Medium Density Block (“the proposed development”) located at the northeast corner of County Road 22 and Kingsley Road. The proposed development is located within the proposed Village A Draft Plan of Subdivision, as identified in the Village A – Base 31 Functional Servicing and Stormwater Management Report by SCS Consulting Group Ltd. dated August 2025 and the Village A – Base 31 Stormwater Management Report by SCS Consulting Group Ltd. dated December 2025. The proposed Village A draft plan of subdivision and the Village A – Southern Medium Density Block Site Plan are provided in **Appendix A**.

The purpose of this report is to demonstrate that the proposed development can be accommodated by the proposed Village A external storm, sanitary and water infrastructure and to demonstrate that it can be graded and serviced in accordance with the Ontario Building Code, Prince Edward County, Quinte Conservation and the Ministry of Environment, Conservation and Parks (MECP) design criteria.

This report has been prepared in collaboration with RA Engineering Inc. and DLW Engineering Ltd. with regard to the mechanical aspects of water and wastewater facilities.

1.2 Proposed Development

The proposed development is approximately 1.42 ha and is bound by County Road 22 to the west, Kingsley Road and the Base 31 Revitalization District to the south, the proposed Village A residential Draft Plan of Subdivision to the east and a future phase, Phase 2, of the Village A – Southern Medium Density Block to the north. The proposed development lands are currently vacant. Refer to **Figure 1.1** for the subject site in context of its surroundings.



Figure 1.1: Site Location Plan

The proposed development will consist of a 120 unit seven-storey residential rental building with surface parking fronting County Road 22 and two blocks of freehold townhomes consisting of 4 units in each block fronting Kingsley Road, (refer to the Site Plan in **Appendix A**). Access to the proposed development is proposed from County Road 22 and Kingsley Road.

1.3 Background Servicing Information

A pre-consultation meeting with Prince Edward County was completed for this application on January 12, 2026 and comments were provided to the applicant via email. Refer to **Appendix B1** for the pre-consultation meeting summary.

The following design guidelines and standards were used in preparation of the servicing, grading and stormwater management (SWM) strategies for the proposed development:

- Sanitary, Storm and Water Systems Design Manual, prepared by the County of Prince Edward, March 2023;
- Grading and Drainage Manual, prepared by the County of Prince Edward, March 2023;
- Transportation Design Manual, prepared by the County of Prince Edward, March 2023;
- Ministry of Environment, Conservation, and Parks (MECP) Environmental Compliance Approval for a Municipal Stormwater Management System (April 2022);
- Quinte Conservation Stormwater Management Submission Guidelines, Quinte Conservation (May 2012);
- Bay of Quinte Remedial Action Plan (BQRAP) Implementation Area Stormwater Management Design Guidelines (Revised March 2006);
- Stormwater Management Planning and Design Manual, prepared by Ministry of Environment (March 2003); and
- The Ontario Building Code (2024).

The following documents were used in preparation of the servicing, grading and SWM strategies for the proposed development:

- Water Distribution Analysis Report for the Proposed Interim Historic District, Phase 1 of Rental Unit and Phase 1 of Village A Development, prepared by RAE Engineering, dated July 24, 2026;
- Geotechnical Investigation; Building A – Village A Development, Southern Medium Density Block, prepared by Gemtec, dated July 20, 2026;
- Fire Flow Memorandum – The Base 31 Revitalization District, prepared by DLW Engineering Services, dated February 2026;
- Letter re: Stormwater Management Pond Outfall Target Flow, prepared by SCS Consulting Group Ltd., dated February 2026;
- Picton Heights Booster Pumping Station Upgrades Design Report, prepared by DLW Engineering Services, dated July 2025;
- Base31 Subdivision – Village A – Phase 1, Draft Plan of Subdivision 13-T-24-504 Civil Engineering Design Drawings, prepared by SCS Consulting Group, dated June 2026;

- Village A – Base 31 Stormwater Management Report, prepared by SCS Consulting Group, dated June 2026; and
- Village A – Base31 Functional Servicing and Stormwater Management Report, prepared by SCS Consulting Group, dated August 2025.
- Prince Edward County’s Analysis of Water and Wastewater Treatment Uncommitted Reserve Capacity Report, dated September 11, 2025

2.0 Geotechnical and Hydrogeological Conditions

Gemtec has completed a geotechnical investigation for the proposed rental building development entitled Geotechnical Investigation – Building A – Village A Development, dated February 3, 2026 include here as **Appendix B2**. The information in this section of the report is derived from Gemtec's report.

The site is located within the physiographic region of southern Ontario, known as the Prince Edward Peninsula. This region consists of clays, sandy/silty sands and till deposits and is underlain, specifically in the subject site, by Palaeozoic bedrock.

As noted in the Geotechnical Investigation (Gemtec, 2026), the geotechnical and hydrogeological information for the proposed rental building development is derived from the previously conducted investigation that was completed for the larger development area of Village A which was carried out in July to August 2024. This investigation included the advancement of 18 boreholes and 47 test pits throughout the Village A Draft Plan limits. Monitoring wells were installed on 7 of the 18 boreholes to monitor groundwater levels. Of the 18 completed boreholes, BH24-3, BH24-4 and BH24-17 are considered the most relevant to the proposed rental building development. BH24-4 and BH24-17 had monitoring wells installed within them.

The subsurface conditions at the site generally consist of topsoil (50 mm to 125 mm), overlying silty sand to silt sand and gravel, overlying the weathered bedrock. Bedrock was encountered at depths ranging from 0.30 mbgs to 1.6 mbgs.

The groundwater levels recorded in monitoring wells BH24-4 and BH24-17, were recorded at depths ranging from 2.8 to 3.9 mbgs (137.6- 140.8 m). Groundwater levels at the site are anticipated to vary between and beyond borehole locations, and fluctuate on a seasonal basis.

As noted in the Geotechnical Report (Gemtec, 2026), dewatering requirements will be dependent on excavation depths, construction methodologies and the groundwater levels at the time of construction. Should pumping volumes exceed 50,000 L/day, an application under the Environmental Activity Section Registry of the Ministry of Environment Conservation and Parks should be submitted.

3.0 Topography and Grading

3.1 Existing Conditions Topography

An existing topographic survey has been completed by Schaeffer Dzaldov, dated May 1st, 2023. A copy of this survey has been included in **Appendix B3** for reference.

The existing topography of the proposed development has gradients in the range of 0.5% to 8.0% and generally slopes from its highest point at the southeast corner, located along Kingsley Road, to its lowest point at the northwest corner, located along County Road 22. The ground surface elevations through the proposed development range from approximately 147.25 m adjacent to Kingsley Road, to approximately 140.75 m adjacent to County Road #22.

3.2 Proposed Conditions Site Grading

In general, the site is proposed to be graded in a manner which satisfies the following criteria:

- Satisfy lot and site plan grading best practices including:
 - Minimum Parking Lot Grade: 0.5%
 - Maximum Parking Lot Grade: 5.0%
 - Maximum Parking Lot Driveway Entrance Grade: 8.0%
 - Minimum Lot Grade: 2%
 - Maximum Lot Grade: 5%
- Provide continuous site grades for overland flow conveyance;
- Minimize the need for retaining walls;
- Minimize the volume of bedrock excavation;
- Achieve the stormwater management objectives required for the site; and
- Meet all applicable Accessibility for Ontarians with Disabilities Act, 'AODA' guidelines and standards.

The grading design for the proposed development is provided on the site Grading Plan (**Drawing GR-1**). The proposed development has been graded with an emphasis on minimizing the required cut and on-site excavations in consideration of the bedrock present on the subject site.

4.0 Storm Drainage

4.1 Existing Conditions

4.1.1 Storm Drainage

Under existing conditions, the subject lands generally drain northwesterly overland towards County Road 22, where flows are conveyed via the easterly road side ditch to an existing 400 mm diameter culvert. Refer to Catchments 101 and 102 on Figure 4.1. Drainage then crosses County Road 22, and is conveyed within a swale towards the top of the valley slope, ultimately draining to Marsh Creek.

A small portion of the southeast corner of the site adjacent to Kingsley Road (Catchment 103, 0.03 ha) drains overland towards Kingsley Road, and is conveyed easterly through the road side ditch, ultimately to East Lake.

Refer to **Figure 4.1** for the existing conditions drainage area plan.

4.1.2 Storm Servicing

Currently, there are no storm sewer services present within, or adjacent to the subject site. However, the proposed development is part of the greater Village A Draft Plan of Subdivision, for which there is a storm sewer proposed within the Courtland Court right-of-way to service the subject development. This storm sewer has been sized to accommodate the 5 year design storm flow from the proposed development. Refer to **Appendix B4** for the Storm Sewer Drainage Plans and Storm Sewer Design Sheets (SSDS) for Village A.

4.2 Proposed Conditions

4.2.1 Storm Drainage

Drainage from Phase 1 of the proposed development will ultimately drain via minor and major systems through Phase 2 of the proposed development towards Courtland Court and the Village A – Phase 1 Stormwater Management (SWM) Facility. Until such time as Phase 2 is designed and constructed, there is an interim condition whereby major system drainage from Phase 1 will not be able to flow overland towards the SWM Facility. Accordingly, an interim storm drainage strategy is required, consisting of five (5) catchments, as described below. Refer to **Figure 4.2** for an illustration of the proposed interim drainage conditions.

Inlet control devices (ICD's) will be placed on catchbasins throughout the site (CB2, CB3, CBMH85 and CBMH86, refer to **Drawing S-1**). Flows above the capacity of the ICD's for all storm events, up to an including the 100 year storm event, from Catchment 201

(refer to **Figure 4.2**) will be conveyed overland into the Phase 2 lands, apart from the flows directed to CB1 (refer to **Figure 4.2**) where the 100 year flows will be captured, and flows from Catchment 202 will be collected via internal storm drainage and piped into the minor storm sewer system. Additionally, runoff (up to and including the 100 year storm event) from a portion of the Phase 2 lands (Catchment 203, refer to **Figure 4.2**) along with the flows that spill into these lands from Phase 1 will be captured via a temporary DICB1 in the Phase 2 lands and conveyed through the proposed storm sewer system, discharging to MH47 within Courtland Court as well.

Until Phase 2 of the proposed development develops, runoff from Catchment 204 (i.e the remainder of the Phase 2 lands) will continue draining northwesterly towards County Road 22, where it will be conveyed via the roadside ditch to the existing culvert crossing, as it does under existing conditions.

Runoff from Catchment 205 (refer to **Figure 4.2**) will also drain overland via the roadside ditch of County Road 22.

A culvert is required at the proposed entrance to the subject development from County Road 22 to convey flows from Catchment 205 northerly within the eastern ditch towards to the existing culvert crossing County Road 22. Twin 200 mm diameter HDPE driveway culverts have been sized in accordance with the County Standards. Refer to **Appendix C** for sizing calculations and Servicing Plan (**Drawing S-1**) for the location of the culvert.

4.2.2 Storm Servicing

4.2.2.1 Minor System

The private storm sewer system (minor system) within the proposed development will be designed for the 5 year return period storm event. The storm sewers are proposed to drain through the future Phase 2 lands connecting to the proposed service connection (MH90) from Courtland Court, within the Village A – Phase 1 subdivision (refer to **Drawing S-1**).

The storm sewer system has been designed in accordance with the County Standards, Ontario Building Code and MECP guidelines, including the following:

- Maximum Flow Velocity: 6.0 m/s
- Minimum Flow Velocity: 1.0 m/s
- Minimum Pipe Depth: 1.5 m to obvert

The private storm sewer network will collect roof drainage and the majority of the parking lot runoff via several catchbasins throughout the site.

The storm sewers and catchbasin leads within the site will have slopes ranging between 0.35% and 5% (typical) and will be kept shallow to minimize cut activities on-site. Refer to **Drawings DS-2** and **DS-3** for the proposed ultimate and interim storm sewer design sheets, respectively, for the proposed development.

4.2.2.2 Major System

Under interim conditions until such time as Phase 2 of the proposed development is developed, the major system flows (above the capacity of the ICD's provided within the catchbasins (refer to **Drawing S-1**) up to and including the 100 year storm event) from Phase 1 of the proposed development (Catchment 201, refer to **Figure 4.2**), will be conveyed through a spillway towards the Phase 2 lands overland to an interim 100 year capture point within the site at DICB1, refer to **Drawing S-1**. The 100 year flows will be captured and conveyed from this point through the proposed storm sewer to MH47 within Courtland Court of the Village A development and ultimately discharge to the Village A SWM Facility. The 100 year catchbasin capture calculations have been included in **Appendix D**. Further to this, flows up to and including the 100 year storm event from a portion of the future Phase 2 lands (Catchment 203, refer to **Figure 4.2**) will be directed to the temporary DICB as well, and will be captured and conveyed through the proposed storm sewer system to MH47 with the Courtland Court right-of-way.

Upon the development of Phase 2 of the proposed development, major system flows from Phase 1 will continue to be conveyed overland through Phase 2 to Courtland Court. The storm sewer system will convey the 5 year flows from both phases to MH47 within Courtland Court, where flows will be conveyed to the Village A SWM Facility through the minor system. Major system flows from the proposed development will be conveyed overland to Courtland Court, where flows will be directed to the Village A SWM Facility via the overland flow route. Further details on the proposed development Phase 2 storm servicing will be provided under a separate Site Plan Application. Refer to Village A – Base 31 Stormwater Management Report by SCS Consulting Group Ltd., dated June 2026 for more information on the minor and major system design for Village A (**Appendix B5**).

5.0 Stormwater Management

5.1 Village A – Base 31 Stormwater Management Facility

As discussed in the Village A – Base 31 Stormwater Management Report prepared by SCS Consulting Group Ltd., dated June 2026, the Village A SWM Facility has been sized to provide quality, erosion and quantity controls for Catchment 2101 which includes the subject development, as illustrated on the Post Development Drainage Plan (Figure 3.1) included in **Appendix B5**.

An analysis of the proposed imperviousness based on the Site Plan for Phase 1 of the proposed development was completed to ensure the Village A SWM facility has been designed with sufficient capacity to accommodate the development. Originally, as part of the design of the Village A SWM facility, the overall weighted percent imperviousness of the drainage area contributing to the SWM Facility was determined utilizing a percent imperviousness applied to each land use based on the proposed draft plan. A percent imperviousness of 85% was applied to the entire 2.76 ha area for the medium density block (for which the proposed development is a part of) as indicated on the Village A draft plan, resulting in an allowable Area x Imperviousness ($A \times I$) value of 2.35 ($2.76 \text{ ha} \times 0.85 = 2.35$) contributing to the SWM Facility. Refer to Appendix A and Appendix E of the Village A – Base 31 Stormwater Management Report prepared by SCS Consulting Group Ltd., dated June 2026 included as **Appendix B5** for the proposed Village A draft plan and parameter sheet used to size the Village A SWM Facility.

A measured percent imperviousness based on the proposed Site Plan and interim drainage conditions for Phase 1 has been determined, refer to **Appendix C** for supporting calculations. The proposed drainage area contributing to the Village A SWM Facility under interim conditions is 1.99 ha with a measured imperviousness of 76%, resulting in a proposed $A \times I$ value of 0.93 contributing to the SWM Facility in the interim condition.

The proposed $A \times I$ value of the area contributing to the SWM Facility under interim conditions of 0.93 is less than the allocated $A \times I$ value of 2.52. The proposed SWM Facility therefore will have adequate capacity to meet the quality, erosion and quantity control criteria established in the Village A – Base 31 Stormwater Management Report by SCS Consulting Group Ltd. dated June 2026.

Based on the current understanding of the proposed development Phase 2 Site Plan, it has been established that an additional 0.93 ha with an imperviousness of 88% will ultimately contribute to the Village A SWM Facility. The total ultimate drainage area contributing to the Village A SWM Facility is 2.29 ha with an overall imperviousness of 81%, resulting in an $A \times I$ value 1.85. As such the Village A SWM Facility will have the capacity to provide the SWM controls under the ultimate conditions. The drainage

contributing to the SWM Facility under ultimate conditions once Phase 2 of the proposed development develops will be further evaluated and confirmed through the separate Site Plan Application for these lands.

5.2 Onsite Quantity Controls

As noted above, the SWM facility has adequate capacity to provide the required SWM controls under interim (Phase 1) and ultimate (Phase 1 and 2) conditions. The storm sewers within the Village A – Phase 1 development, have been sized to accommodate the 5 year flows generated under ultimate conditions (from Phases 1 and 2). The capacity allocated to the storm sewer within Courtland Court at MH 47 to convey 5 year flows from the proposed development to the SWM Facility is 309 L/s. Refer to **Appendix B4** for the Village A SSDS. However, as noted above, major flows are unable to be conveyed overland to the Village A SWM Facility under interim conditions, and it is therefore proposed to capture the 100 year flows from Catchments 201, 202 and 203, and convey these flows to MH47 within the Courtland Court right-of-way.

Using the Rational Method, measured runoff coefficients based on the proposed Site Plan, Prince Edward County rainfall intensity information and the time of concentration established in the SSDS for flows entering MH47 from the proposed Phase 1 development, the 100 year peak flow generated by Catchments 201, 202 and 203 under the interim conditions was determined to be 361 L/s. The proposed flows exceed the capacity allocated to the Courtland Court storm sewer system from the proposed development. Onsite controls are therefore required under the interim condition, until such time as the proposed development Phase 2 lands develop, and the major system flows can be conveyed overland to the Village A SWM Facility. Refer to **Appendix D** for the proposed development SSDS.

Onsite controls are proposed to be provided through a temporary 315 mm diameter orifice plate placed on the southwestern opening of MH90 within Courtland Court, to control flows to be less than or equal to 309 L/s at a maximum ponding elevation of 143.14 m within the storm sewer system. Using the Modified Rational Method, it was determined that approximately 64.8 m³ of storage is required to control the proposed 100 year flow to 301 L/s. This storage is proposed to be provided within the storm sewers and underground structures (maintenance holes/catchbasins), as well as within a depression formed within Catchment 203, where flows are captured by the DICB1.

Based on the proposed servicing, as illustrated on **Drawing S-1**, 50.2 m³ of storage is available within the storm sewer system and underground structures at a ponding elevation of 143.14 m. Additionally, based on the proposed grading, as illustrated on **Drawing GR-1**, an additional 63.1 m³ of surface storage is, resulting in a total storage volume of 113.4 m³. The proposed flows from the subject site in the interim condition will therefore not exceed the allowable release rate of 309 L/s allocated to the

Courtland Court storm sewer from the proposed development. Supporting calculations are included in **Appendix C**.

Ultimately, as Phase 2 of the Site Plan develops, the orifice plate will be removed to allow for the minor storm sewer system to drain to the MH47 uncontrolled, with major flows being conveyed overland. Further discussion will be provided with a separate Site Plan Application for Phase 2.

6.0 Sanitary Servicing

6.1 Existing Sanitary Servicing

As identified on the site Servicing Plan (**Drawing S-1**), the Village A – Base31 Functional Servicing and Stormwater Management Report (**Appendix B6**) and the Base31 Subdivision – Village A – Phase 1 Civil Engineering Design Drawings plan and profiles (**Drawings 416, 425, 428-431, Appendix B4**), the sizes and locations of the existing sanitary infrastructure surrounding the proposed development are:

- An existing 75 mm and 200 mm diameter private sanitary force main flowing north on County Road 22 from the existing private sanitary pump station located at the south end of the Revitalization District, to just north of London Avenue, where it connects to an existing 200 mm diameter municipal gravity sanitary sewer. The existing 200 mm diameter municipal gravity sanitary sewer conveys sanitary flows to the Lalor Sanitary Pump Station and ultimately to the Picton Water Pollution Control Plant;
- The Lalor Sanitary Pumping Station (SPS) located on the east side of Lalor Street, located north of the proposed development; and
- The Picton Water Pollution Control Plant (WPCP) on the west side of Church Street, located north of the proposed development.

There is no existing sanitary connection servicing the proposed development lands.

All existing sanitary flows from the residential area north of the proposed development and Village A lands are conveyed by a 200 mm diameter sanitary sewer across County Road 22 to the Lalor SPS.

From the Lalor SPS, the sanitary flow from all of Picton is pumped to the WPCP, located south of the Lalor SPS.

The Lalor SPS has existing capacity to accommodate the proposed development as described in Section 7 of the attached accepted Village A – Base 31 Functional Servicing and Stormwater Management Report, prepared by SCS Consulting Group, dated August 2025 (**Appendix B5**).

The Picton WPCP has existing uncommitted reserve capacity to accommodate 1010 dwelling units at 2.4 people per unit as detailed in the attached Prince Edward County's Analysis of Water and Wastewater Treatment Uncommitted Reserve Capacity Report dated September 11, 2025 (**Appendix B**). As Phase 1 of the proposed Rental Building development is made up of 120 rental units and 8 townhomes (234 people), there is sufficient capacity in the existing WPCP to accommodate the proposed development.

It is understood that the County, per their MSP process will dictate will dictate future expansion requirements for the WPCP.

The existing sanitary network is also shown on **Figure** below:

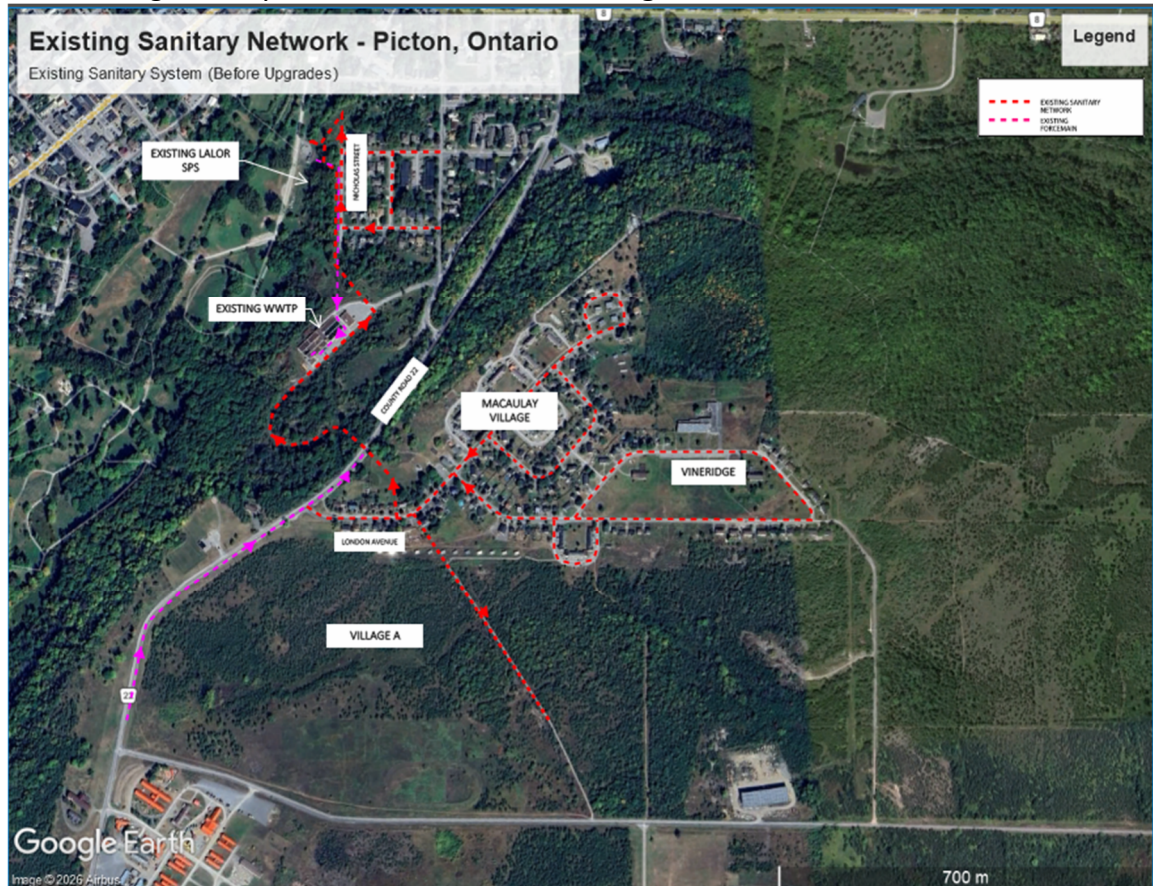


Figure 6.1: Existing Sanitary System

6.2 Proposed Sanitary Servicing

As part of the proposed Village A – Phase 1 external sanitary sewer improvements, a proposed 200 mm diameter municipal sanitary sewer will be constructed on Kingsley Road, flowing north east and connecting to the proposed 200 mm diameter municipal sanitary sewer on Fox Tail Drive within Base31 Subdivision – Village A – Phase 1. Refer to the Base31 Subdivision – Village A – Phase 1 Civil Engineering Design Drawings plan and profiles (**Drawings 426-431, Appendix B**) for details of the proposed Village A sanitary infrastructure.

The proposed development will be supplied with the following connections from the proposed Village A – Phase 1 sanitary infrastructure:

- 8x individual 125 mm diameter gravity sanitary service connections from the proposed 200 mm diameter sanitary sewer on Kingsley Road, to service the 8 freehold townhomes which front Kingsley Road; and
- A proposed 200 mm diameter sanitary service connection (MH97A) extending from the proposed 200 mm diameter sanitary sewer on Cortland Court to service Phase 1 and the future Phase 2 of the proposed rental building development.

The proposed connections have been designed in accordance with Prince Edward County and MECP sanitary design criteria including but not limited to that which is identified below, as well as a total population of 570 which accounts for both Phase 1 and Phase 2 of the proposed development. This results in a total flow of 8.9 L/s (including infiltration). Refer to the updated Village A – Phase 1 sanitary design sheet (**Drawing DS-1, Appendix G**) for the calculated sanitary flow from the proposed development.

Prince Edward County and MECP sanitary design criteria:

- Slopes ranging between 0.5% and 2% (typically) and will be provided at 3.3 m to 5 m deep.
- Residential Sanitary Generation Rate: 320 L/c/day (excluding extraneous flows)
- Residential Population Density:
 - Medium Density – Triplexes, fourplexes, townhouses - 2.5 PPU.
 - High Density – apartment Dwellings – at the following PPU:
 - Bachelor/1 Bedroom – 1.4 PPU
 - 2 Bedroom – 2.1 PPU
- Peaking Factor: Harmon (Min 2.0)
- Infiltration Rate: 0.28 L/s/ha
- Minimum pipe size: 200 mm diameter in residential areas
- Minimum pipe cover: 2.5 below centerline road elevation to obvert
- Maximum velocity: 3.0 m/s at full flow
- Minimum actual velocity: 0.6 m/s
- Minimum slope (first run): 1.0%

Refer to the, the site Servicing Plan (**Drawing S-1**), the updated Village A – Phase 1 Sanitary Drainage Plan (**Drawing 302**) and updated Village A- Phase 1 Sanitary Design Sheet (**Drawing DS-1**) for the sanitary design for the proposed development.

A total population of 755 people from the proposed development have been accounted for in the Village A – Phase 1 sanitary design as identified in the accepted Village A –

Base 31 Functional Servicing and Stormwater Management Report prepared by SCS Consulting Group dated August 2025 It should be noted that this population is further broken down into 570 people from Phase 1 and 2 of the proposed development with the balance of the population (185 people) being accounted for in the future townhomes on Kingsley Road, Fox Tail Drive and Courtland Court as demonstrated on the sanitary drainage plans and design sheets (**Drawings 302 and 1001, Appendix B4**) in the Base31 Subdivision – Village A – Phase 1, Draft Plan of Subdivision 13-T-24-504 Civil Engineering Design Drawings, prepared by SCS Consulting Group, dated June 2026. Therefore, there will be sufficient capacity in the proposed Village A – Phase 1 sanitary sewers to accommodate the proposed development. An updated sanitary drainage plan and design sheet (**Drawing 302 and Drawing DS-1**) for the Village A – Phase 1 subdivision is included in the site plan drawing set which separates the population of the proposed development from the remainder of the proposed development.

7.0 Water Servicing

7.1 Existing Water Servicing

The proposed development is located within the Picton Heights/Macaulay Village pressure zone, which is supplied with water by the Picton Reservoir and Macaulay Village Booster Pumping Station and Picton Water Treatment Plant (WTP) located within Picton Bay.

The Picton WTP has existing uncommitted reserve capacity to accommodate 1118 dwelling units at 2.4 people per unit as detailed in the attached Prince Edward County's Analysis of Water and Wastewater Treatment Uncommitted Reserve Capacity Report dated September 11, 2025 (**Appendix B**). As Phase 1 of the proposed Rental Building development is made up of 120 rental units and 8 townhomes (234 people), there is sufficient capacity in the existing WTP to accommodate the proposed development.

It is understood that the County, per their MSP process will dictate future expansion requirements for the WTP.

As identified on the site Servicing Plan (**Drawing S-1**), the Village A – Base31 Functional Servicing and Stormwater Management Report (**Appendix B6**) and the Base31 Subdivision – Village A – Phase 1 Civil Engineering Design Drawings plan and profiles (**Drawings 412, 416, 422, 425, 428-431, 441, Appendix B4**) the sizes and locations of the existing water infrastructure surrounding the proposed development are:

- An existing 300 mm diameter private watermain located on the west side of County Road 22 which extends from the Base 31 Revitalization District to the existing Picton Reservoir and Macaulay Village Booster Pumping Station;
- An existing 350 mm diameter municipal watermain located on the west side of County Road 22 which extends from the existing Picton Water Treatment Plant to the Picton Reservoir and Macaulay Village Booster Pumping Station; and
- The existing Picton Reservoir and Macaulay Village Booster Pumping Station (BPS) located on the west side of County Road 22, north-west of the subject site.

There is no existing water connection servicing the proposed development lands.

It should be noted that the existing 300 mm diameter private watermain located on the west side of County Road 22, is intended to transition to public ownership with the development of Village A – Phase 1. Refer to General Plan drawings 101 to 103 of the Base31 Subdivision – Village A – Phase 1 Civil Engineering Design Drawings for the extent of the watermain that is proposed to transition to public ownership (**Appendix B4**).

7.2 Proposed Water Servicing

As part of the proposed Village A – Phase 1 external watermain improvements, a proposed 300 mm diameter watermain will be constructed on Kingsley Road, extending east from County Road 22 to proposed Street C of the Village A – Phase 1 subdivision. The proposed 300 mm diameter watermain will connect to the existing 300 mm diameter watermain on County Road 22. Refer to the Base31 Subdivision – Village A – Phase 1 Civil Engineering Design Drawings plan and profiles (**Drawing 422, Appendix B4**) for details.

The proposed development will be supplied with the following connections from the proposed Village A – Phase 1 water infrastructure:

- A proposed 200 mm diameter PVC watermain connection for the proposed Phase 1 Rental building from the proposed 300 mm diameter watermain on Kingsley road;
- A proposed 200 mm diameter PVC watermain connection for the future Phase 2 portion of the proposed development from Courtland Court; and
- Eight proposed 19 mm diameter type 'K' copper water connections from the proposed 300 mm diameter watermain on Kingsley Road. One for each of the eight proposed townhomes fronting Kingsley Road.

DLW Engineering in partnership with RA Engineering have been retained to prepare a hydraulic model and general assessment of the existing and proposed system. This includes validating domestic and fire flow demands, sizing internal watermains and service connections, and assessing the pressure impacts on the surrounding system. Additionally, the assessment includes an analysis of the residual supply and storage capabilities of the BPS and Heights Reservoir. Results of this model and assessment are provided in the following reports:

- Fire Flow Memorandum – The Base 31 Revitalization District, prepared by DLW Engineering Services, dated February 2026 (**Appendix E1**);
- Water Distribution Analysis Report for the Proposed Interim Historic District, Phase 1 and 2 of Rental Unit Residential Homes in Block 291 & 292 , Phase 1 of Village A Development and Future Vineridge Development, prepared by RA Engineering, dated July 24, 2026 (**Appendix E2**);
- Picton Heights Booster Pumping Station Upgrades Design Report, prepared by DLW Engineering Services, dated July 2026 (**Appendix E3**); and
- Water Flow Meter Sizing and Selection Memorandum, prepared by RA Engineering, dated July 24, 2026 (**Appendix E4**).

As identified in the above reports, there is sufficient capacity in the existing and proposed water system to service the proposed development upon the completion of the external watermain improvements which are being constructed as part of the

proposed Village A – Phase 1 development. This includes the proposed watermain on Kingsley Road and the upgrade to the existing fire pump in the BPS.

As identified in the Water Distribution Analysis Report prepared by RA Engineering, the proposed water connections for the proposed development have been designed in accordance with Prince Edward County, MECP and OBC water design criteria, including but not limited to that which is identified below, as well as the site statistics (120 apartment rental units and 8 townhomes) for the proposed development as identified on the architectural site plan by Turner Fleischer Architects (**Appendix A**). This results in a total population of 234 (214 people for the rental building + 20 people for the townhomes) with a total water demand of 151.74 L/s (Max Day Demand + Fire). Refer to the Fire Flow Memorandum by DLW Engineering and the Water Distribution Analysis Report by RA Engineering (**Appendix E1**) for the calculated domestic and fire flow demand for the proposed development. Prince Edward County, MECP and OBC water design criteria:

- Residential Average Day Water Consumption Rate: 320 L/c/day
- Residential Population Density:
 - Medium Density – Triplexes, fourplexes, townhouses - 2.5 PPU.
 - High Density – apartment Dwellings – at the following PPU:
 - Bachelor/1 Bedroom – 1.4 PPU
 - 2 Bedroom – 2.1 PPU
- Minimum residential service connection size: 19 mm unless distance to main is greater than 30 m than minimum size shall be 25 mm
- Minimum pipe cover: 1.8 m below finished grade to obvert
- Fire Flow Demands – Ontario Building Code (OBC A-3.2.5.7)

A Water Flow Meter Sizing and Selection Memorandum was prepared by RA Engineering to confirm the size of the water meter for Phase 1 of the proposed development. As identified in RA Engineering's memorandum, a 150 mm water meter is recommended. Refer to the Water Flow Meter Sizing and Selection Memorandum by RA Engineering (**Appendix E4**) for the meter sizing calculations and full technical specifications.

Refer to the, the site Servicing Plan (**Drawing S-1**) for the proposed watermain layout for the proposed development.

8.0 Utility Considerations

Callidus Engineering, has been retained to prepare the site lighting design and coordinate the utility (electrical, gas, telecom) requirements and connections for the proposed development. Please refer to the plans prepared by Callidus Engineering (provided under separate cover as part of the site plan application submission) for details. The site lighting design has been superimposed onto the site servicing plan (Drawing S-1) and site grading plan (Drawing GR-1) and integrated with the civil engineering design to ensure there are no conflicts.

It is understood that all new utilities shall be buried where possible to protect against winter conditions and freezing. The 8 townhomes will be serviced by the existing utilities on Kingsley Road and the rental building will be serviced by the existing utilities and a proposed transformer located on the east side of County Road 22. Existing utilities shall remain in their current state.

9.0 Erosion and Sediment Control During Construction

Erosion and sediment control measures have been designed with a focus on erosion control practices (such as stabilization, track walking, staged earthworks, etc.) as well as sediment controls (such as fencing, mud mats, catchbasin sediment control devices, check dams and temporary sediment traps). These measures are designed and will be constructed as per the “Erosion and Sediment Control Guideline for Urban Construction” document (December 2019). Detailed erosion and sediment control plans (**Drawings ESC-1 to ESC-4**) have been prepared for the proposed development. The plans address phasing, inspection and monitoring aspects of erosion and sediment control. All reasonable measures will be taken to ensure sediment loading to the adjacent properties and drainage features are minimized both during and following construction.

10.0 Summary

This Servicing and Stormwater Management Report has been prepared in support of the Site Plan Application for the Village A – Southern Medium Density Block located at the north east corner of Kingsley Road and County Road 22 in community of Picton, Prince Edward County. This report outlines the means by which the proposed development can be graded and serviced in accordance with the Prince Edward County, Quinte Conservation Authority, the Ministry of Environment, Conservation and Parks and the Ontario Building Code design criteria and policies.

Grading

- The proposed development grading has been developed to match to the existing surrounding grades, and provide conveyance of stormwater runoff, including external drainage.
- The proposed development has been graded with an emphasis on minimizing the required cut and on-site excavations in consideration the bedrock present on the subject site.

Storm Drainage and Servicing

- Storm runoff will be conveyed by storm sewers designed in accordance with Municipality and MECP criteria.
- Storm sewers have been designed to capture, storage and discharge the 100 year storm for Phase 1 to MH47 within the Courtland Court right-of-way.

Stormwater Management

- The Village A SWM Facility has been sized to provide quality, erosion and quantity controls for Catchment 2101 which includes the subject development.
- The release rate allocated to the receiving storm sewer system with Courtland Court from the proposed development is 309 L/s.
- Under interim conditions flows up to the 100 year storm event will be captured onsite, and released to the storm sewer within Courtland Court, exceeding the allowable release rate.
- A temporary 315 mm diameter orifice is provided in MH47, controlling flows to a maximum release rate of 309 L/s at a ponding elevation of 143.14 m.
- The storage required to control flows to the target release rate is 64.8 m³, a total of 113.4 m³ of storage is provided within the storm sewer and underground structures at this ponding elevation.

Sanitary Servicing

- Eight (8) individual 125 mm diameter gravity sanitary service connections from the proposed 200 mm diameter sanitary sewer on Kingsley Road will service the 8 freehold townhomes which front Kingsley Road.
- A proposed 200 mm diameter sanitary service connection (MH97A) extending from the proposed 200 mm diameter sanitary sewer on Cortland Court to service Phase 1 and the future Phase 2 of the proposed rental building development.
- There will be sufficient capacity in the proposed Village A – Phase 1 external sanitary improvements to accommodate the proposed development.
- The Picton WPCP has existing uncommitted reserve capacity to accommodate the proposed development.

Water Supply and Distribution

- A proposed 200 mm diameter PVC watermain connection will be provided for the proposed Rental building from the proposed 300 mm diameter municipal watermain on Kingsley Road.
- Eight (8) proposed 19 mm diameter type ‘K’ copper water connections (one for each of the eight proposed townhomes fronting Kingsley Road) will be provided from the proposed 300 mm diameter municipal watermain on Kingsley Road.
- RA Engineering and DLW Engineering have prepared an assessment of the existing and proposed system and has determined there is sufficient capacity to service the proposed development upon the completion of the external watermain improvements, which are being constructed as part of the proposed Village A – Phase 1 development. This includes the proposed watermain on Kingsley Road and the upgrade to the existing fire pump in the BPS.
- The Picton WTP has existing uncommitted reserve capacity to accommodate the proposed development.

Utility Considerations

- Callidus Engineering, has been retained to prepare the lighting design and coordinate the utility (electrical, gas, telecom) requirements and connections for the proposed development.
- The utility design has been coordinated with the civil engineering design to ensure there are no conflicts.

Erosion and Sediment Control during Construction

- An erosion and sediment control plan has been prepared in accordance with the “Erosion and Sediment Control Guideline for Urban Construction” document (December 2019).

Respectfully Submitted:

SCS Consulting Group Ltd.



for: Ryan Brockie, P.Eng
rbrockie@scsconsultinggroup.com

Cosimo Costa, P.Eng
ccosta@scsconsultinggroup.com

P:\2365 Picton Airport - Tercot\Design\Reports\FSSR\Rental Unit\2026 07(Jul) 17- 2365B - Site Servicing and SWM Report.docx

Figures

Refer to figures attached under separate cover



Drawings

Refer to drawings attached under separate cover



Appendix A Site Plan

Refer to appendix attached under separate cover



Appendix B Background Information

Refer to appendix attached under separate cover



Appendix B1 Pre-Consultation Memo

Refer to appendix attached under separate cover



Appendix B2 Geotechnical Report

Refer to appendix attached under separate cover



Appendix B3 Topographic Survey

Refer to appendix attached under separate cover



Appendix B4 Village A SWM Report

Refer to appendix attached under separate cover



Appendix B6 Village A Functional Servicing and Stormwater Management Report (FSSR)

Refer to appendix attached under separate cover



Appendix B4 Village A Civil Design Drawings

Refer to appendix attached under separate cover



Appendix B5 Village A SWM Report

Refer to appendix attached under separate cover



Appendix B6 Village A Functional Servicing and Stormwater Management Report (FSSR)

Refer to appendix attached under separate cover



Appendix B7 Water and Wastewater Treatment Plant Uncommitted Reserve Capacity Report

Refer to appendix attached under separate cover



Appendix C Stormwater Management Calculations

RENTAL BUILDING MEASURED PERCENT IMPERVIOUS

Project Number: 2365B

Date: July 2026

Designer Initials: R.R.B.

Phase 1 - Interim Condition Weighted Imperviousness to Village A SWM Facility
(Refer to Drawing STRM-1 for interim drainage areas)

	Area (ha)	Impervious Area (ha)	Percent Impervious	A x I
Village A - Rental Bldg (Interim)	0.14	0.03	19%	0.03
	0.16	0.16	100%	0.16
	0.29	0.24	84%	0.24
	0.14	0.11	79%	0.11
	0.21	0.14	65%	0.14
	0.18	0.15	85%	0.15
	0.12	0.10	84%	0.10
	0.75	0.00	0%	0.00
Interim - Total	1.99	0.93	76%	0.93

Phase 1 & 2 - Ultimate Condition Weighted Imperviousness to Village A SWM Facility
(Refer to Drawing STRM-2 for ultimate drainage areas)

	Area (ha)	Impervious Area (ha)	Percent Impervious	A x I
Village A - Rental Building (Phase 1 - Ultimate)	0.14	0.03	19%	0.03
	0.16	0.16	100%	0.16
	0.29	0.24	84%	0.24
	0.14	0.11	79%	0.11
	0.23	0.15	65%	0.15
	0.24	0.20	85%	0.20
	0.16	0.13	84%	0.13
Phase 1 (Ultimate) Total	1.36	1.03	76%	1.03
Village A - Rental Building (Phase 2 - Ultimate)	0.93	0.82	88%	0.82
Total	2.29	3.81	81%	1.85

Catchment 201-203		Outlets to: Courtland Court	
	Runoff Coefficient	Area (ha)	Weighted Runoff Coefficient (100 Year)
201	0.37	0.14	0.03
	0.80	0.29	0.15
	0.76	0.14	0.07
	0.67	0.21	0.09
	0.80	0.18	0.09
	0.80	0.12	0.06
	0.71	1.08	0.89
202	0.90	0.16	0.08
203	0.20	0.75	0.09
TOTAL	0.54	1.99	0.67

INTERIM (PHASE 1) 100 YEAR RELEASE RATE FROM RENTAL BUILDING TO COURTLAND CRT (MH 47)

Project Number: 2365B
Date: July 2026
Designer Initials: R.R.B.

100 Year storm

IDF Parameters* $\left\{ \begin{array}{l} a = 43 \\ t = 17.94 \text{ min} \\ b = 0.00 \\ c = 0.68 \end{array} \right.$ (Tc at MH47 per SSDS, refer to **Appendix D**)

Runoff Coefficient: $\begin{array}{l} C1 = 0.67 \\ C2 = 0.00 \\ C3 = 0.00 \end{array}$

Allowable Release Rate Calculation				
Outlet	Area	time	Intensity	Flow
ID		t	$i=a/(t+b)^c$	$Q=CiA/360$
	ha	min	mm/hr	l/s
Courtland Court	1.990	17.94	97.49	360.5

* a,b,c's per Prince Edward County

INTERIM (PHASE 1) RENTAL BUILDING ONSITE CONTROL SUMMARY

Project Number: 2365B
Date: July 2026
Designer Initials: R.R.B.

Catchment ID	Runoff Coef.	Area (ha)	100 Year			Orifice Size (mm) ⁴	Orifice Release Rate (L/s)	Location of Orifice	Invert	VERTICAL/TUBE Control
			Release Rate (L/s) ²	Storage Required (m ³) ²	Storage Available (m ³) ³					
201-203	0.54	1.99	300.6	64.8	113.4	315	300.6	MH47	141.010	VERTICAL
Total		1.99	300.6	64.8	113.4	-	-	-	-	-

Courtland Court Allowable Release Rate 309.0 L/s
Courtland Court Proposed Release Rate 300.6 L/s

INTERIM (PHASE 1) 100 REQUIRED STORAGE VOLUME

Project Number: 2365B
Date: July 2026
Designer Initials: R.R.B.

Area ID: 201-203

Catchment II Area = **1.990** ha
 "C" = **0.67**
 AC= **1.3311** -
 Tc = **17.9** mins (Tc at MH47 per SSDS, refer to **Appendix D**)
Time Increment = **3.0** mins

Prince Edward
County 100 Year

Release Rate = **300.58** l/s
Max.Storage = **64.8** m³

a= 43
b= 0
c= 0.678

Time (min)	Rainfall Intensity (mm/hr)	Storm Runoff ¹ (l/s)	Runoff Volume (m ³)	Released Volume (m ³)	Storage Volume (m ³)
17.9	97.49	360.77	388.33	323.5	64.8
20.9	87.79	324.86	408.15	350.6	57.6
23.9	80.17	296.67	426.14	377.6	48.5
26.9	74.00	273.85	442.65	404.7	37.9
29.9	68.89	254.93	457.96	431.8	26.2
32.9	64.57	238.95	472.26	458.8	13.4
35.9	60.87	225.24	485.70	485.9	-0.2
38.9	57.65	213.32	498.40	512.9	-14.5
41.9	54.82	202.85	510.45	540.0	-29.5
44.9	52.31	193.57	521.94	567.0	-45.1
47.9	50.07	185.27	532.91	594.1	-61.2
50.9	48.05	177.80	543.43	621.1	-77.7
53.9	46.22	171.03	553.54	648.2	-94.6
56.9	44.55	164.87	563.27	675.2	-112.0
59.9	43.03	159.23	572.66	702.3	-129.6
62.9	41.63	154.04	581.73	729.3	-147.6
65.9	40.33	149.26	590.52	756.4	-165.9
68.9	39.14	144.82	599.04	783.4	-184.4
71.9	38.02	140.70	607.32	810.5	-203.2
74.9	36.98	136.86	615.36	837.5	-222.2
77.9	36.01	133.26	623.18	864.6	-241.4
80.9	35.10	129.89	630.81	891.6	-260.8
83.9	34.25	126.73	638.25	918.7	-280.4
86.9	33.44	123.75	645.50	945.7	-300.2

<<<<

Orifice Equation: $Q = C_d A (2gh)^{1/2}$

Orifice Diameter:	315	mm
Area:	0.078	m ²
g =	9.81	m/sec ²
C _d =	0.62	

Type of Control:	VERTICAL
Location:	MH47

Pipe Storage

Diameter (mm)	Area (m ²)	Length (m)	Volume (m ³)
250	0.049	144	7.1
375	0.110	78	8.6
600	0.283	88	24.9
Total Sewer Volume			40.6 m ³

MH Storage

	Diameter (mm)	Area (m ²)	Depth (m)	Volume (m ³)
CBMH84	1200	1.131	0.39	0.4
CBMH85	1200	1.131	0.82	0.9
CBMH86	1500	1.767	1.11	2.0
MH87	1500	1.767	1.74	3.1
MH88	1500	1.767	2.06	3.6
Total MH Volume				9.6

Total Volume	50.2 m ³
--------------	---------------------

Surface Storage

Ponding Elevation (m)	Area (m ²)	Volume (m ³)
143.14	0.045	63.14

Total Volume	113.4 m ³
--------------	----------------------

OVERLAND FLOW CALCULATIONS TO RENTAL BUILDING ENTEREANCE CULVERT

Project Number: 2365B

Date: July 2026

Designer Initials: R.B.

205			
	Runoff Coefficient	Area (ha)	Weighted Runoff Coefficient (5 Year)
Asphalt	0.90	0.27	0.64
Grass	0.25	0.11	0.07
TOTAL		0.38	0.71

205	Return Period	
	5 Year	
Area (ha)=	0.38	
Runoff Coeff. =	0.71	
T _c (min)=	17.00	
a =	26.4	
b =	0.00	
c =	0.677	
Intensity (mm/hr) =	62.00	
Runoff (m³/s) =	0.047	

Assume TC of 10 min and 210m flowing at 2m/s

*Area and Runoff coefficient per **Figure 4.2**

*IDF parameters per Prince Edward County

5 Year Flow (205)

$$Q_{5yr} \text{ (m}^3\text{/s)} = 0.047$$

100 Year Flow(205)

$$Q_{100yr} \text{ (m}^3\text{/s)} = 0.085$$

Culvert Calculator Report

Culvert - County Road 22

Solve For: Discharge

Culvert Summary			
Allowable HW Elevation	142.60 m	Headwater Depth/Height	2.21
Computed Headwater Elev.	142.60 m	Discharge	0.0867 m³/s
Inlet Control HW Elev.	142.48 m	Tailwater Elevation	142.10 m
Outlet Control HW Elev.	142.60 m	Control Type	Outlet Control

Grades			
Upstream Invert	142.15 m	Downstream Invert	142.00 m
Length	22.00 m	Constructed Slope	0.006818 m/m

Hydraulic Profile			
Profile	CompositeM2PressureProfile	Depth, Downstream	0.18 m
Slope Type	Mild	Normal Depth	N/A m
Flow Regime	Subcritical	Critical Depth	0.18 m
Velocity Downstream	1.45 m/s	Critical Slope	0.012558 m/m

Section			
Section Shape	Circular	Mannings Coefficient	0.012
Section Material	HDPE (Smooth Interior)	Span	0.20 m
Section Size	200 mm	Rise	0.20 m
Number Sections	2		

Outlet Control Properties			
Outlet Control HW Elev.	142.60 m	Upstream Velocity Head	0.09 m
Ke	0.20	Entrance Loss	0.02 m

Inlet Control Properties			
Inlet Control HW Elev.	142.48 m	Flow Control	Submerged
Inlet Type	Groove end projecting	Area Full	0.1 m²
K	0.00450	HDS 5 Chart	1
M	2.00000	HDS 5 Scale	3
C	0.03170	Equation Form	1
Y	0.69000		

RENTAL BUILDING MEASURED PERCENT IMPERVIOUS

Project Number: 2365B

Date: July 2026

Designer Initials: R.R.B.

Phase 1 - Interim Condition Weighted Imperviousness to Village A SWM Facility
(Refer to Drawing STRM-1 for interim drainage areas)

	Area (ha)	Impervious Area (ha)	Percent Impervious	A x I
Village A - Rental Bldg (Interim)	0.14	0.03	19%	0.03
	0.16	0.16	100%	0.16
	0.29	0.24	84%	0.24
	0.14	0.11	79%	0.11
	0.21	0.14	65%	0.14
	0.18	0.15	85%	0.15
	0.12	0.10	84%	0.10
	0.75	0.00	0%	0.00
Interim - Total	1.99	0.93	76%	0.93

Phase 1 & 2 - Ultimate Condition Weighted Imperviousness to Village A SWM Facility
(Refer to Drawing STRM-2 for ultimate drainage areas)

	Area (ha)	Impervious Area (ha)	Percent Impervious	A x I
Village A - Rental Building (Phase 1 - Ultimate)	0.14	0.03	19%	0.03
	0.16	0.16	100%	0.16
	0.29	0.24	84%	0.24
	0.14	0.11	79%	0.11
	0.23	0.15	65%	0.15
	0.24	0.20	85%	0.20
	0.16	0.13	84%	0.13
Phase 1 (Ultimate) Total	1.36	1.03	76%	1.03
Village A - Rental Building (Phase 2 - Ultimate)	0.93	0.82	88%	0.82
Total	2.29	3.81	81%	1.85

Catchment 201-203		Outlets to: Courtland Court	
	Runoff Coefficient	Area (ha)	Weighted Runoff Coefficient (100 Year)
201	0.37	0.14	0.03
	0.80	0.29	0.15
	0.76	0.14	0.07
	0.67	0.21	0.09
	0.80	0.18	0.09
	0.80	0.12	0.06
	0.71	1.08	0.89
202	0.90	0.16	0.08
203	0.20	0.75	0.09
TOTAL	0.54	1.99	0.67

INTERIM (PHASE 1) 100 YEAR RELEASE RATE FROM RENTAL BUILDING TO COURTLAND CRT (MH 47)

Project Number: 2365B
Date: July 2026
Designer Initials: R.R.B.

100 Year storm

IDF Parameters* $\left\{ \begin{array}{l} a = 43 \\ t = 17.94 \text{ min} \\ b = 0.00 \\ c = 0.68 \end{array} \right.$ (Tc at MH47 per SSDS, refer to **Appendix D**)

Runoff Coefficient: $\begin{array}{l} C1 = 0.67 \\ C2 = 0.00 \\ C3 = 0.00 \end{array}$

Allowable Release Rate Calculation				
Outlet	Area	time	Intensity	Flow
ID		t	$i=a/(t+b)^c$	$Q=CiA/360$
	ha	min	mm/hr	l/s
Courtland Court	1.990	17.94	97.49	360.5

* a,b,c's per Prince Edward County

INTERIM (PHASE 1) RENTAL BUILDING ONSITE CONTROL SUMMARY

Project Number: 2365B
Date: July 2026
Designer Initials: R.R.B.

Catchment ID	Runoff Coef.	Area (ha)	100 Year			Orifice Size (mm) ⁴	Orifice Release Rate (L/s)	Location of Orifice	Invert	VERTICAL/TUBE Control
			Release Rate (L/s) ²	Storage Required (m ³) ²	Storage Available (m ³) ³					
201-203	0.54	1.99	300.6	64.8	113.4	315	300.6	MH47	141.010	VERTICAL
Total		1.99	300.6	64.8	113.4	-	-	-	-	-

Courtland Court Allowable Release Rate 309.0 L/s
Courtland Court Proposed Release Rate 300.6 L/s

INTERIM (PHASE 1) 100 REQUIRED STORAGE VOLUME

Project Number: 2365B
Date: July 2026
Designer Initials: R.R.B.

Area ID: 201-203

Catchment II Area = **1.990** ha
 "C" = **0.67**
 AC= **1.3311** -
 Tc = **17.9** mins (Tc at MH47 per SSDS, refer to **Appendix D**)
Time Increment = **3.0** mins

Prince Edward
County 100 Year

Release Rate = **300.58** l/s
Max.Storage = **64.8** m³

a= 43
b= 0
c= 0.678

Time (min)	Rainfall Intensity (mm/hr)	Storm Runoff ¹ (l/s)	Runoff Volume (m ³)	Released Volume (m ³)	Storage Volume (m ³)
17.9	97.49	360.77	388.33	323.5	64.8
20.9	87.79	324.86	408.15	350.6	57.6
23.9	80.17	296.67	426.14	377.6	48.5
26.9	74.00	273.85	442.65	404.7	37.9
29.9	68.89	254.93	457.96	431.8	26.2
32.9	64.57	238.95	472.26	458.8	13.4
35.9	60.87	225.24	485.70	485.9	-0.2
38.9	57.65	213.32	498.40	512.9	-14.5
41.9	54.82	202.85	510.45	540.0	-29.5
44.9	52.31	193.57	521.94	567.0	-45.1
47.9	50.07	185.27	532.91	594.1	-61.2
50.9	48.05	177.80	543.43	621.1	-77.7
53.9	46.22	171.03	553.54	648.2	-94.6
56.9	44.55	164.87	563.27	675.2	-112.0
59.9	43.03	159.23	572.66	702.3	-129.6
62.9	41.63	154.04	581.73	729.3	-147.6
65.9	40.33	149.26	590.52	756.4	-165.9
68.9	39.14	144.82	599.04	783.4	-184.4
71.9	38.02	140.70	607.32	810.5	-203.2
74.9	36.98	136.86	615.36	837.5	-222.2
77.9	36.01	133.26	623.18	864.6	-241.4
80.9	35.10	129.89	630.81	891.6	-260.8
83.9	34.25	126.73	638.25	918.7	-280.4
86.9	33.44	123.75	645.50	945.7	-300.2

<<<<

Orifice Equation: $Q = C_d A (2gh)^{1/2}$

Orifice Diameter:	315	mm
Area:	0.078	m ²
g =	9.81	m/sec ²
C _d =	0.62	

Type of Control:	VERTICAL
Location:	MH47

Pipe Storage

Diameter (mm)	Area (m ²)	Length (m)	Volume (m ³)
250	0.049	144	7.1
375	0.110	78	8.6
600	0.283	88	24.9
Total Sewer Volume			40.6 m ³

MH Storage

	Diameter (mm)	Area (m ²)	Depth (m)	Volume (m ³)
CBMH84	1200	1.131	0.39	0.4
CBMH85	1200	1.131	0.82	0.9
CBMH86	1500	1.767	1.11	2.0
MH87	1500	1.767	1.74	3.1
MH88	1500	1.767	2.06	3.6
Total MH Volume				9.6

Total Volume	50.2 m ³
--------------	---------------------

Surface Storage

Ponding Elevation (m)	Area (m ²)	Volume (m ³)
143.14	0.045	63.14

Total Volume	113.4 m ³
--------------	----------------------

Culvert Calculator Report

Culvert - County Road 22

Solve For: Discharge

Culvert Summary			
Allowable HW Elevation	142.60 m	Headwater Depth/Height	2.21
Computed Headwater Elev.	142.60 m	Discharge	0.0867 m³/s
Inlet Control HW Elev.	142.48 m	Tailwater Elevation	142.10 m
Outlet Control HW Elev.	142.60 m	Control Type	Outlet Control
Grades			
Upstream Invert	142.15 m	Downstream Invert	142.00 m
Length	22.00 m	Constructed Slope	0.006818 m/m
Hydraulic Profile			
Profile	CompositeM2PressureProfile	Depth, Downstream	0.18 m
Slope Type	Mild	Normal Depth	N/A m
Flow Regime	Subcritical	Critical Depth	0.18 m
Velocity Downstream	1.45 m/s	Critical Slope	0.012558 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.012
Section Material	HDPE (Smooth Interior)	Span	0.20 m
Section Size	200 mm	Rise	0.20 m
Number Sections	2		
Outlet Control Properties			
Outlet Control HW Elev.	142.60 m	Upstream Velocity Head	0.09 m
Ke	0.20	Entrance Loss	0.02 m
Inlet Control Properties			
Inlet Control HW Elev.	142.48 m	Flow Control	Submerged
Inlet Type	Groove end projecting	Area Full	0.1 m²
K	0.00450	HDS 5 Chart	1
M	2.00000	HDS 5 Scale	3
C	0.03170	Equation Form	1
Y	0.69000		

OVERLAND FLOW CALCULATIONS TO RENTAL BUILDING ENTRANCE CULVERT

Project Number: 2365B
Date: July 2026
Designer Initials: R.B.

205			
	Runoff Coefficient	Area (ha)	Weighted Runoff Coefficient (5 Year)
Asphalt	0.90	0.27	0.64
Grass	0.25	0.11	0.07
TOTAL		0.38	0.71

205	Return Period
	5 Year
Area (ha)=	0.38
Runoff Coeff. =	0.71
T _c (min)=	17.00
a =	26.4
b =	0.00
c =	0.677
Intensity (mm/hr) =	62.00
Runoff (m ³ /s) =	0.047

Assume TC of 10 min and 210m flowing at 2m/s

*Area and Runoff coefficient per **Figure 4.2**

*IDF parameters per Prince Edward County

5 Year Flow (205)

$$Q_{5yr} \text{ (m}^3\text{/s)} = 0.047$$

100 Year Flow(205)

$$Q_{100yr} \text{ (m}^3\text{/s)} = 0.085$$

Appendix D Storm Sewer Servicing Calculations

Refer to appendix attached under separate cover



Appendix E Water Distribution Analysis

Refer to appendix attached under separate cover



Appendix E1 Fire Flow Memo

Refer to appendix attached under separate cover



Appendix E2 Picton Heights Booster Pump Station Upgrade Report

Refer to appendix attached under separate cover



Appendix E3 Watermain Hydraulic Analysis and Water Demands

Refer to appendix attached under separate cover

Appendix E4 Water Flow Meter Sizing and Selection Memorandum

Refer to appendix attached under separate cover

