

SERVICING AND STORMWATER MANAGEMENT REPORT

Prepared for:
Homes First Queen Elizabeth Residences

Medium Density Residential Development

35 Barker Street
Picton, ON K0K 2T0

SITEPLANTECH INC.
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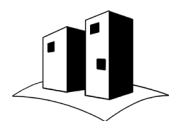
July 23, 2026
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t. 416-270-7515
w. www.siteplantech.com

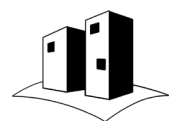


Table of Contents

1.0	INTRODUCTION	1
1.1	Purpose	1
1.2	Background Information	1
1.3	Site Description	2
1.4	Proposed Development.....	2
1.5	Easements and Land Conveyances	2
2.0	SERVICING TERMS OF REFERENCE AND METHODOLOGY	3
2.1	Terms of Reference	3
2.2	Methodology: Stormwater Management.....	3
2.3	Methodology: Sanitary Drainage.....	3
2.4	Methodology: Water Supply.....	4
3.0	STORMWATER MANAGEMENT	5
3.1	Existing Drainage System	5
3.2	Existing Runoff.....	6
3.3	Allowable Release Rate	6
3.4	Proposed Stormwater Management Strategy.....	7
3.5	Quantity Control	7
3.6	Quality Control.....	9
3.7	Water Balance.....	9
3.8	Erosion Control.....	10
3.9	External Drainage	10
3.10	Proposed Drainage System	10
3.11	Intake Protection Zone (IPZ) Considerations	10
4.0	SANITARY DRAINAGE	11
4.1	Existing Sanitary Drainage System.....	11
4.2	Existing Sanitary Flows.....	11
4.3	Proposed Sanitary Flows.....	11
4.4	Proposed Sanitary Connection.....	11



5.0	WATER SUPPLY	12
5.1	Existing System	12
5.2	Existing Water Demands.....	12
5.3	Proposed Water Supply Requirements	12
5.4	Proposed Water Connection	13
6.0	SITE GRADING	14
6.1	Existing Grades.....	14
6.2	Proposed Grades.....	14
7.0	EROSION AND SEDIMENT CONTROL	15
8.0	CONCLUSIONS AND RECOMMENDATIONS	16
8.1	STORMWATER MANAGEMENT.....	16
8.2	SANITARY DRAINAGE	16
8.3	WATER SUPPLY	16
8.4	SITE GRADING	16
8.5	EROSION AND SEDIMENT CONTROL	16



LIST OF TABLES

Table 1: Sanitary Flow Criteria

Table 2: Water Demand Criteria

Table 3: Groundwater Elevations

Table 4: Pre-Development Runoff

Table 5: Allowable Release Rate

Table 6: Post-Development Release Rates

Table 7: Effective TSS Removal Rate

Table 8: 100-Year Capture Points

Table 9: EXT-1 Runoff

Table 10: EXT-2 Runoff

APPENDICES

Appendix A – Background Information

Appendix B – Storm Data

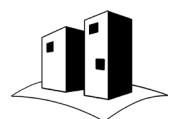
Appendix C – Sanitary Data

Appendix D – Water Data

Appendix E – Engineering Drawings

Submission History

Submission	Date	Issued For	Issued To
1	July 23, 2026	ZBA/SPA	Picton



1.0 INTRODUCTION

1.1 Purpose

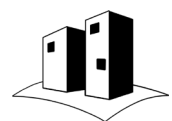
SITEPLANTECH was retained by Homes First Queen Elizabeth Residences Inc. to prepare a Functional Servicing Report, in support of an ZBA and Site Plan application, to investigate water supply, sanitary sewerage and storm drainage for a proposed development located at 35 Barker Street, Picton, Ontario.

The purpose of this report is to provide site specific information for the Town of Picton, Prince Edward County and Quinte Conservation's review with respect to the adequacy of the existing infrastructure to support the proposed development.

1.2 Background Information

The following documents were requested and made available to SITEPLANTECH for our review and forms the basis of this report:

- Keith Watson, OLS., Watson Land Surveyors Ltd. (2025, November 4), Plan of Survey Showing Topographical Information, Registered Plan 24, Town of Picton. (Project No. 15918-J-25). [Technical drawing].
- Stormwater Management Submission Guidelines, Quinte Conservation, dated May 2012.
- Bay of Quinte Remedial Action Plan Implementation Area Stormwater Management Design Guidelines, Revised March 2006.
- Design guidelines for Drinking-Water Systems, Ministry of the Environment (2008).
- Author Unknown, Jewell Engineering, (2026, April), Barker Street Grading Plan (Draft), (Project No. 250-5983), Drawing No. GP-02 [Technical drawing].
- Author Unknown, Jewell Engineering, (2026, March), Barker Street Plan and Profile Station 0+320 – STA.0+480 (Draft), (Project No. 250-5983), Drawing No. PP-03 [Technical drawing].
- Beth Johnson, HSPM Holdings Inc., Queen Elizabeth Residences – Site Plan, (Project No. 25-02). [Technical drawings].
- Stuart Baird, M.Eng., P.Eng., Geotechnical Investigation Report Proposed Residential Development – 35 Barker Street, Cambium (December 8, 2025)



1.3 Site Description

The subject site is approximately 18,152.7m² (1.81 Ha) and is currently occupied by a vacant school and is within a residential neighbourhood. The site is bounded by:

- Centre Street to the north;
- Barker Street to the east;
- An open field and residential housing to the south; and,
- Elm Street to the west.

1.4 Proposed Development

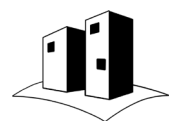
The proposed development is a medium density multi-building development that has been designed to integrate with the surrounding built form and the natural landscape. It consists of 4 low-rise buildings which front onto Barker Street, Centre Street, Elm Street and one building internal to the site fronting the planned driveway. The proposed development includes above-ground parking, a parkette, and amenity areas. In total, the proposed development will yield 209 residential units consisting of a mix of studios, one-, two-, and three- bedroom units. At-grade parking for 187 vehicles will be provided.

Please refer to the site plan and site statistics in **Appendix A** for additional information.

1.5 Easements and Land Conveyances

Although there are no unopened road allowances traversing the property, there is an easement registered on title for the property. This for the proposed development to the southwest that has a service easement on the west side of the site to provide service for sanitary and storm flows to Elm Street. Refer to topographic plan in **Appendix A** for additional details.

The Town or County have not requested any land conveyances and no easements will be necessary to develop the subject lands.



2.0 SERVICING TERMS OF REFERENCE AND METHODOLOGY

2.1 Terms of Reference

This report was prepared in accordance with the Town, County and Conservation Authority's terms of reference outlined in **Section 1.2** above.

2.2 Methodology: Stormwater Management

In accordance with the stormwater management guidelines, the modified rational method will be used to calculate runoff rates and target release rates from the site based on Intensity-Duration-Frequency (IDF) rainfall curves obtained from the Ministry of Transportation (MTO) database found in **Appendix B**.

We will provide a detailed account of the pre- and post-development conditions and comment on opportunities to reduce peak flows. Due to the extreme grading of the site and the need to minimize land disturbance, the proposed stormwater management requirements are summarized below:

- TSS removal: Long-term average of 80% TSS removal is required.
- Water quantity: The post-development 100-year storm shall be controlled to the 2-year pre-development rates for all impervious surfaces and captured areas while pervious surfaces for areas that cannot be captured will be left draining uncontrolled, such that post-development flows for the entire development do not exceed pre-development run-off conditions.
- Erosion control: Shall be designed as per the Erosion and Sedimentation Control Guidelines for Urban Construction (2006).

Detailed servicing and grading plans will be prepared based on the recommendations of this report.

2.3 Methodology: Sanitary Drainage

The sanitary sewage discharge from the site will be determined using sanitary flow rates that consider the land use and building statistics as supplied by the design team. The calculated values provide peak sanitary flow discharge that considers infiltration.

The proposed sanitary discharge flows from the site will be calculated based on the Prince Edward County's criteria shown in **Table 1** below.

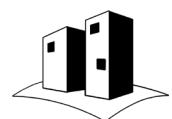


Table 1: Sanitary Flow Criteria

Use	Population	Flow
Studio / 1-BDRM	1.4	320 L/c/d
2-BDRM	2.1	320 L/c/d
3-BDRM	2.4	320 L/c/d

The proposed site generated flows will be calculated, and recommendations will be made to address capacity issues identified, if applicable.

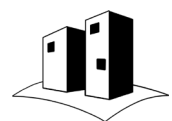
2.4 Methodology: Water Supply

The proposed domestic water demands from the site will be determined using the same criteria as outlined in **Table 1** above. Peak flows from the development will be calculated as per the MOECP Guidelines for Drinking Water, as per **Table 2** below.

Table 2: Water Demands Criteria

Criteria	P _f
Min Daily	0.84
Max Hour	0.90
Max Day	1.10

Pressure and flow testing will be conducted at hydrants within the vicinity of the site when it will be permissible to do so to obtain existing flows, residual and static pressure. Fire suppression calculations, in accordance with the Fire Underwriters Survey (FUS) Guidelines, will be undertaken to determine the minimum flow required at 140 KPa for fire protection, the results of which will be compared to the results of hydrant flow tests to confirm adequate supply.



3.0 STORMWATER MANAGEMENT

All calculations and figures pertaining to the information summarized in the following sections are found in **Appendix B**.

3.1 Existing Drainage System

The following storm sewer infrastructure is located within the vicinity of the subject site:

- A 300 mm diameter storm sewer located near the road centre line of Barker Street,
- A 150 mm diameter storm sewer on Elm Street
- A 675 mm diameter storm sewer on the south-west side of Centre Street;
- A ditch with box inlet culvert at the end of Elm Street, on the north side of the site.

All captured flows and surface drainage from the existing site drain toward the surrounding streets, where they ultimately outlet to the infrastructure on Centre Street..

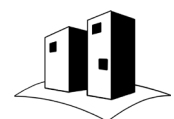
Based on the reviewed survey, the property receives external drainage from the northwest (Drainage ID EXT1). This drainage is directed away from the proposed development site and will continue to bypass the site under post-development conditions.

The proposed site will also receive external drainage from the proposed subdivision located west of the site, as identified in the *Functional Servicing and Stormwater Management Report for 340268 Ontario Limited Barker Street Subdivision Phase 1 (13T-11501)*, dated June 2025. This external drainage flow (Drainage ID EXT2) has been incorporated into the proposed site design and analysis. Refer to **Figure 201** for existing drainage conditions.

Boreholes were advanced as part of the geotechnical review of the soil conditions from which groundwater elevations were noted as indicated in **Table 3** below:

Table 3: Groundwater Elevations

BH No.	GW Elev. (MASL)	Ex. Ground Elev. (MASL)	Depth below grade (m)
BH101-25	88.31	94.71	6.4
BH102-25	89.40	93.60	4.5
BH103-25	-	94.85	-
BH104-25	88.65	95.24	6.6
BH105-25	-	92.36	-
BH106-25	-	92.50	-
BH107-25	-	94.63	-
BH108-25	-	92.76	-
BH109-25	-	94.70	-



3.2 Existing Runoff

The pre-development runoff conditions were calculated based on the County's and Quinte Conservation's criteria and will be used to determine net flow reduction from the site. The pre-development runoff from the site is summarized in **Table 4** below:

Table 4: Pre-Development Runoff

Return Period	Drainage Area (Ha)	Runoff C	Q (L/s)
ID 101 (To Elm Street)			
5-year	0.459	0.300	37.7
10-year	0.459	0.300	43.9
25-year	0.459	0.300	51.5
50-year	0.459	0.300	57.3
100-year	0.459	0.300	62.9
ID 102 (To Centre Street)			
5-year	1.200	0.645	212.2
10-year	1.200	0.645	246.8
25-year	1.200	0.645	289.7
50-year	1.200	0.645	322.1
100-year	1.200	0.645	353.7
ID 103 (To Barker Street)			
5-year	0.156	0.650	27.8
10-year	0.156	0.650	14.9
25-year	0.156	0.650	37.9
50-year	0.156	0.650	42.2
100-year	0.156	0.650	46.3
ID EXT2			
5-year	0.223	0.300	18.3
10-year	0.223	0.300	21.3
25-year	0.223	0.300	25.0
50-year	0.223	0.300	27.8
100-year	0.223	0.300	30.6

3.3 Allowable Release Rate

The release rate from all captured areas will be the 5-year return period with a calculated allowable release rate summarized in **Table 5** below:

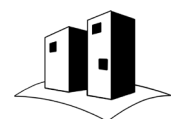


Table 5: Controlled Release Rate

Drainage ID	Area (Ha)	Runoff C	2-Yr Release Rate (L/s)
101	0.459	0.300	37.7
102	1.200	0.645	212.2
103	0.156	0.650	27.8
EXT2	0.223	0.300	18.3
Total			296.1

3.4 Proposed Stormwater Management Strategy

The post-development storm drainage will follow pre-development conditions in that the flow will continue to outlet to Centre Street.

Except for areas which cannot be captured within reasonable means, grading has been designed to be self-contained during the 100-year storm event. An emergency overland flow outlet via the access driveways, will be provided to limit surface ponding to a maximum of 0.30m and direct emergency flows to Elm Street and Barker Street.

All captured flows from the site will be directed to an underground stormwater management facility. Drainage from the underground storage chambers will drain by gravity to the lowest outlet spot for this site which is a double catchbasin manhole at the southwest corner of Centre Street and Barker Street. The on-site storm sewers leading to the outlet were sized to convey the 5-year release rate from the underground chambers. Whereas the on-site storm sewers upstream of the underground chambers were sized to convey the 100-year release rate.

3.5 Quantity Control

As shown in **Table 6** below, the 100-year post-development discharge rate from the subject development will be controlled such that the total release rate does not exceed the allowable target release rate. Refer to **Figure 202**.



Table 6: Post-Development Release Rates

Storm Event	Total Allow. Release Rate (L/s)	ID 210 Controlled Flow (L/s)¹	ID 220 Uncontrolled Flow (L/s)²	ID 211 Controlled Flow (L/s)	Proposed Site Flow (L/s)	Required Storage (m³)¹
2-Year	296.1	80.9	7.1	4.8	92.8	125.2
5-Year	296.1	116.3	9.4	6.8	132.5	161.1
10-Year	296.1	143.1	11.0	8.4	162.5	175.5
25-Year	296.1	183.2	14.2	10.3	207.7	227.5
50-Year	296.1	222.0	17.2	12.6	251.7	276.1
100-Year	296.1	258.3	19.7	14.5	292.4	325.8

Note: the sums outlined in the table above may not be exact due to significant digit rounding.

In total, 325.8 m³ of active storage is required to meet the allowable release rate this volume is split between drainage ID 210 and 211. Quantity controls for ID 210 will be provided by underground storage units consisting of 134 SC-800 chambers located below grade. The 2- through the 100-year storm event will controlled by a 370mm diameter tamper-proof orifice plate located at the outlet of the SWM chamber.

Quantity controls for ID 211 will be provided by underground storage units consisting of 12 SC-310 chambers. The 2- through the 100-year storm event will controlled by a 100mm diameter tamper-proof orifice plate located at the outlet of the SWM chamber. Approximately 12.6m³ is of active storage is required to meet the allowable release rate.

Details and sections of the SWM chamber, underground storage units and orifice controls are provided on **Plan 002** and **Plan 101**, found in **Appendix E**.

To protect the building against a complete system failure, the stormwater management chamber will be equipped with a perforated manhole lid accessible at grade to provide an emergency overland release point that also provides inspection and maintenance access to the SWM chamber. The site will be graded in such a way that overland flow relief (emergency) will be directed north to Centre Street. Refer to **Plan 401** for grading details.

¹ Includes ID EXT2 in ID 210 released rate

² Excludes EXT1 which bypasses the site



3.6 Quality Control

As per the MOE requirements, quality controls must achieve a minimum of 80% total suspended solids (TSS) removal. The development will mostly consist of rooftop and parking surfaces with perimeter controlled landscaped surfaces each having an effective removal rate as outlined in **Table 7** below:

Table 7: Effective TSS Removal Rate

Surface Type	Effective Removal Rate
Hardscaped/Asphalt	0%
Parkette /Landscape	50%
Roof	80%
Grassed areas	90%

Based on the Effective TSS removal calculations, the proposed development will achieve a net TSS removal of 43% for drainage areas 210, 211 and 220. It is therefore proposed to treat run-off from each drainage areas with an oil grit separator (model no. FD-10HC). This runoff will be treated by the OGS prior to entering municipal sewers such that the volume of water released from the site will have been treated.

Understanding that an OGS can only be credited with a maximum TSS removal of 50%, based on our calculations, the proposed quality treatment system will achieve an overall net TSS removal of 84% for drainage areas 210, 211 and 220. Refer to **Plan 101** for further information.

3.7 Water Balance

In addition to providing quantity control, the proposed underground storage system has been designed to provide water quality treatment through the retention and infiltration of the first 12.5 mm of runoff from the post-development impervious surfaces. The granular bedding beneath the underground storage chambers consists of 300 mm of clear stone with a void ratio of 40%, providing approximately 53.8 m³ of available storage within the granular base. This is based on the slight increase in impervious area associated with the proposed development (refer to the *Volume Control Calculations* in **Appendix B**). Runoff captured within the granular void space will infiltrate into the underlying native soils, promoting groundwater recharge while reducing the discharge of untreated runoff to the municipal storm sewer system. Although the post-development impervious area increases modestly, the incorporation of infiltration storage within the underground system ensures that the development will not adversely impact groundwater quantity or quality. By reducing runoff volumes, and controlling peak discharge rates, the proposed servicing design is not anticipated to adversely affect the quantity or quality of groundwater.



3.8 Erosion Control

Please refer to **Section 7.0** below for details related to the proposed temporary erosion and sedimentation controls to be implemented during construction.

3.9 External Drainage

The proposed development receives external drainage from areas beyond the southwestern side of the property due to the sloped terrain. There are 2 external drainage areas identified; drainage ID EXT1 and drainage ID EXT2, as noted on **Drawing 202** in **Appendix B**. The grading has been designed such that all external flows (ID EXT1) coming from lands to the northwest will be directed away from the proposed development site and will continue to bypass the site under post-development conditions. This external flow was established by DG Biddle & Associates in the Functional Servicing and Stormwater Management Report for 340268 Ontario Limited Barker Street Subdivision Phase 1 (13t-11501), Stormwater Management Report, dated June 2025.

The external flow from Area ID EXT2 as identified in the same aforementioned report, will be captured on-site and routed through Drainage Area ID 210.

3.10 Proposed Drainage System

It is proposed to outlet the proposed development to the lowest point of the site which is at the eastern corner of the property. A control manhole, providing inspection and access to the SWM infrastructure, will be installed near the property line.

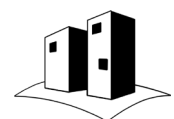
Refer to **Drawing 101** found in **Appendix E** for the details related to the service connection.

3.11 Intake Protection Zone (IPZ) Considerations

The subject property is located within Intake Protection Zone 2 (IPZ-2), as identified in the Quinte Region Source Water Protection Plan. Development within the IPZ is required to demonstrate that municipal drinking water sources will be protected through appropriate stormwater management and servicing design.

The proposed development incorporates stormwater quantity controls that limit post-development discharge rates to the allowable target release rates for all design storm events up to and including the 100-year storm through underground storage facilities and controlled outlet structures. This will thereby maintain the existing drainage pattern and minimize downstream hydrologic impacts.

Stormwater quality treatment is provided through the oil-grit separator (FD-10HC) servicing the proposed drainage areas achieving an overall Total Suspended Solids (TSS) removal efficiency of approximately 84%, exceeding the minimum requirement of 80%. These measures reduce



sediment and associated contaminant loading prior to discharge to the municipal storm sewer system.

Based on the proposed stormwater quantity and quality controls, the development is not anticipated to adversely affect municipal drinking water resources or conflict with the objectives of the Quinte Region Source Water Protection Plan. The proposed servicing and stormwater management design is therefore considered consistent with the applicable Intake Protection Zone policies.

4.0 SANITARY DRAINAGE

All calculations pertaining to the information summarized in the following sections are found in **Appendix C**.

4.1 Existing Sanitary Drainage System

The following sanitary sewer infrastructure is located within the vicinity of the subject site:

- An existing 300 mm diameter sanitary sewer on Elm Street;
- An existing 300 mm diameter sanitary sewer along Centre Street;
- An existing 300 mm diameter sanitary sewer on Barker Street.

4.2 Existing Sanitary Flows

The existing property is currently occupied by a vacant school and does not currently contribute to the local infrastructure.

4.3 Proposed Sanitary Flows

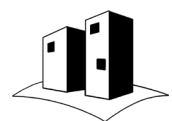
The proposed sanitary discharge flows from the site were calculated based on the criteria outlined in **Section 2.3**, the proposed building and site information. A total peak design flow of 7.7 L/s was calculated for the subject property.

4.4 Proposed Sanitary Connection

The sanitary effluent from the proposed development will be discharged by gravity.

All sanitary flow from the proposed development will outlet to the existing 300mm sanitary sewer on Centre Street. A 200 mm sanitary sewer service connection with a grade of 1.0% will be adequate to convey the calculated design flow of 7.7 L/s. This diameter and slope will ensure that the minimum self-cleaning velocity of 0.6 m/s is achieved. Connection at the municipal main will be made at an existing manhole, and a control/inspection manhole for the property will be placed at the property line.

Refer to **Drawing 101** found in **Appendix E** for the details related to the service connection.



5.0 WATER SUPPLY

All calculations pertaining to the information summarized in the following sections are found in **Appendix D**.

5.1 Existing System

The following water infrastructure is located within the vicinity of the subject site:

- An existing 200 mm diameter watermain located within the northwest boulevard of Barker Street. This watermain is proposed to be replaced by the County with a 200mm PVC watermain.
- An existing watermain located near the Centre Street centreline, the diameter of which is unknown.

Two hydrant flow tests were carried out within the vicinity of the site to determine flow and pressure conditions for each existing watermain. Both tests were carried out on October 9, 2025 by Prince Edward County.

The first hydrant flow test was performed on Barker Street. The test results indicate the watermain is operating at a static pressure of approximately 441 kPa (64 PSI) and that the available flow at 140 kPa (20 PSI) is approximately 5,353 L/min (1,414 USGPM).

The second hydrant flow test was performed on Centre Street. The results of this test indicate the watermain is operating at a static pressure of approximately 462 kPa (67 PSI), and that the available flow at 140 kPa (20 PSI) is approximately 9,948 L/min (2,628 USGPM).

Detailed reports of both tests are included in **Appendix D**.

5.2 Existing Water Demands

The existing property is currently occupied by a vacant school and does not currently have a demand on the local infrastructure.

5.3 Proposed Water Supply Requirements

The estimated water consumption was calculated as per the criteria outlined in **Section 2.4** above. The proposed average day domestic water consumption rate is estimated to be 1.2 L/s (maximum day demand of approximately 118,272 L/day).

Water Supply for Public Fire Protection calculations, as provided by the Fire Underwriters Survey (FUS), were undertaken to determine the minimum requirement to provide adequate fire suppression. According to our calculations, a minimum fire suppression flow of approximately 8,075 L/min (2,133 USGPM) at a pressure of 140 KPa (20 PSI) will be required for the subject development. According to the flow test referenced above, the Max Day + Fire Flow rate of



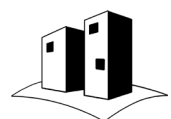
approximately 8,158 L/min (2,155 USGPM) is available at a pressure which exceeds the minimum FUS requirements.

The municipal water system therefore has adequate flow and pressure to satisfy the water demands of the proposed development.

5.4 Proposed Water Connection

The development will be serviced with a 200mm watermain and will connect to the existing 200mm watermain on Barker Street with a cut-in tee. Each building will be provided with domestic and fire service from this line as each building will be sprinklered. To ensure adequate fire coverage, two (2) private hydrants are proposed on site and will be located along the fire route.

Refer to **Drawing 101** found in **Appendix E** for additional details.



6.0 SITE GRADING

6.1 Existing Grades

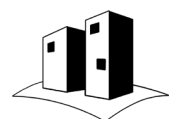
The existing site grades generally slope from south to north, directing overland drainage toward Centre Street. Along the school frontage on Barker Street, the grades slope toward the roadway, and the existing elevation differences necessitate the use of a concrete retaining wall. Refer to **Figure 201** found in **Appendix B**. The topography of the surrounding areas suggests that the site receives drainage from external sources located to the south. Refer to **Section 3.9**. The site has an approximate 4.2m grade difference from high to low point.

6.2 Proposed Grades

Based on the development concept and the review of the perimeter site grades, the finished floor elevation of the different proposed buildings will vary. Buildings A and B will have a finished floor elevation (FFE) of 94.25, Building C will have an FFE of 95.30 and Building D will have an FFE of 94.75.

The proposed finished floor elevations and grading of the site perimeter will be compatible with the surrounding developments. Perimeter grades will be designed to produce grades in the range of 2.0% to 5.0% towards the municipal right-of-ways. Existing grades will be met at the bottom of curb as the boulevards will be reconstructed. Proposed bottom of curb elevations along Barker Street, which is to be reconstructed by others, will also be accommodated within the site grading design. To transition to existing grades along the northern property line, a maximum 2:1 slope is proposed, while a retaining wall is required along the southern portion of the site to address the grade differential.

The development of this site and will not adversely impact adjacent lands. Please refer to **Drawing 401** found in **Appendix E** for additional information.



7.0 EROSION AND SEDIMENT CONTROL

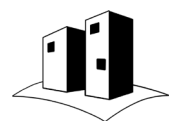
To ensure stormwater runoff during the construction phase does not transport sediment to the existing municipal infrastructure, the following measures will be implemented throughout the construction period:

- Temporary catch basin sediment control devices are proposed on Elm Street, Centre Street and Barker Street.
- Temporary sediment control fencing will be erected around the site perimeter.
- Temporary construction access (mud mat) will be built at the construction entrance currently proposed from Barker Street.
- All proposed erosion and sedimentation control measures shall be inspected promptly after every storm event and shall be repaired or replaced if/where damaged.

As a measure of best management practice, the following shall be implemented as part of the construction activities:

- All precipitation accumulated within the site excavation during the duration of construction shall be dealt with as part of the on-site short-term groundwater dewatering program.
- All waste material, including any hazardous contaminated excess soils, shall be removed and disposed of off-site by the owner in accordance with the Ministry of the Environment, Conservation and Parks (MECP) regulations and all other applicable statutory requirements.

The above measures will be designed and constructed in accordance with the "Erosion and Sediment Control Guideline for Urban Construction" document (December 2019). These measures, as well as any additional information pertaining to ESC Controls, are detailed on **Drawing 601** found in **Appendix F**. All reasonable measures will be taken to ensure sediment loading to the adjacent properties and municipal right-of-way is minimized both during and following construction.



8.0 CONCLUSIONS AND RECOMMENDATIONS

This report is to be read in conjunction with the application submission material for the project proposal known as the Queen Elizabeth Residences development. We conclude and recommend the following:

8.1 STORMWATER MANAGEMENT

Peak runoff rates for the proposed development were designed to be less than or equal to the existing condition by implementing onsite SWM controls. Stormwater storage for each drainage area will be implemented to achieve this and will be provided by on-site storage and orifice plates. A total storage volume of 325.8m³ is required to meet quantity controls.

Quality controls will be provided by an oil-grit separator and an overall TSS removal efficiency of approximately 84% will be achieved.

The proposed servicing and stormwater management design is therefore considered consistent with the applicable Intake Protection Zone policies.

8.2 SANITARY DRAINAGE

The sanitary discharge from the proposed development will be directed to the existing infrastructure on Barker Street. The existing infrastructure has adequate capacity to safely convey effluent from the proposed development to the sanitary sewer on Barker Street.

8.3 WATER SUPPLY

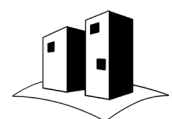
The existing 200mm watermain on Barker Street will provide service to the proposed development. According to the hydrant flow test, the municipal infrastructure is adequate to support the Max Day + Fire Flow from the proposed development.

8.4 SITE GRADING

The proposed grading is compatible with existing elevations at the property limits.

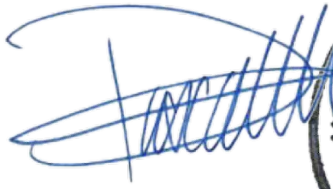
8.5 EROSION AND SEDIMENT CONTROL

ESC measures were designed as per the "Erosion and Sediment Control Guideline for Urban Construction" document (December 2019). Provided that these measures are well maintained during construction, these will be adequate to keep sediment from entering the municipal infrastructure during construction.



Respectfully submitted,

SITEPLANTECH INC.



Pascal Monat, P.Eng.
Principal

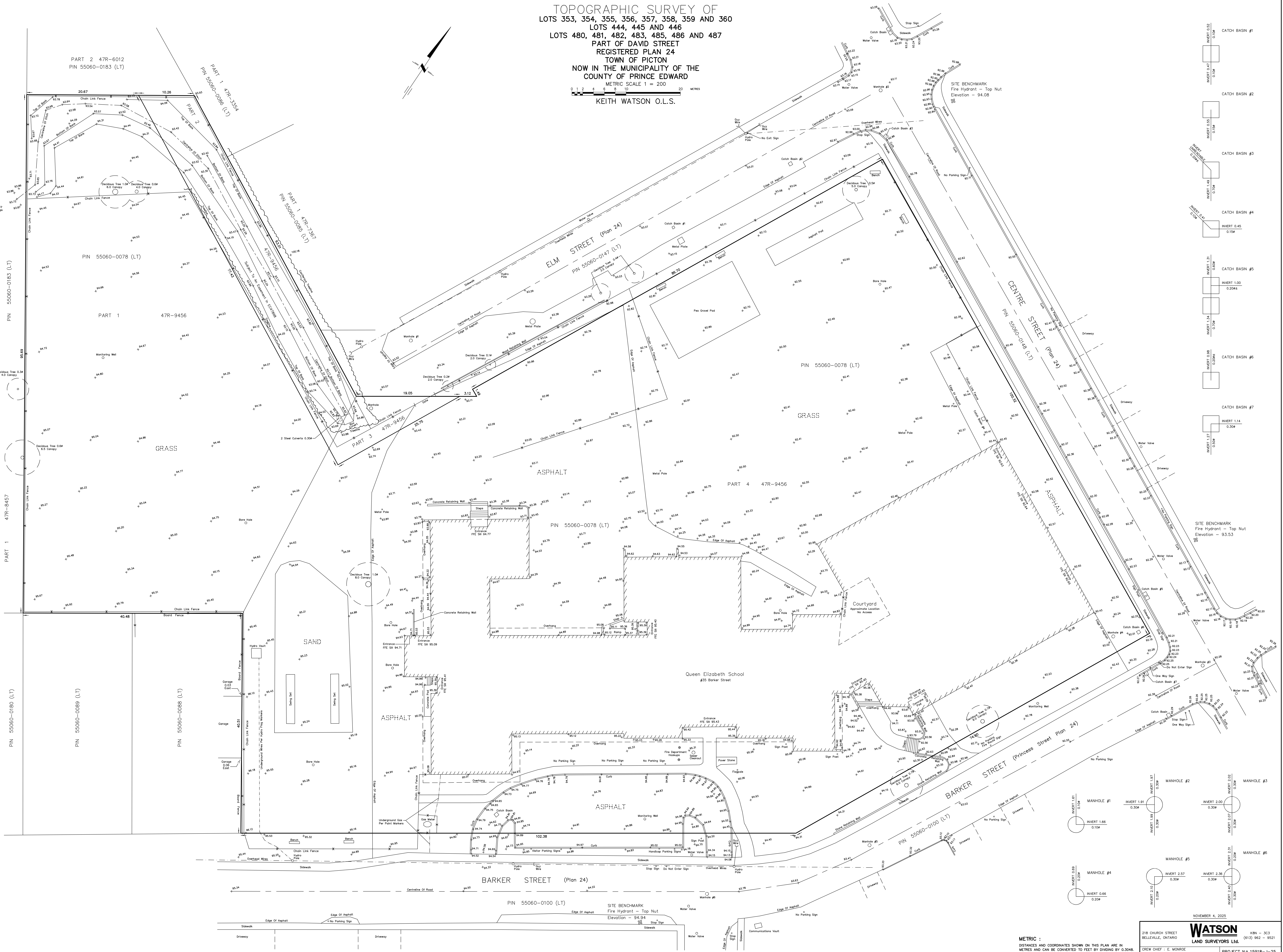
P:\24-017 - 35 Barker St. - Picton\Reports and Drawings\Reports\FSR\24-017 - FSR Current.docx



Appendix A

Background Information

TOPOGRAPHIC SURVEY OF
LOTS 353, 354, 355, 356, 357, 358, 359 AND 360
LOTS 444, 445 AND 446
LOTS 480, 481, 482, 483, 485, 486 AND 487
PART OF DAVID STREET
REGISTERED PLAN 24
TOWN OF PICTON
NOW IN THE MUNICIPALITY OF THE
COUNTY OF PRINCE EDWARD
METRIC SCALE 1 = 200
KEITH WATSON O.L.S.



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

CREW CHIEF : E. MONROE
DRAFTED BY : K. COLE

NOVEMBER 4, 2025
218 CHURCH STREET
BELLEVILLE, ONTARIO
WATSON
LAND SURVEYORS LTD.
KBN - 3C3
(613) 962 - 9521
PROJECT N° 15918-J-25

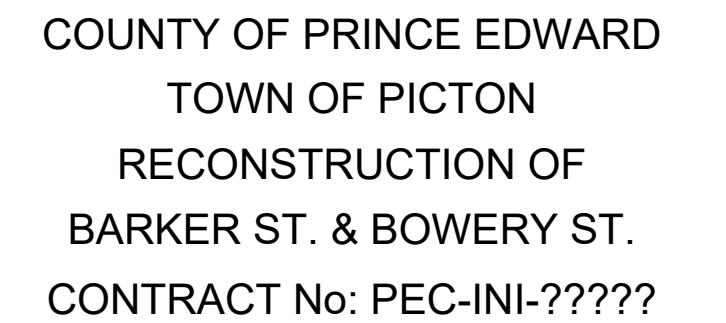
QUEEN ELIZABETH SCHOOL



**** DRAWINGS ARE NOT TO BE SCALED ****

GENERAL CONSTRUCTION NOTES:

<u>SITE</u>	
-	ALL EXISTING ROAD SIGNAGE TO BE REMOVED AND REINSTATED



CHECKED BY: PS SCALE: HORIZONTAL - 1:250
VERTICAL - 1:50
APPROVED BY: PS CONTRACT NO: PEC-INI-????? DRAWING NO: PP-03

GENERAL NOTES:

- ALL INFORMATION TO BE VERIFIED ON SITE PRIOR TO COMMENCING ANY WORK. ANY DISCREPANCY IS TO BE REPORTED TO THE CONSULTANT IMMEDIATELY.
- ALL UTILITY LOCATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE. THE CONTRACTOR SHALL CONDUCT A UTILITY LOCATING SURVEY AND ASSUME ALL LIABILITY FOR DAMAGE TO ALL UTILITIES.
- EXCLUDING THE BENCHMARK AND DESCRIPTION PROVIDED FOR THIS PROJECT, NO OTHER ELEVATIONS ARE TO BE USED AS A REFERENCE ELEVATION FOR ANY PURPOSE.

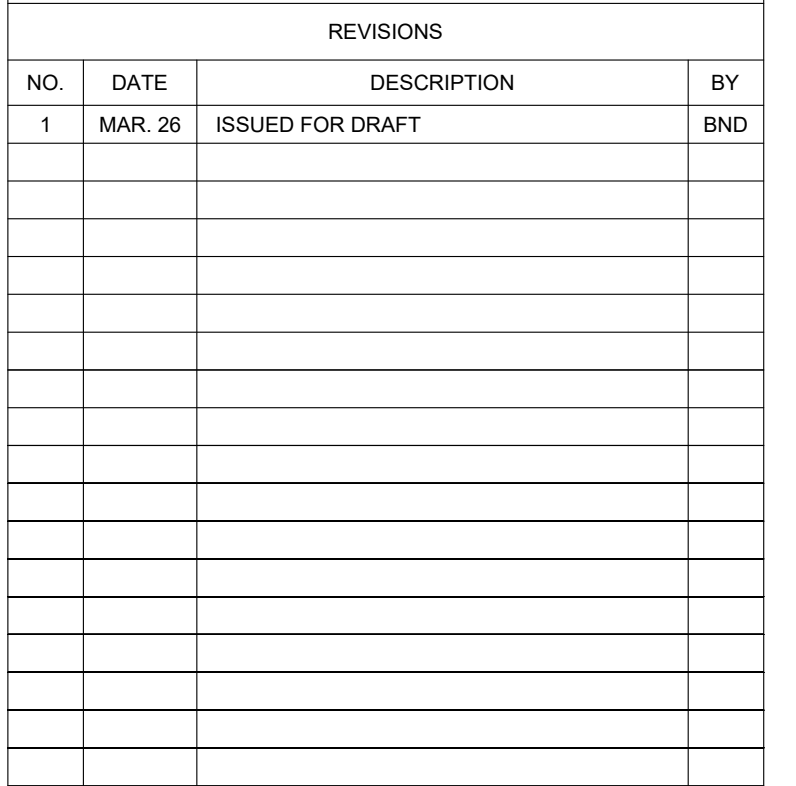
METRIC NOTE:

- ALL DIMENSIONS SHOWN ARE IN METERS OR MILLIMETERS, UNLESS OTHERWISE NOTED.

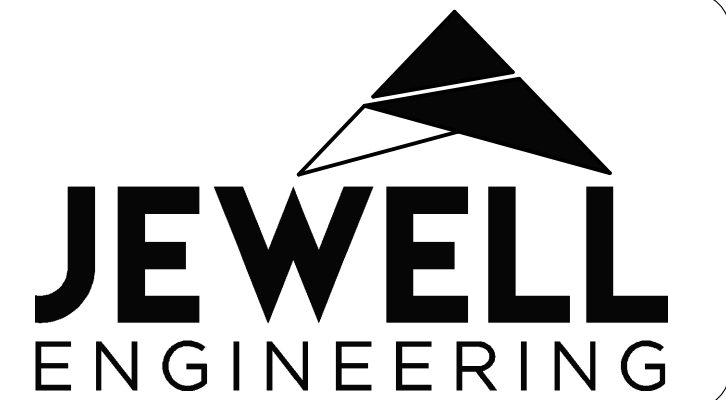
GEOMETRIC NOTE:

- ALL SURVEY DATA SHOWN ON THIS DRAWING WAS RECORDED USING REAL-TIME KINETIC (RTK) GPS OBSERVATIONS IN REFERENCE TO UTM 18 NORTH COORDINATE SYSTEM.
- ELEVATIONS ARE IN REFERENCE TO LOCAL DATUM NAD83 - GEODESIC MODEL HTX 2. UNLESS OTHERWISE NOTED.

**** DRAWINGS ARE NOT TO BE SCALED ****



DRAFT



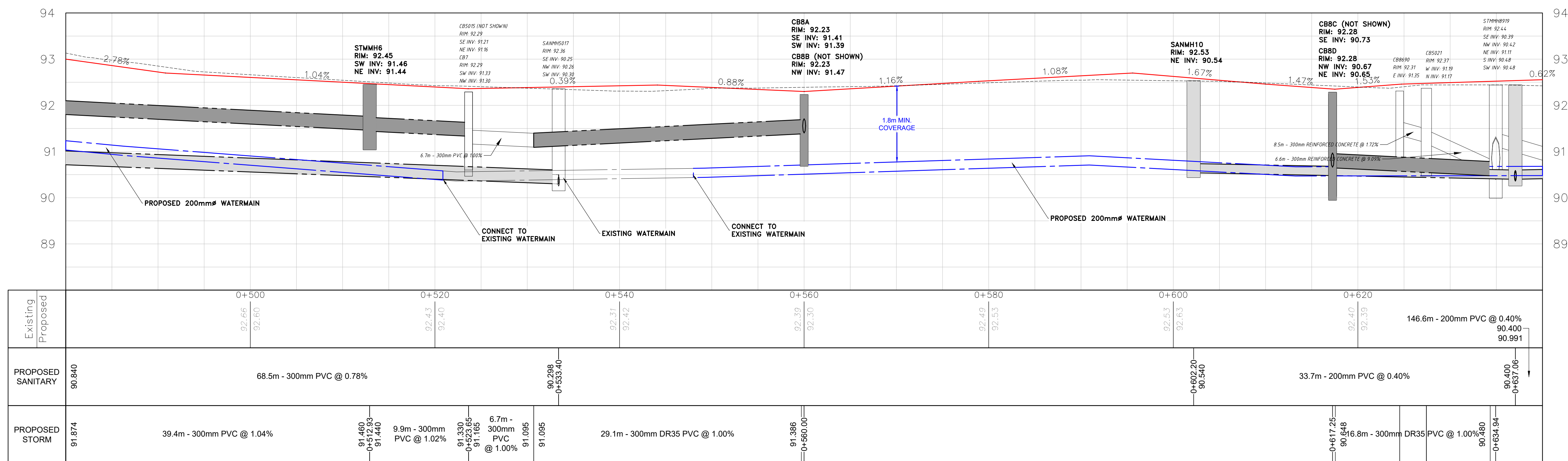
BARKER STREET
PLAN AND PROFILE
ON: 0+480 - STATION: 0+640

DRAWN BY: BND PROJECT NO: 250-5983

DESIGNED BY: DATE: MARCH 2026

CHECKED BY: SCALE: PS HORIZONTAL - 1:250
VERTICAL - 1:50

APPROVED BY: CONTRACT NO: DRAWING NO: PS PEC-INI-????? PP-04



Queen Elizabeth School



PAUL / STREET



GENERAL NOTES:

ALL INFORMATION TO BE VERIFIED ON SITE PRIOR TO COMMENCING ANY WORK. ANY DISCREPANCIES ARE TO BE REPORTED TO THE CONSULTANT IMMEDIATELY.

ALL UTILITY LOCATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY THE EXISTENCE OF UTILITIES ON SITE AND ASSUME ALL LIABILITY FOR DAMAGE TO ALL UTILITIES.

EXCLUDED FROM THE BENCHMARK AND DESCRIPTION PROVIDED FOR THIS PROJECT: NO OTHER ELEVATIONS ARE TO BE USED AS A REFERENCE ELEVATION FOR ANY PURPOSE.

METRIC NOTE:

ALL DIMENSIONS SHOWN ARE IN METERS OR MILLIMETERS, UNLESS OTHERWISE NOTED.

GEOMETRIC NOTE:

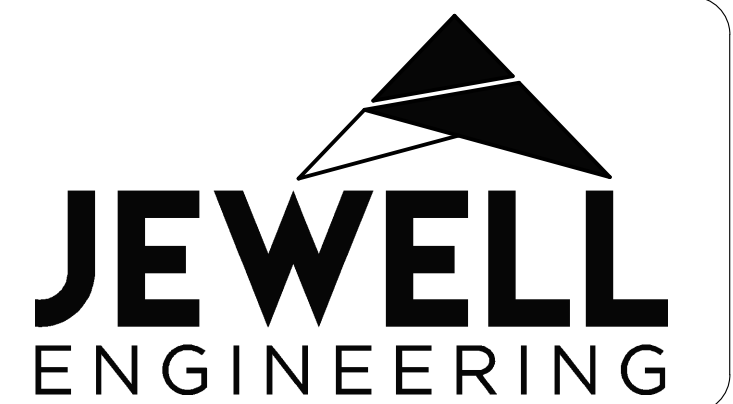
ALL SURVEY DATA SHOWN ON THIS DRAWING WAS RECORDED USING REAL-TIME KINETIC (RTK) GPS OBSERVATIONS IN REFERENCE TO UTM IN NORTH COORDINATE SYSTEM.

ALL ELEVATIONS ARE IN REFERENCE TO LOCAL DATUM NAD83 - GEODETIC MODEL HT, 3, UNLESS OTHERWISE DESCRIBED OTHERWISE.

**** DRAWINGS ARE NOT TO BE SCALED ****

[illegible]

DRAFT



COUNTY OF PRINCE EDWARD
TOWN OF PICTON
RECONSTRUCTION OF
BARKER ST. & BOWERY ST.
CONTRACT No: PEC-INI-?????

BARKER STREET
GRADING PLAN
STATION: 0+320 - STATION: 0+640

DRAWN BY: BND	PROJECT NO: 250-5983
DESIGNED BY: BND	DATE: APRIL 2026
CHECKED BY: PS	SCALE: HORIZONTAL - 1:250 VERTICAL - N/A
APPROVED BY: PS	CONTRACT NO: PEC-INI-?????
	DRAWING NO: GP-02

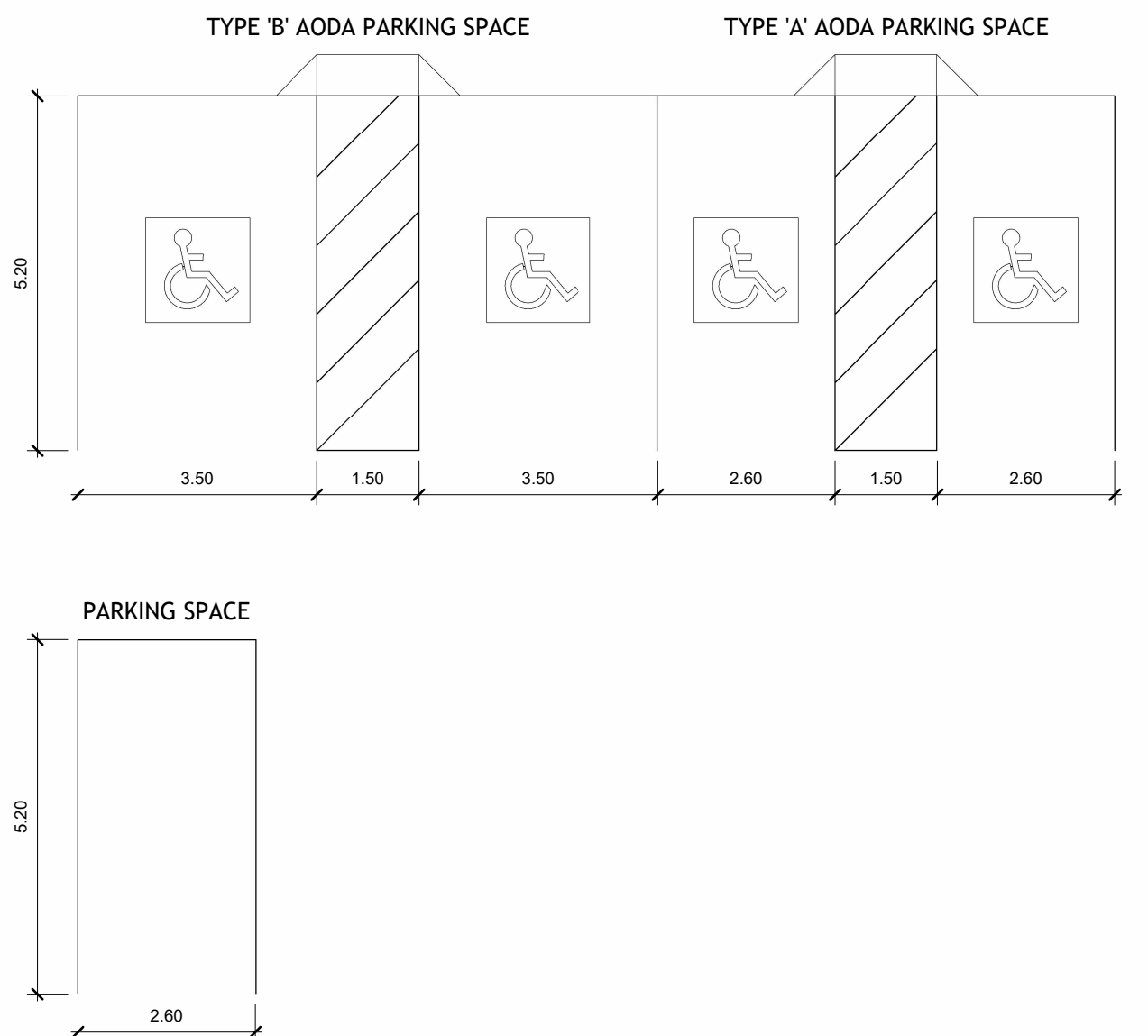
QUEEN ELIZABETH RESIDENCES SITE STATISTICS

SITE AREA		18 125.78 m ²	4.48 Acres	1.81 Ha
ORIGINAL		233.35 m ²	0.06 Acres	0.02 Ha
TURNING CIRCLE		17 882.41 m ²	4.12 Acres	1.79 Ha
FINAL AREA				
G.P.A.		4 983.95 m ²		
BDG A		2 507.02 m ²		
RESIDENTIAL		1 810.34 m ²		
HUB		2 284.57 m ²		
BDG B		3 126.47 m ²		
BDG C		4 958.58 m ²		
BDG D		16 676.33 m ²		
TOTAL				
F.S.I.		0.88		
COVERAGE		2 007.78 m ²		
BDG A		1 136.40 m ²		
BDG B		1 076.19 m ²		
BDG C		524.19 m ²	26.75%	
TOTAL		5 144.51 m ²		
UNIT COUNT				
BDG A		STUDIO 1 BR 1 BR AFF 1 BR/L 2 BR 2 BR AFF 3 BR TOTAL		
BDG B		9 20 0 3 14 1 3 42		
BDG C		2 25 0 2 12 0 2 46		
BDG D		38 20 8 4 2 0 0 55		
TOTAL		47 68 9 13 42 3 7 289		
DENSITY		116.81 units/ha		
HEIGHT				
BDG A		4 STOREYS		
BDG B		3 STOREYS		
BDG C		3 STOREYS		
BDG D		5 STOREYS		
LANDSCAPING				
PARKETTE		1 206.95 m ²		
COMMUNITY GARDEN		692.02 m ²		
GREENHOUSE			16.61%	
TOTAL		1 898.97 m ²		
HARDSCAPE				
ROAD/FARKING		6 188.72 m ²		
SIDEWALK		1 081.68 m ²		
PATIO		7 276.38 m ²	46.63%	
TOTAL				
AMENITY				
INDOOR		REQUIRED PROVIDED		
BDG A		2.00 84.00 m ² /unit 133.72 m ² 3.18 m ² /unit		
BDG B		82.00 94.00 m ² 2.38 m ² /unit		
BDG C		92.00 87.9 m ² 1.91 m ² /unit		
TOTAL		268.00 315.65 m ² 2.36 m ² /unit		
BDG D		185.00 316.91 m ² 4.15 m ² /unit		
OUTDOOR		REQUIRED PROVIDED		
BDG A		4.00 m ² /unit 836.00 m ²		
TOTAL		7.77 m ² /unit 1 622.82 m ²		
PARKING		REQ. AODA TOTAL		
ON SITE		167 20 187		
ELIZABETH STREET		22 22		
ON STREET		25 25		
PARKING ALLOCATION				
RESIDENT		153		
BDG A		37 0.88 spaces/unit		
BDG B		40 0.88 spaces/unit		
BDG C		40 0.88 spaces/unit		
BDG D		38 0.92 spaces/unit NB SENIORS FOCUSED BUILDING		
VISITOR		21 0.10 spaces/unit		
HUB		11 1.00 spaces/unit		
BICYCLE STORAGE				
SHORT TERM		116 0.58 spaces/unit		
LONG TERM		26 0.12 spaces/unit		
BDG A		26 0.12 spaces/unit		
BDG B		26 0.12 spaces/unit		
BDG C		26 0.12 spaces/unit		
BDG D		34 0.45 spaces/unit NB SENIORS FOCUSED BUILDING		
ABBREVIATIONS				
1 BR		1 BEDROOM UNIT		
1 BR/L		1 BEDROOM LARGE UNIT		
2 BR		2 BEDROOM UNIT		
3 BR		3 BEDROOM UNIT		
BF		BARRIER FREE		
AFF		ACCESSIBLE		
AODA		ACCESSIBILITY FOR ONTARIANS WITH DISABILITIES ACT		



- NOTES
- HYDRO POLE
 - HYDRO POLE TO BE RELOCATED
 - MAN HOLE
 - CATCH BASIN
 - PRIMARY ENTRANCE
 - SECONDARY ENTRANCE
 - FIRE EXIT
 - LANDSCAPE EXCLUSION ZONE

PARKING SPACE STANDARDS



- THIS DRAWING IS THE PROPERTY OF THE DESIGNER AND MAY NOT BE USED IN WHOLE OR IN PART FOR ANY PROJECT OTHER THAN THAT DESIGNATED HEREIN.
- DO NOT SCALE DRAWINGS.
- CONTRACTOR TO VERIFY JOB SITE DRAWING DIMENSIONS AND CONDITIONS AND REPORT ANY AND ALL DISCREPANCIES TO THE DESIGNER PRIOR TO CONSTRUCTION.
- ALL WORK MUST CONFORM TO THE LATEST LOCAL BUILDING CODE, LOCAL BY-LAWS AND WITHIN.
- THESE DRAWINGS ARE PROTECTED BY COPYRIGHT.

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Revisions		
No.	Description	Date

Issued		
No.	Description	Date

HSPM
HOLDINGS INC.
51 OAK AVENUE RICHMOND HILL ON L4C 6R5
BETH@HSPMHOLDINGS.COM

Homes First Queen Elizabeth
Residences

Client

Queen Elizabeth
Residences

Project name

Site Plan

Sheet name

Project number 25-02

Date Issue Date

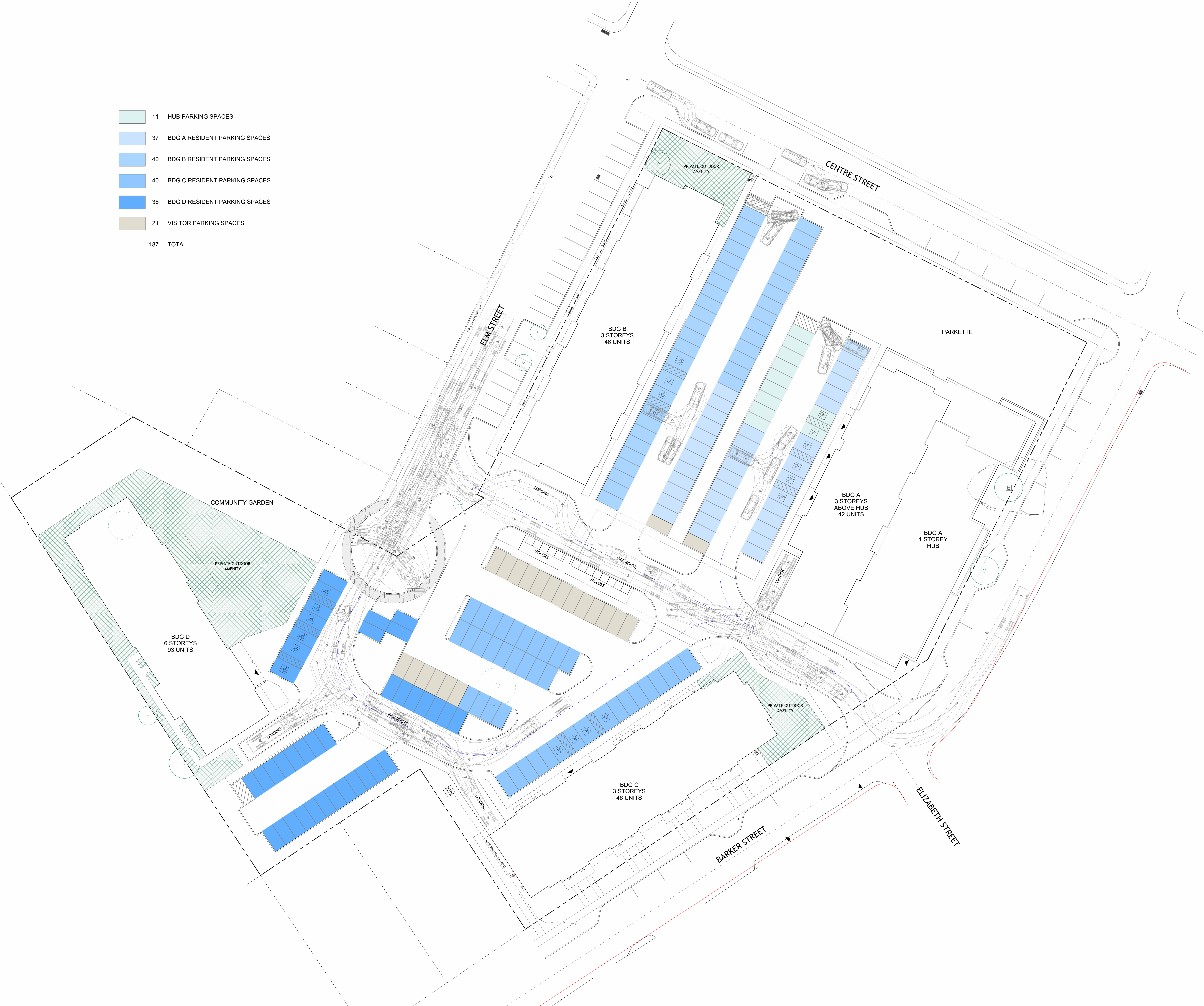
Drawn by HSPM

Checked by HSPM

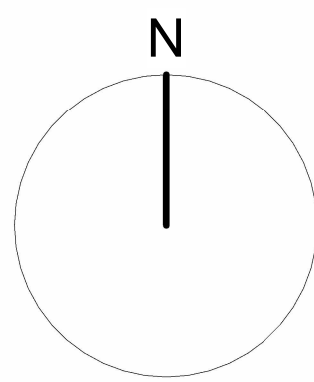
Rev

Dwg No. A100

Scale As indicated



- 11 HUB PARKING SPACES
- 37 BDG A RESIDENT PARKING SPACES
- 40 BDG B RESIDENT PARKING SPACES
- 40 BDG C RESIDENT PARKING SPACES
- 38 BDG D RESIDENT PARKING SPACES
- 21 VISITOR PARKING SPACES
- 187 TOTAL



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2. DO NOT SCALE DRAWINGS.
3. CONTRACTOR TO VERIFY JOB SITE, DRAWING DIMENSIONS AND CONDITIONS AND REPORT ANY AND ALL DISCREPANCIES TO THE DESIGNER PRIOR TO CONSTRUCTION.
4. ALL WORK MUST CONFORM TO THE LATEST LOCAL BUILDING CODE, LOCAL BY-LAW AND ZEMA-96.
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Revisions		
No.	Description	Date

Issued		
No.	Description	Date

HSPM
HOLDINGS INC.
51 OAK AVENUE RICHMOND HILL ON L4C 6R5
BETH@HSPMHOLDINGS.COM

Homes First Queen Elizabeth Residences

Client

Queen Elizabeth Residences

Project name

Parking Plan & Vehicular Movement Plan

Sheet name

Project number 25-02

Date Issue Date

Drawn by HSPM

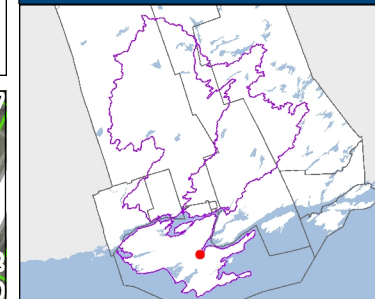
Checked by HSPM

Rev

Dwg No. A100.1

Scale 1 : 250

Key Map



Legend

- Conceptual Regulated Area*
- Assessment Parcel
- Lot Line
- Quinte Conservation Jurisdiction
- Lower and Single Tier Municipality
- Watercourse

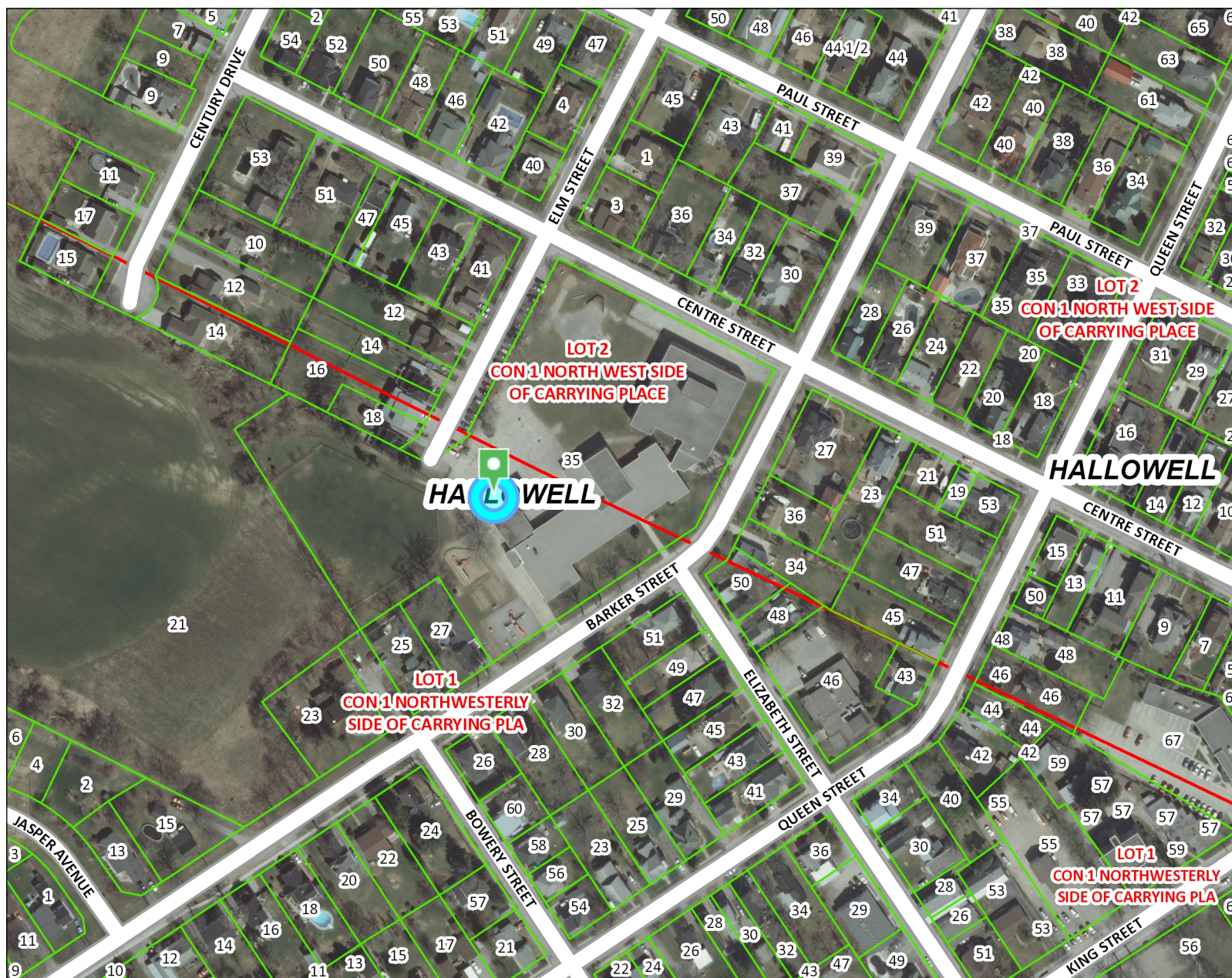
*Conceptual Regulated Area: The Regulated Area includes one or more of the following hazards: Great Lakes, Inland Lakes, Watercourses, Wetlands, Floodplains, Unstable Bedrock, Dynamic Beaches and Areas Subject to Erosion. Development activity is prohibited in these areas without a permit from Quinte Conservation.

Air Photo Capture Year(s):

2008

Notes

Note: As per Sec. 4. (5) of O. Reg. 41/24, in case of conflict regarding the boundaries of the areas where development activities are prohibited under paragraph 2 of subsection 21 (1) of the Conservation Authorities Act, the description of those areas in that paragraph and in section 2 of this Regulation prevail over the depiction of the areas in the maps referred to in subsection (1) of this section.



127.0 0 63.50 127.0 Meters

Projection: NAD_1983_UTM_Zone_18N
Generated: May 13, 2026 @ 5:25 PM

1: 2,500
Original Document: 8.5" x 11"



Moirs River, Napanee Region and Prince Edward Region Watersheds, RR2 2061 Old Highway 2, Belleville ON K8N 4Z2.
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Appendix B

Storm Data



EXT1 9.06
0.311

EXTERNAL FLOW AS PER DG BIDDLE & ASSOCIATES, FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT REPORT FOR 3402/8 ONTARIO LIMITED BARKER STREET SUBDIVISION PHASE 1 (13-11501), STORMWATER MANAGEMENT REPORT, DATED JUNE 2025

EXT2 0.223
0.30

EXTERNAL DRAINAGE AREA AS PER DG BIDDLE & ASSOCIATES, BARKER STREET SUBDIVISION (13-11-901), STORM SEWER DRAINAGE SCHEME, PLAN D-2, DATED JUNE 4 2025

102 1.200
0.65

103 0.156
0.65

101 0.459
0.30



LOCATION PLAN
N.T.S.

LEGEND

EXT2 0.223
0.00

TOWN OF PICTON
PRINCE EDWARD COUNTY

TOWN FILE No.:	COUNTY FILE No.:
---	---

SURVEY INFO.
WATSON LAND SURVEYORS
218 CHURCH ST.
BELLVILLE, ON
K8N 3C3
PHONE: (416) 962-9921

BENCHMARK

SITE PLAN INFO.
HSPH HOLDINGS INC.
50 ST. CLEMENTS AVE.
RICHMOND HILL, ON
L4C 0S5

1	ISSUED FOR RZA & SPA	07/07/26	LPH
NO.	ISSUE	WHY/WHY	BY

SITEPLANTECH INC.
50 ST. CLEMENTS AVE.
TORONTO, ON M4B 1G9
PHONE: (416) 270-7515

HOMES FIRST QUEEN ELIZABETH
RESIDENCES
35 BARKER STREET, PICTON

PRE-DEVELOPMENT
DRAINAGE AREA PLAN

PROJECT No. 24-017
DRAWING: 201

**PRE-DEVELOPMENT
RUNOFF COEFFICIENT**

Drainage Area 101 (To Elm St.)

Surface Type	C	A (Ha)	A*C
Grass	0.30	0.459	0.138
Composite C		0.459	0.300

Drainage Area 102 (To Centre St.)

Surface Type	C	A (Ha)	A*C
Asphalt	0.90	0.324	0.292
Roof	0.90	0.362	0.326
Gravel	0.45	0.019	0.009
Grass	0.30	0.495	0.149
Composite C		1.200	0.645

Drainage Area 103 (To Barker St.)

Surface Type	C	A (Ha)	A*C
Asphalt	0.90	0.091	0.08
Grass	0.30	0.065	0.020
Composite C		0.156	0.650

Drainage Area EXT2

Surface Type	C	A (Ha)	A*C
Grass	0.30	0.223	0.067
Composite C		0.223	0.300

Summary

Drainage Area	C	A (Ha)	A*C
101 (To Elm St.)	0.30	0.459	0.138
102 (To Centre St.)	0.65	1.200	0.774
103 (To Barker St.)	0.65	0.156	0.101
EXT2	0.30	0.223	0.067
TOTAL		2.038	0.530



ALLOWABLE RELEASE RATE CALCULATION

IDF set: Picton

Return Period	<i>a</i>	<i>t_c</i>	<i>b</i>	<i>c</i>
2-year	21.2	10	0.0	0.699
5-year	28.2	10	0.0	0.699
10-year	32.8	10	0.0	0.699
25-year	38.5	10	0.0	0.699
50-year	42.8	10	0.0	0.699
100-year	47.0	10	0.0	0.699

Where:
$$I = \frac{a}{(t_c + b)^c}$$

Pre-Development Runoff Volume (ID101)

Return Period	Area (Ha)	Composite C	I (mm/hr)	Q (L/s)
2-year	0.459	0.300	74.18	28.4
5-year	0.459	0.300	98.67	37.7
10-year	0.459	0.300	114.76	43.9
25-year	0.459	0.300	134.71	51.5
50-year	0.459	0.300	149.75	57.3
100-year	0.459	0.300	164.45	62.9

Pre-Development Runoff Volume (ID102)

Return Period	Area (Ha)	Composite C	I (mm/hr)	Q (L/s)
2-year	1.200	0.645	74.18	159.6
5-year	1.200	0.645	98.67	212.3
10-year	1.200	0.645	114.76	114.8
25-year	1.200	0.645	134.71	289.8
50-year	1.200	0.645	149.75	322.2
100-year	1.200	0.645	164.45	353.8

Pre-Development Runoff Volume (ID103)

Return Period	Area (Ha)	Composite C	I (mm/hr)	Q (L/s)
2-year	0.156	0.650	74.18	20.9
5-year	0.156	0.650	98.67	27.8
10-year	0.156	0.650	114.76	14.9
25-year	0.156	0.650	134.71	37.9
50-year	0.156	0.650	149.75	42.2
100-year	0.156	0.650	164.45	46.3



ALLOWABLE RELEASE RATE CALCULATION

Pre-Development Runoff Colume (EXT2)

Return Period	Area (Ha)	Composite C	I (mm/hr)	Q (L/s)
2-year	0.223	0.300	74.18	13.8
5-year	0.223	0.300	98.67	18.3
10-year	0.223	0.300	114.76	21.3
25-year	0.223	0.300	134.71	25.0
50-year	0.223	0.300	149.75	27.8
100-year	0.223	0.300	164.45	30.6

Control Storm 5-year

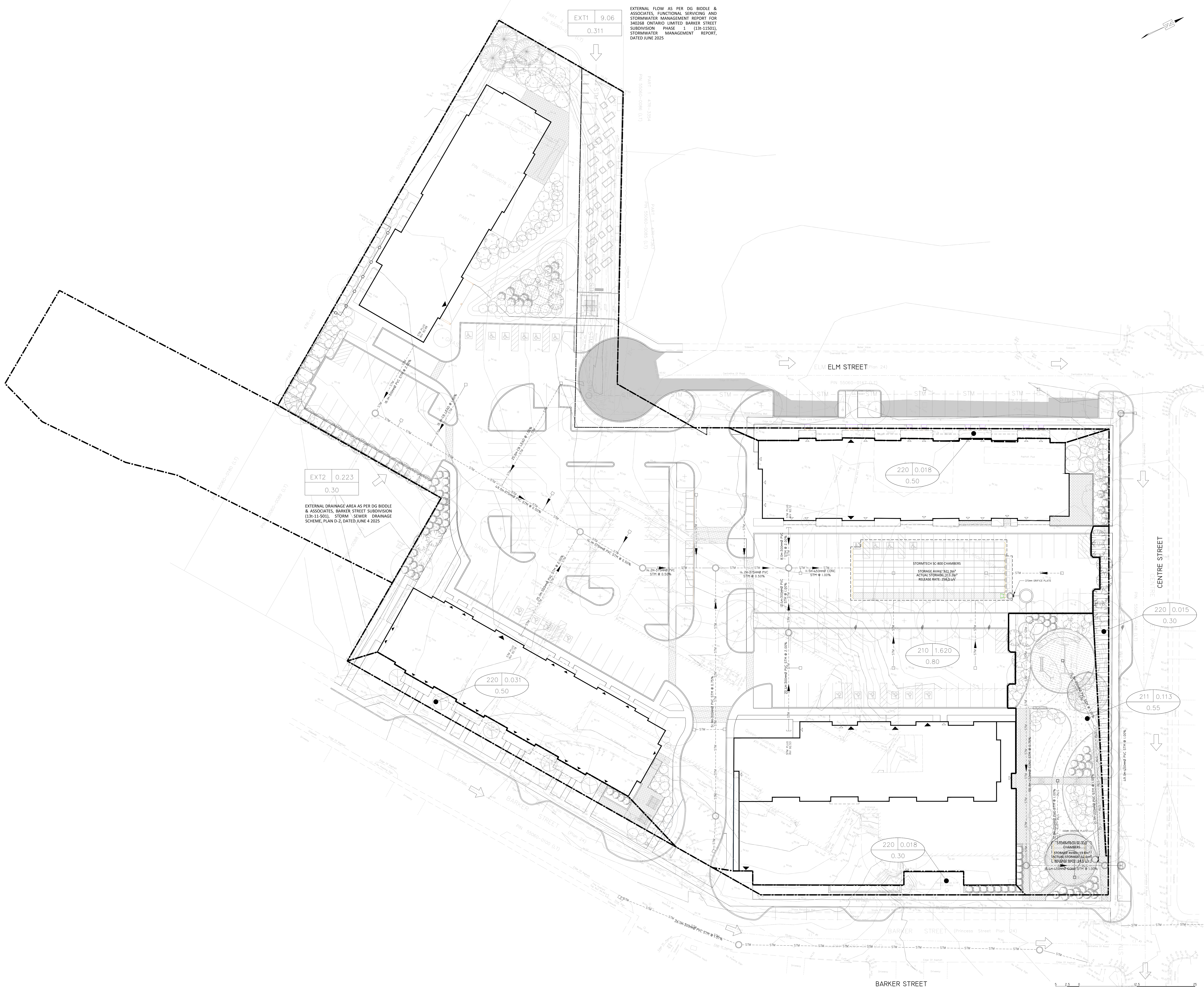
Allowable Release Rate Calculation

Drainage Area	Area (Ha)	Composite C	I (mm/hr)*	Q (L/s)
101	0.459	0.300	98.67	37.7
102	1.200	0.645	98.67	212.3
103	0.156	0.650	98.67	27.8
EXT2	0.223	0.300	98.67	18.3
Total	2.038			296.1

Where: $Q = \frac{CIA}{360}$

¹ Pre-Development and allowable release rate exclude undevelopable area





EXT1	9.06
0.311	

EXT2	0.223
0.30	

EXTERNAL DRAINAGE AREA AS PER DG BIDDLE & ASSOCIATES, BARKER STREET SUBDIVISION (13R-11-501), STORM SEWER DRAINAGE SCHEME, PLAN D-2, DATED JUNE 4, 2025

EXTERNAL FLOW AS PER DG BIDDLE & ASSOCIATES, FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT REPORT FOR 340268 ONTARIO LIMITED BARKER STREET SUBDIVISION PHASE 1 (13R-11501), STORMWATER MANAGEMENT REPORT, DATED JUNE 2025



LOCATION PLAN
N.T.S.

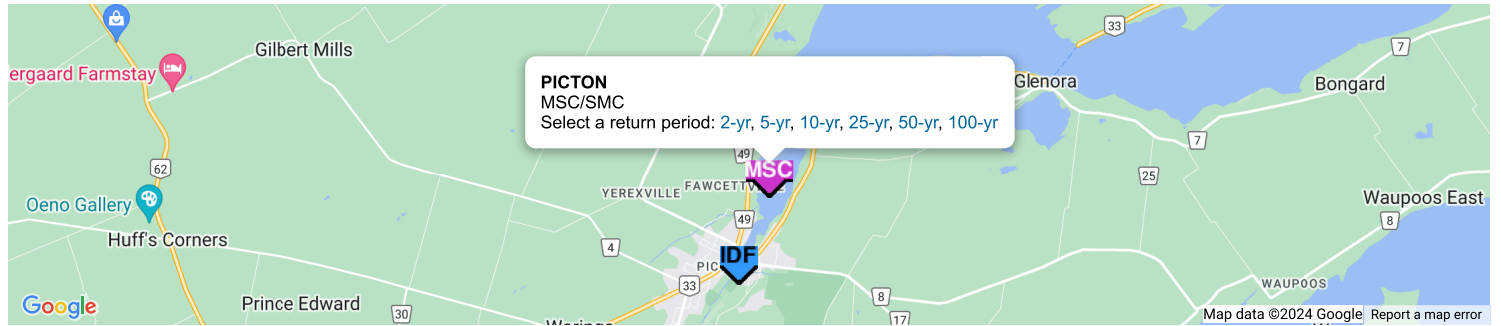
LEGEND

TOWN OF PICTON PRINCE EDWARD COUNTY	
TOWN FILE No.:	COUNTY FILE No.:
SURVEY INFO.	
BENCHMARK	
SITE PLAN INFO.	
HSPH HOLDINGS INC. 51 DAK AVENUE KINGSTON, ON L4C 6H5	
HOMES FIRST QUEEN ELIZABETH RESIDENCES 35 BARKER STREET, PICTON	
POST-DEVELOPMENT DRAINAGE AREA PLAN	
PROJECT No. 24-017	DRAWING 202

Active coordinate

44° 0' 15" N, 77° 8' 15" W (44.004167,-77.137500)

Retrieved: Wed, 20 Mar 2024 15:54:12 GMT



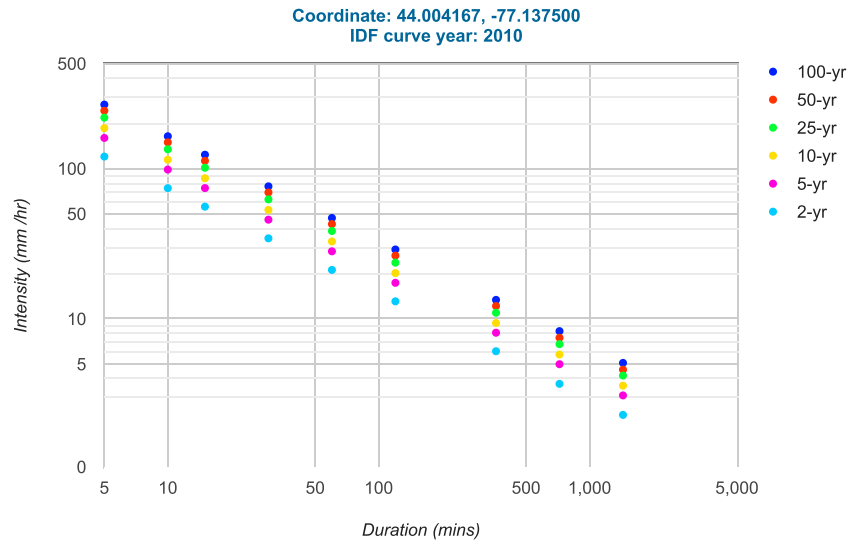
Location summary

These are the locations in the selection.

IDF Curve: 44° 0' 15" N, 77° 8' 15" W (44.004167,-77.137500)

Results

An IDF curve was found.



Coefficient summary

IDF Curve: 44° 0' 15" N, 77° 8' 15" W (44.004167,-77.137500)

Retrieved: Wed, 20 Mar 2024 15:54:12 GMT

Data year: 2010

IDF curve year: 2010

Return period	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
A	21.2	28.2	32.8	38.5	42.8	47.0
B	-0.699	-0.699	-0.699	-0.699	-0.699	-0.699

Statistics

Rainfall intensity (mm hr⁻¹)

Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	120.4	74.2	55.9	34.4	21.2	13.1	6.1	3.7	2.3
5-yr	160.2	98.7	74.3	45.8	28.2	17.4	8.1	5.0	3.1
10-yr	186.3	114.8	86.4	53.2	32.8	20.2	9.4	5.8	3.6
25-yr	218.7	134.7	101.5	62.5	38.5	23.7	11.0	6.8	4.2
50-yr	243.1	149.8	112.8	69.5	42.8	26.4	12.2	7.5	4.6
100-yr	267.0	164.4	123.9	76.3	47.0	29.0	13.4	8.3	5.1

Rainfall depth (mm)

Duration	5-min	10-min	15-min	30-min	1-hr	2-hr	6-hr	12-hr	24-hr
2-yr	10.0	12.4	14.0	17.2	21.2	26.1	36.4	44.8	55.2
5-yr	13.3	16.4	18.6	22.9	28.2	34.7	48.4	59.6	73.4
10-yr	15.5	19.1	21.6	26.6	32.8	40.4	56.2	69.3	85.4
25-yr	18.2	22.5	25.4	31.3	38.5	47.4	66.0	81.3	100.2
50-yr	20.3	25.0	28.2	34.7	42.8	52.7	73.4	90.4	111.4
100-yr	22.2	27.4	31.0	38.1	47.0	57.9	80.6	99.3	122.3

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Coordinate Selection

Current selection:

1

Submit

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Latitude:

44.00390334464

 Longitude:

-77.13789781825

 Return period:

all

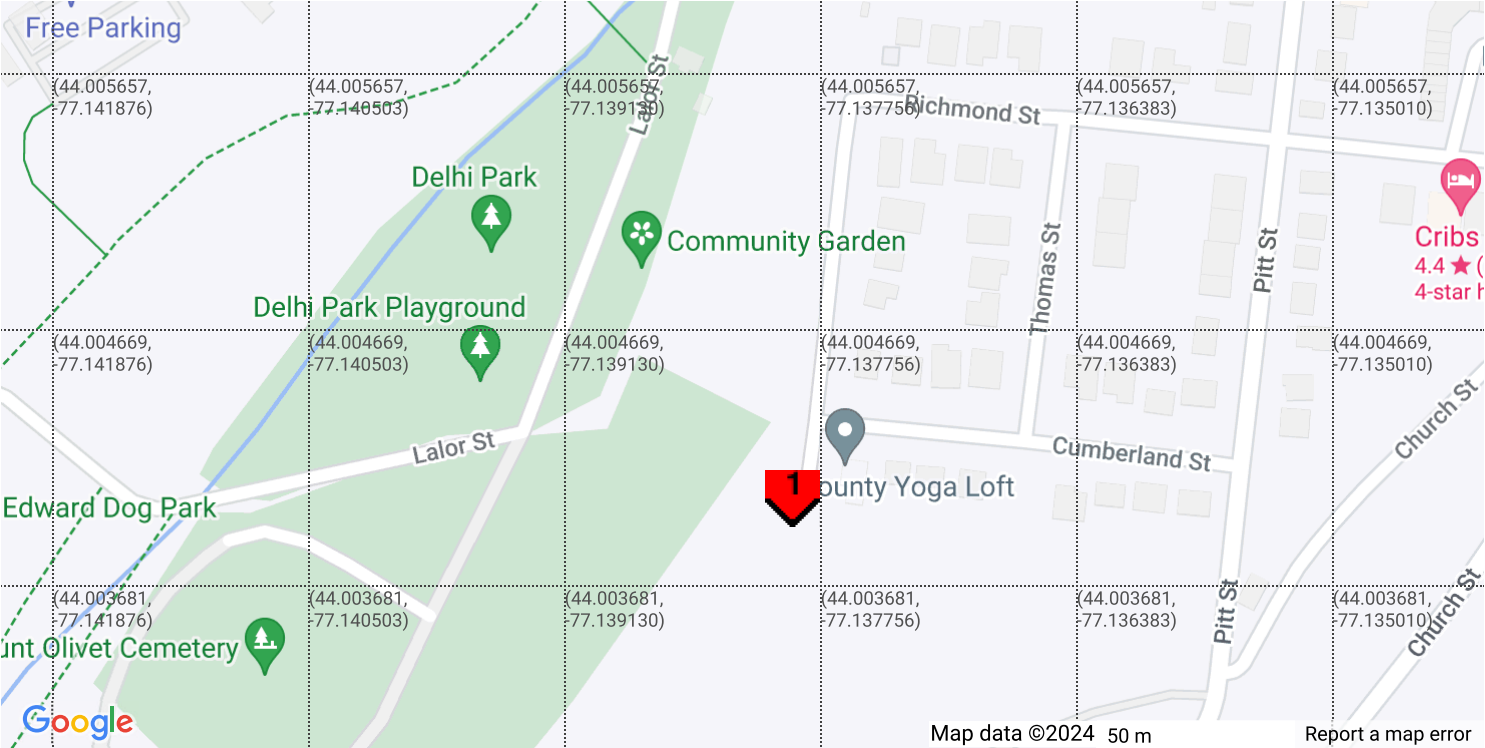
 -yr

IDF curve year:

2010

 (2010 is the reference year for present day IDF curves)

[Hide Options](#)



**POST-DEVELOPMENT
RUNOFF COEFFICIENT**

Drainage Area 210

Surface Type	C	A (Ha)	A*C
Asphalt	0.90	0.814	0.733
Roof	0.90	0.540	0.486
Grass	0.30	0.266	0.080
Composite C		1.620	0.801

Drainage Area 211

Surface Type	C	A (Ha)	A*C
Parkette	0.55	0.113	0.062
Composite C		0.113	0.550

Drainage Area 220

Surface Type	C	A (Ha)	A*C
BLD B to Elm	0.50	0.018	0.009
BLDG A to Barker	0.30	0.018	0.005
BLDG C to Barker	0.50	0.031	0.016
Parkette to Centre	0.30	0.015	0.005
Composite C		0.082	0.420

Drainage Area EXT2

Surface Type	C	A (Ha)	A*C
Grass	0.30	0.223	0.067
Composite C		0.223	0.300

Summary

Drainage Area	C	A (Ha)	A*C
210	0.801	1.620	1.298
211	0.550	0.113	0.062
220	0.420	0.082	0.034
EXT2	0.300	0.223	0.067
TOTAL		2.038	0.717



**STORMWATER MANAGEMENT
QUANTITY CONTROL SUMMARY**

2-year Summary Matrix

Drainage Area	EXT2	210	211	220	Total
Bldg ID					
C₂	0.300	0.801	0.550	0.420	-
A (Ha)	0.223	1.62	0.11	0.082	2.04
Q_{Release} (L/s)	13.8	80.9	4.8	7.1	92.8
Storage (m³)	0.0	120.4	4.8	0.0	125.2
Vol. Avail. (m³)	-	321.1	13.8	-	334.9
Orifice	Uncontrolled	370	100	Uncontrolled	-
Q_{Orifice} (L/s)	-	80.9	4.8	-	-
Unctrl'd Q	13.8	-	-	7.1	-
Orifice type	-	PLATE	PLATE	-	-

5-year Summary Matrix

Drainage Area	EXT2	210	211	220	Total
Bldg ID					
C₅	0.300	0.801	0.550	0.420	-
A (Ha)	0.223	1.62	0.11	0.082	2.04
Q_{Release} (L/s)	18.4	116.3	6.8	9.4	132.5
Storage (m³)	0.0	154.9	6.1	0.0	161.1
Vol. Avail. (m³)	-	321.1	13.8	-	334.9
Orifice	Uncontrolled	370	100	Uncontrolled	-
Q_{Orifice} (L/s)	-	116.3	6.8	-	-
Unctrl'd Q	18.4	-	-	9.4	-
Orifice type	-	PLATE	PLATE	-	-

10-Year Summary Matrix

Drainage Area	EXT2	210	211	220	Total
Bldg ID					
C₁₀	0.300	0.801	0.550	0.42	-
A (Ha)	0.223	1.62	0.11	0.082	2.04
Q_{Release} (L/s)	21.3	143.1	8.4	11.0	162.5
Storage (m³)	0.0	175.5	6.9	0.0	175.5
Vol. Avail. (m³)	-	321.1	13.8	-	321.1
Orifice	Uncontrolled	370	100	Uncontrolled	-
Q_{Orifice} (L/s)	-	143.1	8.4	-	-
Unctrl'd Q	21.3	-	-	11.0	-
Orifice type	-	PLATE	PLATE	-	-



**STORMWATER MANAGEMENT
QUANTITY CONTROL SUMMARY**

25-Year Summary Matrix

Drainage Area	EXT2	210	211	220	Total
Bldg ID					
C₂₅	0.330	0.882	0.605	0.46	-
A (Ha)	0.223	1.62	0.11	0.082	2.04
Q_{Release} (L/s)	27.6	183.2	10.3	14.2	207.7
Storage (m³)	0.0	227.5	9.2	0.0	227.5
Vol. Avail. (m³)	-	321.1	13.8	-	321.1
Orifice	Uncontrolled	370	100	Uncontrolled	-
Q_{Orifice} (L/s)	-	183.2	10.3	-	-
Unctrl'd Q	27.6	-	-	14.2	-
Orifice type	-	PLATE	PLATE	-	-

50-Year Summary

Drainage Area	EXT2	210	211	220	Total
Bldg ID					
C₅₀	0.360	0.962	0.660	0.503	-
A (Ha)	0.223	1.62	0.11	0.082	2.04
Q_{Release} (L/s)	33.4	222.0	12.6	17.2	251.7
Storage (m³)	0.0	276.1	11.1	0.0	276.1
Vol. Avail. (m³)	-	321.1	13.8	-	321.1
Orifice	Uncontrolled	370	100	Uncontrolled	-
Q_{Orifice} (L/s)	-	222.0	12.6	-	-
Unctrl'd Q	33.4	-	-	17.2	-
Orifice type	-	PLATE	PLATE	-	-

100-Year Summary

Drainage Area	EXT2	210	211	220	Total
Bldg ID					
C₁₀₀	0.375	1.002	0.688	0.524	-
A (Ha)	0.223	1.62	0.11	0.082	2.04
Q_{Release} (L/s)	38.2	258.3	14.5	19.7	292.4
Storage (m³)	0.0	313.2	12.6	0.0	325.8
Vol. Avail. (m³)	-	321.1	13.8	-	334.9
Orifice	Uncontrolled	370	100	Uncontrolled	-
Q_{Orifice} (L/s)	-	258.3	14.5	-	-
Unctrl'd Q	38.2	-	-	19.7	-
Orifice type	-	PLATE	PLATE	-	-



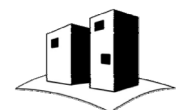
**MODIFIED RATIONAL METHOD
STORAGE CALCULATIONS**

Drainage Area 210	
Area (Ha)	1.62
C ₂	0.80
AC	1.30
T _c (min)	10.0
T incr. (min)	5
Q ₁ (l/s)	80.9
Req. vol. (m ³)	120.4

Picton	2-year
a=	21.2
b=	0
c=	0.699

Notes:

Required Storage Summary						
Total Vol.						
T (min)	I (mm/hr)	Q (l/s)	(m³)	Ext. Vol. (m³)	Rel. Vol. (m³)	Storage (m³)
10	74.2	267.7	160.6	8.3	48.5	120.4
15	55.9	201.7	181.5	8.3	72.8	117.0
20	45.7	164.9	197.9	8.3	97.0	109.1
25	39.1	141.1	211.7	8.3	121.3	98.6
30	34.4	124.2	223.6	8.3	145.6	86.3
35	30.9	111.5	234.2	8.3	169.8	72.7
40	28.1	101.6	243.8	8.3	194.1	58.0
45	25.9	93.6	252.6	8.3	218.3	42.6
50	24.1	86.9	260.8	8.3	242.6	26.4
55	22.5	81.3	268.4	8.3	266.9	9.8
60	21.2	76.5	275.5	8.3	291.1	-
65	20.0	72.4	282.2	8.3	315.4	-
70	19.0	68.7	288.6	8.3	339.6	-
75	18.1	65.5	294.6	8.3	363.9	-
80	17.3	62.6	300.4	8.3	388.2	-
85	16.6	60.0	305.9	8.3	412.4	-
90	16.0	57.6	311.2	8.3	436.7	-
95	15.4	55.5	316.3	8.3	460.9	-
100	14.8	53.5	321.3	8.3	485.2	-
105	14.3	51.7	326.0	8.3	509.5	-
110	13.9	50.1	330.6	8.3	533.7	-
115	13.5	48.6	335.1	8.3	558.0	-
120	13.1	47.1	339.4	8.3	582.2	-
125	12.7	45.8	343.6	8.3	606.5	-
130	12.3	44.6	347.7	8.3	630.8	-
135	12.0	43.4	351.6	8.3	655.0	-
140	11.7	42.3	355.5	8.3	679.3	-
145	11.4	41.3	359.3	8.3	703.5	-
150	11.2	40.3	363.0	8.3	727.8	-
155	10.9	39.4	366.6	8.3	752.1	-
160	10.7	38.6	370.1	8.3	776.3	-



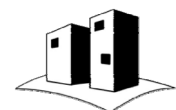
**MODIFIED RATIONAL METHOD
STORAGE CALCULATIONS**

Drainage Area 210	
Area (Ha)	1.62
C ₅	0.80
AC	1.30
T _c (min)	10.0
T incr. (min)	5
Q ₁ (l/s)	116.3
Req. vol. (m ³)	154.9

Picton	5-year
a=	28.2
b=	0
c=	0.699

Notes:

Required Storage Summary						
Total Vol.						
T (min)	I (mm/hr)	Q (l/s)	(m³)	Ext. Vol. (m³)	Rel. Vol. (m³)	Storage (m³)
10	98.7	356.1	213.7	11.0	69.8	154.9
15	74.3	268.3	241.4	11.0	104.6	147.8
20	60.8	219.4	263.3	11.0	139.5	134.8
25	52.0	187.7	281.6	11.0	174.4	118.2
30	45.8	165.2	297.4	11.0	209.3	99.2
35	41.1	148.4	311.6	11.0	244.1	78.4
40	37.4	135.1	324.3	11.0	279.0	56.3
45	34.5	124.5	336.0	11.0	313.9	33.2
50	32.0	115.6	346.9	11.0	348.8	9.1
55	30.0	108.2	357.0	11.0	383.6	-
60	28.2	101.8	366.4	11.0	418.5	-
65	26.7	96.3	375.4	11.0	453.4	-
70	25.3	91.4	383.8	11.0	488.3	-
75	24.1	87.1	391.9	11.0	523.1	-
80	23.1	83.2	399.6	11.0	558.0	-
85	22.1	79.8	406.9	11.0	592.9	-
90	21.2	76.7	414.0	11.0	627.8	-
95	20.5	73.8	420.8	11.0	662.6	-
100	19.7	71.2	427.3	11.0	697.5	-
105	19.1	68.8	433.7	11.0	732.4	-
110	18.5	66.6	439.8	11.0	767.3	-
115	17.9	64.6	445.7	11.0	802.1	-
120	17.4	62.7	451.5	11.0	837.0	-
125	16.9	60.9	457.0	11.0	871.9	-
130	16.4	59.3	462.5	11.0	906.8	-
135	16.0	57.7	467.7	11.0	941.6	-
140	15.6	56.3	472.9	11.0	976.5	-
145	15.2	54.9	477.9	11.0	1011.4	-
150	14.9	53.6	482.8	11.0	1046.3	-
155	14.5	52.4	487.6	11.0	1081.1	-
160	14.2	51.3	492.3	11.0	1116.0	-



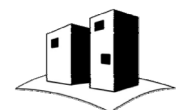
**MODIFIED RATIONAL METHOD
STORAGE CALCULATIONS**

Drainage Area 210	
Area (Ha)	1.62
C ₁₀	0.80
AC	1.30
T _c (min)	10.0
T incr. (min)	5
Q ₁ (l/s)	143.1
Req. vol. (m ³)	175.5

Picton	10-year
a=	32.8
b=	0
c=	0.699

Notes:

Required Storage Summary						
Total Vol.						
T (min)	I (mm/hr)	Q (l/s)	(m³)	Ext. Vol. (m³)	Rel. Vol. (m³)	Storage (m³)
10	114.8	414.2	248.5	12.8	85.9	175.5
15	86.4	312.0	280.8	12.8	128.8	164.8
20	70.7	255.2	306.2	12.8	171.8	147.2
25	60.5	218.3	327.5	12.8	214.7	125.6
30	53.2	192.2	346.0	12.8	257.7	101.1
35	47.8	172.6	362.4	12.8	300.6	74.6
40	43.5	157.2	377.2	12.8	343.5	46.5
45	40.1	144.8	390.9	12.8	386.5	17.2
50	37.3	134.5	403.5	12.8	429.4	-
55	34.9	125.8	415.2	12.8	472.4	-
60	32.8	118.4	426.2	12.8	515.3	-
65	31.0	112.0	436.6	12.8	558.3	-
70	29.4	106.3	446.5	12.8	601.2	-
75	28.1	101.3	455.8	12.8	644.1	-
80	26.8	96.8	464.8	12.8	687.1	-
85	25.7	92.8	473.3	12.8	730.0	-
90	24.7	89.2	481.5	12.8	773.0	-
95	23.8	85.9	489.4	12.8	815.9	-
100	23.0	82.8	497.1	12.8	858.9	-
105	22.2	80.1	504.4	12.8	901.8	-
110	21.5	77.5	511.5	12.8	944.7	-
115	20.8	75.1	518.4	12.8	987.7	-
120	20.2	72.9	525.1	12.8	1030.6	-
125	19.6	70.9	531.6	12.8	1073.6	-
130	19.1	69.0	537.9	12.8	1116.5	-
135	18.6	67.2	544.0	12.8	1159.5	-
140	18.1	65.5	550.0	12.8	1202.4	-
145	17.7	63.9	555.9	12.8	1245.3	-
150	17.3	62.4	561.6	12.8	1288.3	-
155	16.9	61.0	567.1	12.8	1331.2	-
160	16.5	59.6	572.6	12.8	1374.2	-



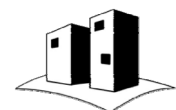
**MODIFIED RATIONAL METHOD
STORAGE CALCULATIONS**

Drainage Area 210	
Area (Ha)	1.62
C ₂₅	0.88
AC	1.43
T _c (min)	10.0
T incr. (min)	5
Q ₁ (l/s)	183.2
Req. vol. (m ³)	227.5

Picton	25-year
a=	38.5
b=	0
c=	0.699

Notes:

Required Storage Summary						
Total Vol.						
T (min)	I (mm/hr)	Q (l/s)	(m³)	Ext. Vol. (m³)	Rel. Vol. (m³)	Storage (m³)
10	134.7	534.9	320.9	16.5	109.9	227.5
15	101.5	402.9	362.6	16.5	164.9	214.2
20	83.0	329.5	395.4	16.5	219.9	192.0
25	71.0	281.9	422.8	16.5	274.8	164.5
30	62.5	248.2	446.7	16.5	329.8	133.4
35	56.1	222.8	467.9	16.5	384.8	99.7
40	51.1	203.0	487.1	16.5	439.7	63.9
45	47.1	186.9	504.7	16.5	494.7	26.5
50	43.7	173.6	520.9	16.5	549.6	-
55	40.9	162.5	536.1	16.5	604.6	-
60	38.5	152.9	550.3	16.5	659.6	-
65	36.4	144.5	563.7	16.5	714.5	-
70	34.6	137.2	576.4	16.5	769.5	-
75	32.9	130.8	588.5	16.5	824.5	-
80	31.5	125.0	600.1	16.5	879.4	-
85	30.2	119.8	611.1	16.5	934.4	-
90	29.0	115.1	621.7	16.5	989.4	-
95	27.9	110.9	631.9	16.5	1044.3	-
100	26.9	107.0	641.8	16.5	1099.3	-
105	26.0	103.4	651.3	16.5	1154.3	-
110	25.2	100.1	660.5	16.5	1209.2	-
115	24.4	97.0	669.4	16.5	1264.2	-
120	23.7	94.2	678.0	16.5	1319.2	-
125	23.0	91.5	686.4	16.5	1374.1	-
130	22.4	89.0	694.5	16.5	1429.1	-
135	21.8	86.7	702.5	16.5	1484.1	-
140	21.3	84.5	710.2	16.5	1539.0	-
145	20.8	82.5	717.7	16.5	1594.0	-
150	20.3	80.6	725.1	16.5	1648.9	-
155	19.8	78.7	732.3	16.5	1703.9	-
160	19.4	77.0	739.3	16.5	1758.9	-



**MODIFIED RATIONAL METHOD
STORAGE CALCULATIONS**

Drainage Area 210	
Area (Ha)	1.62
C ₅₀	0.96
AC	1.56
T _c (min)	10.0
T incr. (min)	5
Q ₁ (l/s)	222.0
Req. vol. (m ³)	276.1

Picton	50-year
a=	42.8
b=	0
c=	0.699

Notes:

Required Storage Summary

Total Vol.						
T (min)	I (mm/hr)	Q (l/s)	(m³)	Ext. Vol. (m³)	Rel. Vol. (m³)	Storage (m³)
10	149.8	648.6	389.2	20.1	133.2	276.1
15	112.8	488.6	439.7	20.1	199.8	260.0
20	92.2	399.6	479.5	20.1	266.3	233.2
25	78.9	341.9	512.8	20.1	332.9	199.9
30	69.5	301.0	541.7	20.1	399.5	162.3
35	62.4	270.2	567.4	20.1	466.1	121.4
40	56.8	246.1	590.7	20.1	532.7	78.1
45	52.3	226.7	612.0	20.1	599.3	32.8
50	48.6	210.6	631.8	20.1	665.9	-
55	45.5	197.0	650.1	20.1	732.4	-
60	42.8	185.4	667.4	20.1	799.0	-
65	40.5	175.3	683.7	20.1	865.6	-
70	38.4	166.4	699.1	20.1	932.2	-
75	36.6	158.6	713.8	20.1	998.8	-
80	35.0	151.6	727.8	20.1	1065.4	-
85	33.6	145.3	741.2	20.1	1132.0	-
90	32.2	139.6	754.0	20.1	1198.5	-
95	31.0	134.5	766.4	20.1	1265.1	-
100	29.9	129.7	778.3	20.1	1331.7	-
105	28.9	125.4	789.8	20.1	1398.3	-
110	28.0	121.4	801.0	20.1	1464.9	-
115	27.2	117.6	811.8	20.1	1531.5	-
120	26.4	114.2	822.2	20.1	1598.1	-
125	25.6	111.0	832.4	20.1	1664.6	-
130	24.9	108.0	842.3	20.1	1731.2	-
135	24.3	105.2	851.9	20.1	1797.8	-
140	23.7	102.5	861.3	20.1	1864.4	-
145	23.1	100.0	870.4	20.1	1931.0	-
150	22.6	97.7	879.3	20.1	1997.6	-
155	22.0	95.5	888.1	20.1	2064.2	-
160	21.6	93.4	896.6	20.1	2130.7	-



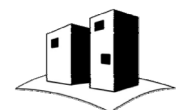
**MODIFIED RATIONAL METHOD
STORAGE CALCULATIONS**

Drainage Area 210	
Area (Ha)	1.62
C ₁₀₀	1.00
AC	1.62
T _c (min)	10.0
T incr. (min)	5
Q ₁ (l/s)	258.3
Req. vol. (m ³)	313.2

Picton	100-year
a=	47
b=	0
c=	0.699

Notes:

Required Storage Summary						
Total Vol.						
T (min)	I (mm/hr)	Q (l/s)	(m³)	Ext. Vol. (m³)	Rel. Vol. (m³)	Storage (m³)
10	164.4	742.0	445.2	22.9	155.0	313.2
15	123.9	558.9	503.0	22.9	232.4	293.5
20	101.3	457.1	548.5	22.9	309.9	261.5
25	86.7	391.0	586.6	22.9	387.4	222.1
30	76.3	344.3	619.7	22.9	464.9	177.7
35	68.5	309.1	649.1	22.9	542.4	129.7
40	62.4	281.5	675.7	22.9	619.8	78.8
45	57.5	259.3	700.1	22.9	697.3	25.7
50	53.4	240.9	722.7	22.9	774.8	-
55	49.9	225.4	743.7	22.9	852.3	-
60	47.0	212.1	763.4	22.9	929.8	-
65	44.4	200.5	782.0	22.9	1007.2	-
70	42.2	190.4	799.7	22.9	1084.7	-
75	40.2	181.4	816.5	22.9	1162.2	-
80	38.4	173.4	832.5	22.9	1239.7	-
85	36.8	166.2	847.8	22.9	1317.2	-
90	35.4	159.7	862.5	22.9	1394.6	-
95	34.1	153.8	876.7	22.9	1472.1	-
100	32.9	148.4	890.3	22.9	1549.6	-
105	31.8	143.4	903.5	22.9	1627.1	-
110	30.8	138.8	916.2	22.9	1704.5	-
115	29.8	134.6	928.6	22.9	1782.0	-
120	29.0	130.6	940.5	22.9	1859.5	-
125	28.1	127.0	952.2	22.9	1937.0	-
130	27.4	123.5	963.5	22.9	2014.5	-
135	26.7	120.3	974.5	22.9	2091.9	-
140	26.0	117.3	985.2	22.9	2169.4	-
145	25.4	114.4	995.7	22.9	2246.9	-
150	24.8	111.8	1005.9	22.9	2324.4	-
155	24.2	109.2	1015.9	22.9	2401.9	-
160	23.7	106.8	1025.6	22.9	2479.3	-



**MODIFIED RATIONAL METHOD
STORAGE CALCULATIONS**

Drainage Area 211	
Area (Ha)	0.11
C ₂	0.55
AC	0.06
T _c (min)	10.0
T incr. (min)	5
Q ₁ (l/s)	4.8
Req. vol. (m ³)	4.8

Picton	2-year
a=	21.2
b=	0
c=	0.699

Notes:

Required Storage Summary						
Total Vol.						
T (min)	I (mm/hr)	Q (l/s)	(m³)	Ext. Vol.	Rel. Vol. (m³)	Storage (m³)
10	74.2	12.8	7.7	0.0	2.9	4.8
15	55.9	9.7	8.7	0.0	4.3	4.3
20	45.7	7.9	9.5	0.0	5.8	3.7
25	39.1	6.8	10.1	0.0	7.2	2.9
30	34.4	5.9	10.7	0.0	8.7	2.0
35	30.9	5.3	11.2	0.0	10.1	1.1
40	28.1	4.9	11.7	0.0	11.6	0.1
45	25.9	4.5	12.1	0.0	13.0	-
50	24.1	4.2	12.5	0.0	14.5	-
55	22.5	3.9	12.8	0.0	15.9	-
60	21.2	3.7	13.2	0.0	17.4	-
65	20.0	3.5	13.5	0.0	18.8	-
70	19.0	3.3	13.8	0.0	20.3	-
75	18.1	3.1	14.1	0.0	21.7	-
80	17.3	3.0	14.4	0.0	23.2	-
85	16.6	2.9	14.6	0.0	24.6	-
90	16.0	2.8	14.9	0.0	26.0	-
95	15.4	2.7	15.1	0.0	27.5	-
100	14.8	2.6	15.4	0.0	28.9	-
105	14.3	2.5	15.6	0.0	30.4	-
110	13.9	2.4	15.8	0.0	31.8	-
115	13.5	2.3	16.0	0.0	33.3	-
120	13.1	2.3	16.2	0.0	34.7	-
125	12.7	2.2	16.4	0.0	36.2	-
130	12.3	2.1	16.6	0.0	37.6	-
135	12.0	2.1	16.8	0.0	39.1	-
140	11.7	2.0	17.0	0.0	40.5	-
145	11.4	2.0	17.2	0.0	42.0	-
150	11.2	1.9	17.4	0.0	43.4	-
155	10.9	1.9	17.5	0.0	44.9	-
160	10.7	1.8	17.7	0.0	46.3	-



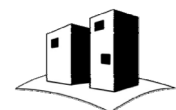
**MODIFIED RATIONAL METHOD
STORAGE CALCULATIONS**

Drainage Area 211	
Area (Ha)	0.11
C ₅	0.55
AC	0.06
T _c (min)	10.0
T incr. (min)	5
Q ₁ (l/s)	6.8
Req. vol. (m ³)	6.1

Picton	5-year
a=	28.2
b=	0
c=	0.699

Notes:

Required Storage Summary						
Total Vol.						
T (min)	I (mm/hr)	Q (l/s)	(m³)	Ext. Vol.	Rel. Vol. (m³)	Storage (m³)
10	98.7	17.0	10.2	0.0	4.1	6.1
15	74.3	12.8	11.6	0.0	6.1	5.4
20	60.8	10.5	12.6	0.0	8.2	4.4
25	52.0	9.0	13.5	0.0	10.2	3.2
30	45.8	7.9	14.2	0.0	12.3	2.0
35	41.1	7.1	14.9	0.0	14.3	0.6
40	37.4	6.5	15.5	0.0	16.4	-
45	34.5	6.0	16.1	0.0	18.4	-
50	32.0	5.5	16.6	0.0	20.5	-
55	30.0	5.2	17.1	0.0	22.5	-
60	28.2	4.9	17.5	0.0	24.6	-
65	26.7	4.6	18.0	0.0	26.6	-
70	25.3	4.4	18.4	0.0	28.6	-
75	24.1	4.2	18.8	0.0	30.7	-
80	23.1	4.0	19.1	0.0	32.7	-
85	22.1	3.8	19.5	0.0	34.8	-
90	21.2	3.7	19.8	0.0	36.8	-
95	20.5	3.5	20.1	0.0	38.9	-
100	19.7	3.4	20.5	0.0	40.9	-
105	19.1	3.3	20.8	0.0	43.0	-
110	18.5	3.2	21.1	0.0	45.0	-
115	17.9	3.1	21.3	0.0	47.1	-
120	17.4	3.0	21.6	0.0	49.1	-
125	16.9	2.9	21.9	0.0	51.2	-
130	16.4	2.8	22.1	0.0	53.2	-
135	16.0	2.8	22.4	0.0	55.2	-
140	15.6	2.7	22.6	0.0	57.3	-
145	15.2	2.6	22.9	0.0	59.3	-
150	14.9	2.6	23.1	0.0	61.4	-
155	14.5	2.5	23.3	0.0	63.4	-
160	14.2	2.5	23.6	0.0	65.5	-



**MODIFIED RATIONAL METHOD
STORAGE CALCULATIONS**

Drainage Area 211	
Area (Ha)	0.11
C ₁₀	0.55
AC	0.06
T _c (min)	10.0
T incr. (min)	5
Q ₁ (l/s)	8.4
Req. vol. (m ³)	6.9

Picton	10-year
a=	32.8
b=	0
c=	0.699

Notes:

Required Storage Summary						
Total Vol.						
T (min)	I (mm/hr)	Q (l/s)	(m³)	Ext. Vol.	Rel. Vol. (m³)	Storage (m³)
10	114.8	19.8	11.9	0.0	5.0	6.9
15	86.4	14.9	13.4	0.0	7.5	5.9
20	70.7	12.2	14.7	0.0	10.0	4.6
25	60.5	10.5	15.7	0.0	12.5	3.1
30	53.2	9.2	16.6	0.0	15.0	1.5
35	47.8	8.3	17.3	0.0	17.5	-
40	43.5	7.5	18.1	0.0	20.0	-
45	40.1	6.9	18.7	0.0	22.6	-
50	37.3	6.4	19.3	0.0	25.1	-
55	34.9	6.0	19.9	0.0	27.6	-
60	32.8	5.7	20.4	0.0	30.1	-
65	31.0	5.4	20.9	0.0	32.6	-
70	29.4	5.1	21.4	0.0	35.1	-
75	28.1	4.8	21.8	0.0	37.6	-
80	26.8	4.6	22.2	0.0	40.1	-
85	25.7	4.4	22.7	0.0	42.6	-
90	24.7	4.3	23.0	0.0	45.1	-
95	23.8	4.1	23.4	0.0	47.6	-
100	23.0	4.0	23.8	0.0	50.1	-
105	22.2	3.8	24.1	0.0	52.6	-
110	21.5	3.7	24.5	0.0	55.1	-
115	20.8	3.6	24.8	0.0	57.6	-
120	20.2	3.5	25.1	0.0	60.1	-
125	19.6	3.4	25.4	0.0	62.7	-
130	19.1	3.3	25.7	0.0	65.2	-
135	18.6	3.2	26.0	0.0	67.7	-
140	18.1	3.1	26.3	0.0	70.2	-
145	17.7	3.1	26.6	0.0	72.7	-
150	17.3	3.0	26.9	0.0	75.2	-
155	16.9	2.9	27.1	0.0	77.7	-
160	16.5	2.9	27.4	0.0	80.2	-



**MODIFIED RATIONAL METHOD
STORAGE CALCULATIONS**

Drainage Area 211	
Area (Ha)	0.11
C ₂₅	0.61
AC	0.07
T _c (min)	10.0
T incr. (min)	5
Q ₁ (l/s)	10.3
Req. vol. (m ³)	9.2

Picton	25-year
a=	38.5
b=	0
c=	0.699

Notes:

Required Storage Summary

Total Vol.						
T (min)	I (mm/hr)	Q (l/s)	(m³)	Ext. Vol.	Rel. Vol. (m³)	Storage (m³)
10	134.7	25.6	15.4	0.0	6.2	9.2
15	101.5	19.3	17.4	0.0	9.3	8.0
20	83.0	15.8	18.9	0.0	12.4	6.5
25	71.0	13.5	20.2	0.0	15.5	4.7
30	62.5	11.9	21.4	0.0	18.6	2.8
35	56.1	10.7	22.4	0.0	21.7	0.7
40	51.1	9.7	23.3	0.0	24.8	-
45	47.1	8.9	24.2	0.0	27.9	-
50	43.7	8.3	24.9	0.0	31.0	-
55	40.9	7.8	25.7	0.0	34.1	-
60	38.5	7.3	26.3	0.0	37.2	-
65	36.4	6.9	27.0	0.0	40.3	-
70	34.6	6.6	27.6	0.0	43.4	-
75	32.9	6.3	28.2	0.0	46.5	-
80	31.5	6.0	28.7	0.0	49.7	-
85	30.2	5.7	29.3	0.0	52.8	-
90	29.0	5.5	29.8	0.0	55.9	-
95	27.9	5.3	30.2	0.0	59.0	-
100	26.9	5.1	30.7	0.0	62.1	-
105	26.0	4.9	31.2	0.0	65.2	-
110	25.2	4.8	31.6	0.0	68.3	-
115	24.4	4.6	32.0	0.0	71.4	-
120	23.7	4.5	32.5	0.0	74.5	-
125	23.0	4.4	32.9	0.0	77.6	-
130	22.4	4.3	33.2	0.0	80.7	-
135	21.8	4.2	33.6	0.0	83.8	-
140	21.3	4.0	34.0	0.0	86.9	-
145	20.8	3.9	34.4	0.0	90.0	-
150	20.3	3.9	34.7	0.0	93.1	-
155	19.8	3.8	35.1	0.0	96.2	-
160	19.4	3.7	35.4	0.0	99.3	-



**MODIFIED RATIONAL METHOD
STORAGE CALCULATIONS**

Drainage Area 211	
Area (Ha)	0.11
C ₅₀	0.66
AC	0.07
T _c (min)	10.0
T incr. (min)	5
Q ₁ (l/s)	12.6
Req. vol. (m ³)	11.1

Picton	50-year
a=	42.8
b=	0
c=	0.699

Notes:

Required Storage Summary						
Total Vol.						
T (min)	I (mm/hr)	Q (l/s)	(m³)	Ext. Vol.	Rel. Vol. (m³)	Storage (m³)
10	149.8	31.0	18.6	0.0	7.5	11.1
15	112.8	23.4	21.0	0.0	11.3	9.7
20	92.2	19.1	23.0	0.0	15.1	7.9
25	78.9	16.4	24.5	0.0	18.9	5.7
30	69.5	14.4	25.9	0.0	22.6	3.3
35	62.4	12.9	27.2	0.0	26.4	0.8
40	56.8	11.8	28.3	0.0	30.2	-
45	52.3	10.9	29.3	0.0	34.0	-
50	48.6	10.1	30.2	0.0	37.7	-
55	45.5	9.4	31.1	0.0	41.5	-
60	42.8	8.9	31.9	0.0	45.3	-
65	40.5	8.4	32.7	0.0	49.0	-
70	38.4	8.0	33.5	0.0	52.8	-
75	36.6	7.6	34.2	0.0	56.6	-
80	35.0	7.3	34.8	0.0	60.4	-
85	33.6	7.0	35.5	0.0	64.1	-
90	32.2	6.7	36.1	0.0	67.9	-
95	31.0	6.4	36.7	0.0	71.7	-
100	29.9	6.2	37.3	0.0	75.5	-
105	28.9	6.0	37.8	0.0	79.2	-
110	28.0	5.8	38.3	0.0	83.0	-
115	27.2	5.6	38.9	0.0	86.8	-
120	26.4	5.5	39.4	0.0	90.6	-
125	25.6	5.3	39.8	0.0	94.3	-
130	24.9	5.2	40.3	0.0	98.1	-
135	24.3	5.0	40.8	0.0	101.9	-
140	23.7	4.9	41.2	0.0	105.6	-
145	23.1	4.8	41.7	0.0	109.4	-
150	22.6	4.7	42.1	0.0	113.2	-
155	22.0	4.6	42.5	0.0	117.0	-
160	21.6	4.5	42.9	0.0	120.7	-



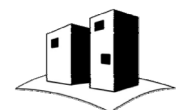
**MODIFIED RATIONAL METHOD
STORAGE CALCULATIONS**

Drainage Area 211	
Area (Ha)	0.11
C ₁₀₀	0.69
AC	0.08
T _c (min)	10.0
T incr. (min)	5
Q ₁ (l/s)	14.5
Req. vol. (m ³)	12.6

Picton	100-year
a=	47
b=	0
c=	0.699

Notes:

Required Storage Summary						
Total Vol.						
T (min)	I (mm/hr)	Q (l/s)	(m³)	Ext. Vol.	Rel. Vol. (m³)	Storage (m³)
10	164.4	35.5	21.3	0.0	8.7	12.6
15	123.9	26.8	24.1	0.0	13.0	11.1
20	101.3	21.9	26.3	0.0	17.4	8.9
25	86.7	18.7	28.1	0.0	21.7	6.4
30	76.3	16.5	29.7	0.0	26.0	3.6
35	68.5	14.8	31.1	0.0	30.4	0.7
40	62.4	13.5	32.3	0.0	34.7	-
45	57.5	12.4	33.5	0.0	39.1	-
50	53.4	11.5	34.6	0.0	43.4	-
55	49.9	10.8	35.6	0.0	47.7	-
60	47.0	10.2	36.5	0.0	52.1	-
65	44.4	9.6	37.4	0.0	56.4	-
70	42.2	9.1	38.3	0.0	60.8	-
75	40.2	8.7	39.1	0.0	65.1	-
80	38.4	8.3	39.8	0.0	69.5	-
85	36.8	8.0	40.6	0.0	73.8	-
90	35.4	7.6	41.3	0.0	78.1	-
95	34.1	7.4	42.0	0.0	82.5	-
100	32.9	7.1	42.6	0.0	86.8	-
105	31.8	6.9	43.2	0.0	91.2	-
110	30.8	6.6	43.9	0.0	95.5	-
115	29.8	6.4	44.4	0.0	99.8	-
120	29.0	6.3	45.0	0.0	104.2	-
125	28.1	6.1	45.6	0.0	108.5	-
130	27.4	5.9	46.1	0.0	112.9	-
135	26.7	5.8	46.6	0.0	117.2	-
140	26.0	5.6	47.2	0.0	121.5	-
145	25.4	5.5	47.7	0.0	125.9	-
150	24.8	5.3	48.1	0.0	130.2	-
155	24.2	5.2	48.6	0.0	134.6	-
160	23.7	5.1	49.1	0.0	138.9	-



**MODIFIED RATIONAL METHOD
STORAGE CALCULATIONS**

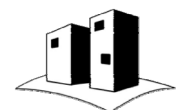
Drainage Area 220	
Area (Ha)	0.082
C ₂	0.42
AC	0.034
T _c (min)	10.0
T incr. (min)	5
Q ₁ (l/s)	7.1
Req. vol. (m ³)	0.0

Picton	2-year
a=	21.2
b=	0
c=	0.699

Notes:

Required Storage Summary

T (min)	I (mm/hr)	Q (l/s)	Total Vol.	Ext. Vol. (m³)	Rel. Vol. (m³)	Storage (m³)
10	74.2	7.1	4.3	0.0	4.3	0.0
15	55.9	5.3	4.8	0.0	6.4	-
20	45.7	4.4	5.2	0.0	8.5	-
25	39.1	3.7	5.6	0.0	10.6	-
30	34.4	3.3	5.9	0.0	12.8	-
35	30.9	3.0	6.2	0.0	14.9	-
40	28.1	2.7	6.5	0.0	17.0	-
45	25.9	2.5	6.7	0.0	19.1	-
50	24.1	2.3	6.9	0.0	21.3	-
55	22.5	2.2	7.1	0.0	23.4	-
60	21.2	2.0	7.3	0.0	25.5	-
65	20.0	1.9	7.5	0.0	27.7	-
70	19.0	1.8	7.6	0.0	29.8	-
75	18.1	1.7	7.8	0.0	31.9	-
80	17.3	1.7	8.0	0.0	34.0	-
85	16.6	1.6	8.1	0.0	36.2	-
90	16.0	1.5	8.2	0.0	38.3	-
95	15.4	1.5	8.4	0.0	40.4	-
100	14.8	1.4	8.5	0.0	42.5	-
105	14.3	1.4	8.6	0.0	44.7	-
110	13.9	1.3	8.8	0.0	46.8	-
115	13.5	1.3	8.9	0.0	48.9	-
120	13.1	1.2	9.0	0.0	51.0	-
125	12.7	1.2	9.1	0.0	53.2	-
130	12.3	1.2	9.2	0.0	55.3	-
135	12.0	1.2	9.3	0.0	57.4	-
140	11.7	1.1	9.4	0.0	59.6	-
145	11.4	1.1	9.5	0.0	61.7	-
150	11.2	1.1	9.6	0.0	63.8	-
155	10.9	1.0	9.7	0.0	65.9	-
160	10.7	1.0	9.8	0.0	68.1	-
165	10.5	1.0	9.9	0.0	70.2	-



MODIFIED RATIONAL METHOD STORAGE CALCULATIONS

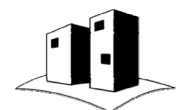
Drainage Area 220	
Area (Ha)	0.082
C ₅	0.42
AC	0.034
T _c (min)	10.0
T incr. (min)	5
Q ₁ (l/s)	9.4
Req. vol. (m ³)	0.0

Picton	5-year
a=	28.2
b=	0
c=	0.699

Notes:

Required Storage Summary

T (min)	I (mm/hr)	Q (l/s)	Total Vol.	Ext. Vol. (m³)	Rel. Vol. (m³)	Storage (m³)
10	98.7	9.4	5.7	0.0	5.7	0.0
15	74.3	7.1	6.4	0.0	8.5	-
20	60.8	5.8	7.0	0.0	11.3	-
25	52.0	5.0	7.5	0.0	14.1	-
30	45.8	4.4	7.9	0.0	17.0	-
35	41.1	3.9	8.3	0.0	19.8	-
40	37.4	3.6	8.6	0.0	22.6	-
45	34.5	3.3	8.9	0.0	25.5	-
50	32.0	3.1	9.2	0.0	28.3	-
55	30.0	2.9	9.5	0.0	31.1	-
60	28.2	2.7	9.7	0.0	33.9	-
65	26.7	2.6	9.9	0.0	36.8	-
70	25.3	2.4	10.2	0.0	39.6	-
75	24.1	2.3	10.4	0.0	42.4	-
80	23.1	2.2	10.6	0.0	45.3	-
85	22.1	2.1	10.8	0.0	48.1	-
90	21.2	2.0	11.0	0.0	50.9	-
95	20.5	2.0	11.1	0.0	53.8	-
100	19.7	1.9	11.3	0.0	56.6	-
105	19.1	1.8	11.5	0.0	59.4	-
110	18.5	1.8	11.7	0.0	62.2	-
115	17.9	1.7	11.8	0.0	65.1	-
120	17.4	1.7	12.0	0.0	67.9	-
125	16.9	1.6	12.1	0.0	70.7	-
130	16.4	1.6	12.3	0.0	73.6	-
135	16.0	1.5	12.4	0.0	76.4	-
140	15.6	1.5	12.5	0.0	79.2	-
145	15.2	1.5	12.7	0.0	82.0	-
150	14.9	1.4	12.8	0.0	84.9	-
155	14.5	1.4	12.9	0.0	87.7	-
160	14.2	1.4	13.0	0.0	90.5	-
165	13.9	1.3	13.2	0.0	93.4	-



**MODIFIED RATIONAL METHOD
STORAGE CALCULATIONS**

Drainage Area 220	
Area (Ha)	0.082
C ₁₀	0.42
AC	0.034
T _c (min)	10.0
T incr. (min)	5
Q ₁ (l/s)	11.0
Req. vol. (m ³)	0.0

Picton	10-year
a=	32.8
b=	0
c=	0.699

Notes:

Required Storage Summary

T (min)	I (mm/hr)	Q (l/s)	Total Vol.	Ext. Vol. (m³)	Rel. Vol. (m³)	Storage (m³)
10	114.8	11.0	6.6	0.0	6.6	0.0
15	86.4	8.3	7.4	0.0	9.9	-
20	70.7	6.8	8.1	0.0	13.2	-
25	60.5	5.8	8.7	0.0	16.5	-
30	53.2	5.1	9.2	0.0	19.7	-
35	47.8	4.6	9.6	0.0	23.0	-
40	43.5	4.2	10.0	0.0	26.3	-
45	40.1	3.8	10.4	0.0	29.6	-
50	37.3	3.6	10.7	0.0	32.9	-
55	34.9	3.3	11.0	0.0	36.2	-
60	32.8	3.1	11.3	0.0	39.5	-
65	31.0	3.0	11.6	0.0	42.8	-
70	29.4	2.8	11.8	0.0	46.1	-
75	28.1	2.7	12.1	0.0	49.4	-
80	26.8	2.6	12.3	0.0	52.7	-
85	25.7	2.5	12.5	0.0	55.9	-
90	24.7	2.4	12.8	0.0	59.2	-
95	23.8	2.3	13.0	0.0	62.5	-
100	23.0	2.2	13.2	0.0	65.8	-
105	22.2	2.1	13.4	0.0	69.1	-
110	21.5	2.1	13.6	0.0	72.4	-
115	20.8	2.0	13.7	0.0	75.7	-
120	20.2	1.9	13.9	0.0	79.0	-
125	19.6	1.9	14.1	0.0	82.3	-
130	19.1	1.8	14.3	0.0	85.6	-
135	18.6	1.8	14.4	0.0	88.9	-
140	18.1	1.7	14.6	0.0	92.1	-
145	17.7	1.7	14.7	0.0	95.4	-
150	17.3	1.7	14.9	0.0	98.7	-
155	16.9	1.6	15.0	0.0	102.0	-
160	16.5	1.6	15.2	0.0	105.3	-
165	16.2	1.5	15.3	0.0	108.6	-



**MODIFIED RATIONAL METHOD
STORAGE CALCULATIONS**

Drainage Area 220	
Area (Ha)	0.08
C ₂₅	0.46
AC	0.04
T _c (min)	10.0
T incr. (min)	5
Q ₁ (l/s)	14.2
Req. vol. (m ³)	0.0

Picton	25-year
a=	38.5
b=	0
c=	0.699

Notes:

Required Storage Summary

T (min)	I (mm/hr)	Q (l/s)	Total Vol.	Ext. Vol. (m³)	Rel. Vol. (m³)	Storage (m³)
10	134.7	14.2	8.5	0.0	8.5	0.0
15	101.5	10.7	9.6	0.0	12.8	-
20	83.0	8.7	10.5	0.0	17.0	-
25	71.0	7.5	11.2	0.0	21.3	-
30	62.5	6.6	11.8	0.0	25.5	-
35	56.1	5.9	12.4	0.0	29.8	-
40	51.1	5.4	12.9	0.0	34.0	-
45	47.1	5.0	13.4	0.0	38.3	-
50	43.7	4.6	13.8	0.0	42.5	-
55	40.9	4.3	14.2	0.0	46.8	-
60	38.5	4.1	14.6	0.0	51.0	-
65	36.4	3.8	14.9	0.0	55.3	-
70	34.6	3.6	15.3	0.0	59.5	-
75	32.9	3.5	15.6	0.0	63.8	-
80	31.5	3.3	15.9	0.0	68.0	-
85	30.2	3.2	16.2	0.0	72.3	-
90	29.0	3.1	16.5	0.0	76.5	-
95	27.9	2.9	16.7	0.0	80.8	-
100	26.9	2.8	17.0	0.0	85.0	-
105	26.0	2.7	17.3	0.0	89.3	-
110	25.2	2.7	17.5	0.0	93.5	-
115	24.4	2.6	17.7	0.0	97.8	-
120	23.7	2.5	18.0	0.0	102.0	-
125	23.0	2.4	18.2	0.0	106.3	-
130	22.4	2.4	18.4	0.0	110.5	-
135	21.8	2.3	18.6	0.0	114.8	-
140	21.3	2.2	18.8	0.0	119.0	-
145	20.8	2.2	19.0	0.0	123.3	-
150	20.3	2.1	19.2	0.0	127.5	-
155	19.8	2.1	19.4	0.0	131.8	-
160	19.4	2.0	19.6	0.0	136.0	-
165	19.0	2.0	19.8	0.0	140.3	-



MODIFIED RATIONAL METHOD STORAGE CALCULATIONS

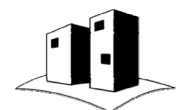
Drainage Area 220	
Area (Ha)	0.08
C ₅₀	0.50
AC	0.04
T _c (min)	10.0
T incr. (min)	5
Q ₁ (l/s)	17.2
Req. vol. (m ³)	0.0

Picton	50-year
a=	42.8
b=	0
c=	0.699

Notes:

Required Storage Summary

T (min)	I (mm/hr)	Q (l/s)	Total Vol.	Ext. Vol. (m³)	Rel. Vol. (m³)	Storage (m³)
10	149.8	17.2	10.3	0.0	10.3	0.0
15	112.8	12.9	11.6	0.0	15.5	-
20	92.2	10.6	12.7	0.0	20.6	-
25	78.9	9.1	13.6	0.0	25.8	-
30	69.5	8.0	14.4	0.0	30.9	-
35	62.4	7.2	15.0	0.0	36.1	-
40	56.8	6.5	15.7	0.0	41.2	-
45	52.3	6.0	16.2	0.0	46.4	-
50	48.6	5.6	16.7	0.0	51.5	-
55	45.5	5.2	17.2	0.0	56.7	-
60	42.8	4.9	17.7	0.0	61.8	-
65	40.5	4.6	18.1	0.0	67.0	-
70	38.4	4.4	18.5	0.0	72.2	-
75	36.6	4.2	18.9	0.0	77.3	-
80	35.0	4.0	19.3	0.0	82.5	-
85	33.6	3.9	19.6	0.0	87.6	-
90	32.2	3.7	20.0	0.0	92.8	-
95	31.0	3.6	20.3	0.0	97.9	-
100	29.9	3.4	20.6	0.0	103.1	-
105	28.9	3.3	20.9	0.0	108.2	-
110	28.0	3.2	21.2	0.0	113.4	-
115	27.2	3.1	21.5	0.0	118.5	-
120	26.4	3.0	21.8	0.0	123.7	-
125	25.6	2.9	22.1	0.0	128.9	-
130	24.9	2.9	22.3	0.0	134.0	-
135	24.3	2.8	22.6	0.0	139.2	-
140	23.7	2.7	22.8	0.0	144.3	-
145	23.1	2.7	23.1	0.0	149.5	-
150	22.6	2.6	23.3	0.0	154.6	-
155	22.0	2.5	23.5	0.0	159.8	-
160	21.6	2.5	23.8	0.0	164.9	-
165	21.1	2.4	24.0	0.0	170.1	-



**MODIFIED RATIONAL METHOD
STORAGE CALCULATIONS**

Drainage Area 220	
Area (Ha)	0.082
C ₁₀₀	0.52
AC	0.043
T _c (min)	10.0
T incr. (min)	5
Q ₁ (l/s)	19.7
Req. vol. (m ³)	0.0

Picton	100-year
a=	47
b=	0
c=	0.699

Notes:

Required Storage Summary

T (min)	I (mm/hr)	Q (l/s)	Total Vol.	Ext. Vol. (m³)	Rel. Vol. (m³)	Storage (m³)
10	164.4	19.7	11.8	0.0	11.8	0.0
15	123.9	14.8	13.3	0.0	17.7	-
20	101.3	12.1	14.5	0.0	23.6	-
25	86.7	10.4	15.5	0.0	29.5	-
30	76.3	9.1	16.4	0.0	35.4	-
35	68.5	8.2	17.2	0.0	41.3	-
40	62.4	7.5	17.9	0.0	47.2	-
45	57.5	6.9	18.5	0.0	53.1	-
50	53.4	6.4	19.1	0.0	59.0	-
55	49.9	6.0	19.7	0.0	64.8	-
60	47.0	5.6	20.2	0.0	70.7	-
65	44.4	5.3	20.7	0.0	76.6	-
70	42.2	5.0	21.2	0.0	82.5	-
75	40.2	4.8	21.6	0.0	88.4	-
80	38.4	4.6	22.1	0.0	94.3	-
85	36.8	4.4	22.5	0.0	100.2	-
90	35.4	4.2	22.9	0.0	106.1	-
95	34.1	4.1	23.2	0.0	112.0	-
100	32.9	3.9	23.6	0.0	117.9	-
105	31.8	3.8	23.9	0.0	123.8	-
110	30.8	3.7	24.3	0.0	129.7	-
115	29.8	3.6	24.6	0.0	135.6	-
120	29.0	3.5	24.9	0.0	141.5	-
125	28.1	3.4	25.2	0.0	147.4	-
130	27.4	3.3	25.5	0.0	153.3	-
135	26.7	3.2	25.8	0.0	159.2	-
140	26.0	3.1	26.1	0.0	165.1	-
145	25.4	3.0	26.4	0.0	171.0	-
150	24.8	3.0	26.6	0.0	176.9	-
155	24.2	2.9	26.9	0.0	182.7	-
160	23.7	2.8	27.2	0.0	188.6	-
165	23.2	2.8	27.4	0.0	194.5	-



MODIFIED RATIONAL METHOD STORAGE CALCULATIONS

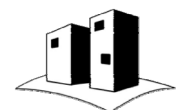
Drainage Area EXT2	
Area (Ha)	0.22
C ₂	0.30
AC	0.07
T _c (min)	10.0
T incr. (min)	5
Q ₁ (l/s)	13.8
Req. vol. (m ³)	0.0

Picton	2-year
a=	21.2
b=	0
c=	0.699

Notes:

Required Storage Summary

T (min)	I (mm/hr)	Q (l/s)	Total Vol.	Ext. Vol. (m³)	Rel. Vol. (m³)	Storage (m³)
10	74.2	13.8	8.3	0.0	8.3	0.0
15	55.9	10.4	9.4	0.0	12.4	-
20	45.7	8.5	10.2	0.0	16.5	-
25	39.1	7.3	10.9	0.0	20.7	-
30	34.4	6.4	11.5	0.0	24.8	-
35	30.9	5.7	12.1	0.0	29.0	-
40	28.1	5.2	12.6	0.0	33.1	-
45	25.9	4.8	13.0	0.0	37.2	-
50	24.1	4.5	13.4	0.0	41.4	-
55	22.5	4.2	13.8	0.0	45.5	-
60	21.2	3.9	14.2	0.0	49.6	-
65	20.0	3.7	14.5	0.0	53.8	-
70	19.0	3.5	14.9	0.0	57.9	-
75	18.1	3.4	15.2	0.0	62.1	-
80	17.3	3.2	15.5	0.0	66.2	-
85	16.6	3.1	15.8	0.0	70.3	-
90	16.0	3.0	16.0	0.0	74.5	-
95	15.4	2.9	16.3	0.0	78.6	-
100	14.8	2.8	16.6	0.0	82.7	-
105	14.3	2.7	16.8	0.0	86.9	-
110	13.9	2.6	17.0	0.0	91.0	-
115	13.5	2.5	17.3	0.0	95.2	-
120	13.1	2.4	17.5	0.0	99.3	-
125	12.7	2.4	17.7	0.0	103.4	-
130	12.3	2.3	17.9	0.0	107.6	-
135	12.0	2.2	18.1	0.0	111.7	-
140	11.7	2.2	18.3	0.0	115.8	-
145	11.4	2.1	18.5	0.0	120.0	-
150	11.2	2.1	18.7	0.0	124.1	-
155	10.9	2.0	18.9	0.0	128.2	-
160	10.7	2.0	19.1	0.0	132.4	-
165	10.5	1.9	19.2	0.0	136.5	-



**MODIFIED RATIONAL METHOD
STORAGE CALCULATIONS**

Drainage Area EXT2	
Area (Ha)	0.22
C ₅	0.30
AC	0.07
T _c (min)	10.0
T incr. (min)	5
Q ₁ (l/s)	18.4
Req. vol. (m ³)	0.0

Picton	5-year
a=	28.2
b=	0
c=	0.699

Notes:

Required Storage Summary

T (min)	I (mm/hr)	Q (l/s)	Total Vol.	Ext. Vol. (m³)	Rel. Vol. (m³)	Storage (m³)
10	98.7	18.4	11.0	0.0	11.0	0.0
15	74.3	13.8	12.4	0.0	16.5	-
20	60.8	11.3	13.6	0.0	22.0	-
25	52.0	9.7	14.5	0.0	27.5	-
30	45.8	8.5	15.3	0.0	33.0	-
35	41.1	7.6	16.1	0.0	38.5	-
40	37.4	7.0	16.7	0.0	44.0	-
45	34.5	6.4	17.3	0.0	49.5	-
50	32.0	6.0	17.9	0.0	55.1	-
55	30.0	5.6	18.4	0.0	60.6	-
60	28.2	5.2	18.9	0.0	66.1	-
65	26.7	5.0	19.3	0.0	71.6	-
70	25.3	4.7	19.8	0.0	77.1	-
75	24.1	4.5	20.2	0.0	82.6	-
80	23.1	4.3	20.6	0.0	88.1	-
85	22.1	4.1	21.0	0.0	93.6	-
90	21.2	4.0	21.3	0.0	99.1	-
95	20.5	3.8	21.7	0.0	104.6	-
100	19.7	3.7	22.0	0.0	110.1	-
105	19.1	3.5	22.3	0.0	115.6	-
110	18.5	3.4	22.7	0.0	121.1	-
115	17.9	3.3	23.0	0.0	126.6	-
120	17.4	3.2	23.3	0.0	132.1	-
125	16.9	3.1	23.5	0.0	137.6	-
130	16.4	3.1	23.8	0.0	143.1	-
135	16.0	3.0	24.1	0.0	148.6	-
140	15.6	2.9	24.4	0.0	154.1	-
145	15.2	2.8	24.6	0.0	159.6	-
150	14.9	2.8	24.9	0.0	165.2	-
155	14.5	2.7	25.1	0.0	170.7	-
160	14.2	2.6	25.4	0.0	176.2	-
165	13.9	2.6	25.6	0.0	181.7	-



**MODIFIED RATIONAL METHOD
STORAGE CALCULATIONS**

Drainage Area EXT2	
Area (Ha)	0.22
C ₁₀	0.30
AC	0.07
T _c (min)	10.0
T incr. (min)	5
Q ₁ (l/s)	21.3
Req. vol. (m ³)	0.0

Picton	10-year
a=	32.8
b=	0
c=	0.699

Notes:

Required Storage Summary

T (min)	I (mm/hr)	Q (l/s)	Total Vol.	Ext. Vol. (m³)	Rel. Vol. (m³)	Storage (m³)
10	114.8	21.3	12.8	0.0	12.8	0.0
15	86.4	16.1	14.5	0.0	19.2	-
20	70.7	13.1	15.8	1.0	25.6	-
25	60.5	11.2	16.9	2.0	32.0	-
30	53.2	9.9	17.8	3.0	38.4	-
35	47.8	8.9	18.7	4.0	44.8	-
40	43.5	8.1	19.4	5.0	51.2	-
45	40.1	7.5	20.1	6.0	57.6	-
50	37.3	6.9	20.8	7.0	64.0	-
55	34.9	6.5	21.4	8.0	70.4	-
60	32.8	6.1	22.0	9.0	76.8	-
65	31.0	5.8	22.5	10.0	83.2	-
70	29.4	5.5	23.0	11.0	89.6	-
75	28.1	5.2	23.5	12.0	96.0	-
80	26.8	5.0	23.9	13.0	102.4	-
85	25.7	4.8	24.4	14.0	108.8	-
90	24.7	4.6	24.8	15.0	115.2	-
95	23.8	4.4	25.2	16.0	121.6	-
100	23.0	4.3	25.6	17.0	128.0	-
105	22.2	4.1	26.0	18.0	134.4	-
110	21.5	4.0	26.4	19.0	140.8	-
115	20.8	3.9	26.7	20.0	147.2	-
120	20.2	3.8	27.1	21.0	153.6	-
125	19.6	3.7	27.4	22.0	160.1	-
130	19.1	3.6	27.7	23.0	166.5	-
135	18.6	3.5	28.0	24.0	172.9	-
140	18.1	3.4	28.3	25.0	179.3	-
145	17.7	3.3	28.6	26.0	185.7	-
150	17.3	3.2	28.9	27.0	192.1	-
155	16.9	3.1	29.2	28.0	198.5	-
160	16.5	3.1	29.5	29.0	204.9	-
165	16.2	3.0	29.8	30.0	211.3	-



**MODIFIED RATIONAL METHOD
STORAGE CALCULATIONS**

Drainage Area EXT2	
Area (Ha)	0.22
C ₂₅	0.33
AC	0.07
T _c (min)	10.0
T incr. (min)	5
Q ₁ (l/s)	27.6
Req. vol. (m ³)	0.0

Picton	25-year
a=	38.5
b=	0
c=	0.699

Notes:

Required Storage Summary

T (min)	I (mm/hr)	Q (l/s)	Total Vol.	Ext. Vol. (m³)	Rel. Vol. (m³)	Storage (m³)
10	134.7	27.6	16.5	0.0	16.5	0.0
15	101.5	20.8	18.7	0.0	24.8	-
20	83.0	17.0	20.4	1.0	33.1	-
25	71.0	14.5	21.8	2.0	41.3	-
30	62.5	12.8	23.0	3.0	49.6	-
35	56.1	11.5	24.1	4.0	57.9	-
40	51.1	10.5	25.1	5.0	66.1	-
45	47.1	9.6	26.0	6.0	74.4	-
50	43.7	8.9	26.8	7.0	82.7	-
55	40.9	8.4	27.6	8.0	90.9	-
60	38.5	7.9	28.4	9.0	99.2	-
65	36.4	7.4	29.0	10.0	107.4	-
70	34.6	7.1	29.7	11.0	115.7	-
75	32.9	6.7	30.3	12.0	124.0	-
80	31.5	6.4	30.9	13.0	132.2	-
85	30.2	6.2	31.5	14.0	140.5	-
90	29.0	5.9	32.0	15.0	148.8	-
95	27.9	5.7	32.6	16.0	157.0	-
100	26.9	5.5	33.1	17.0	165.3	-
105	26.0	5.3	33.6	18.0	173.6	-
110	25.2	5.2	34.0	19.0	181.8	-
115	24.4	5.0	34.5	20.0	190.1	-
120	23.7	4.9	34.9	21.0	198.4	-
125	23.0	4.7	35.4	22.0	206.6	-
130	22.4	4.6	35.8	23.0	214.9	-
135	21.8	4.5	36.2	24.0	223.2	-
140	21.3	4.4	36.6	25.0	231.4	-
145	20.8	4.3	37.0	26.0	239.7	-
150	20.3	4.2	37.4	27.0	248.0	-
155	19.8	4.1	37.7	28.0	256.2	-
160	19.4	4.0	38.1	29.0	264.5	-
165	19.0	3.9	38.4	30.0	272.7	-



MODIFIED RATIONAL METHOD STORAGE CALCULATIONS

Drainage Area EXT2	
Area (Ha)	0.22
C ₅₀	0.36
AC	0.08
T _c (min)	10.0
T incr. (min)	5
Q ₁ (l/s)	33.4
Req. vol. (m ³)	0.0

Picton	50-year
a=	42.8
b=	0
c=	0.699

Notes:

Required Storage Summary

T (min)	I (mm/hr)	Q (l/s)	Total Vol.	Ext. Vol. (m³)	Rel. Vol. (m³)	Storage (m³)
10	149.8	33.4	20.1	0.0	20.1	0.0
15	112.8	25.2	22.7	0.0	30.1	-
20	92.2	20.6	24.7	1.0	40.1	-
25	78.9	17.6	26.4	2.0	50.1	-
30	69.5	15.5	27.9	3.0	60.2	-
35	62.4	13.9	29.2	4.0	70.2	-
40	56.8	12.7	30.4	5.0	80.2	-
45	52.3	11.7	31.5	6.0	90.2	-
50	48.6	10.9	32.6	7.0	100.3	-
55	45.5	10.2	33.5	8.0	110.3	-
60	42.8	9.6	34.4	9.0	120.3	-
65	40.5	9.0	35.2	10.0	130.3	-
70	38.4	8.6	36.0	11.0	140.4	-
75	36.6	8.2	36.8	12.0	150.4	-
80	35.0	7.8	37.5	13.0	160.4	-
85	33.6	7.5	38.2	14.0	170.4	-
90	32.2	7.2	38.9	15.0	180.5	-
95	31.0	6.9	39.5	16.0	190.5	-
100	29.9	6.7	40.1	17.0	200.5	-
105	28.9	6.5	40.7	18.0	210.5	-
110	28.0	6.3	41.3	19.0	220.6	-
115	27.2	6.1	41.8	20.0	230.6	-
120	26.4	5.9	42.4	21.0	240.6	-
125	25.6	5.7	42.9	22.0	250.7	-
130	24.9	5.6	43.4	23.0	260.7	-
135	24.3	5.4	43.9	24.0	270.7	-
140	23.7	5.3	44.4	25.0	280.7	-
145	23.1	5.2	44.8	26.0	290.8	-
150	22.6	5.0	45.3	27.0	300.8	-
155	22.0	4.9	45.8	28.0	310.8	-
160	21.6	4.8	46.2	29.0	320.8	-
165	21.1	4.7	46.6	30.0	330.9	-



**MODIFIED RATIONAL METHOD
STORAGE CALCULATIONS**

Drainage Area EXT2	
Area (Ha)	0.22
C ₁₀₀	0.38
AC	0.08
T _c (min)	10.0
T incr. (min)	5
Q ₁ (l/s)	38.2
Req. vol. (m ³)	0.0

Picton	100-year
a=	47
b=	0
c=	0.699

Notes:

Required Storage Summary

T (min)	I (mm/hr)	Q (l/s)	Total Vol.	Ext. Vol. (m³)	Rel. Vol. (m³)	Storage (m³)
10	164.4	38.2	22.9	0.0	22.9	0.0
15	123.9	28.8	25.9	0.0	34.4	-
20	101.3	23.5	28.3	0.0	45.9	-
25	86.7	20.1	30.2	0.0	57.3	-
30	76.3	17.7	31.9	0.0	68.8	-
35	68.5	15.9	33.4	0.0	80.3	-
40	62.4	14.5	34.8	0.0	91.8	-
45	57.5	13.4	36.1	0.0	103.2	-
50	53.4	12.4	37.2	0.0	114.7	-
55	49.9	11.6	38.3	0.0	126.2	-
60	47.0	10.9	39.3	0.0	137.6	-
65	44.4	10.3	40.3	0.0	149.1	-
70	42.2	9.8	41.2	0.0	160.6	-
75	40.2	9.3	42.1	0.0	172.0	-
80	38.4	8.9	42.9	0.0	183.5	-
85	36.8	8.6	43.7	0.0	195.0	-
90	35.4	8.2	44.4	0.0	206.4	-
95	34.1	7.9	45.2	0.0	217.9	-
100	32.9	7.6	45.9	0.0	229.4	-
105	31.8	7.4	46.6	0.0	240.8	-
110	30.8	7.2	47.2	0.0	252.3	-
115	29.8	6.9	47.8	0.0	263.8	-
120	29.0	6.7	48.5	0.0	275.3	-
125	28.1	6.5	49.1	0.0	286.7	-
130	27.4	6.4	49.6	0.0	298.2	-
135	26.7	6.2	50.2	0.0	309.7	-
140	26.0	6.0	50.8	0.0	321.1	-
145	25.4	5.9	51.3	0.0	332.6	-
150	24.8	5.8	51.8	0.0	344.1	-
155	24.2	5.6	52.3	0.0	355.5	-
160	23.7	5.5	52.8	0.0	367.0	-
165	23.2	5.4	53.3	0.0	378.5	-



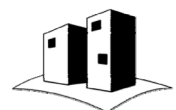
ORIFICE AND AVAILABLE STORAGE CALCULATIONS

$$Q_{orifice} = C_d A (2gh)^{1/2}$$

Type	PLATE
Location	MH1
Size	370 mm
Area	0.108 m ²
C _d	0.62

Drainage Area 210 Orifice Calcs

	Elev. (m)	h (m)	Q (m ³ /s)
Inv.	91.81	0.00	-
MH TOP	94.00	2.19	-
2-Yr W.L.	92.07	0.07	0.081
5-yr W.L.	92.15	0.16	0.116
10-yr W.L.	92.23	0.24	0.143
25-yr W.L.	92.38	0.38	0.183
50-yr W.L.	92.56	0.57	0.222
100-yr W.L.	92.76	0.77	0.258



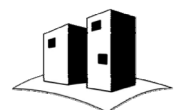
ORIFICE AND AVAILABLE STORAGE CALCULATIONS

$$Q_{orifice} = C_d A (2gh)^{1/2}$$

Type	PLATE
Location	MH1
Size	100 mm
Area	0.008 m ²
C _d	0.62

Drainage Area 211 Orifice Calcs

	Elev. (m)	h (m)	Q (m ³ /s)
Inv.	91.00	0.00	-
MH TOP	92.50	1.50	-
2-Yr W.L.	91.10	0.05	0.005
5-yr W.L.	91.15	0.10	0.007
10-yr W.L.	91.20	0.15	0.008
25-yr W.L.	91.28	0.23	0.010
50-yr W.L.	91.39	0.34	0.013
100-yr W.L.	91.50	0.45	0.014



EFFECTIVE TSS REMOVAL CALCULATIONS

Untreated TSS Removal Summary

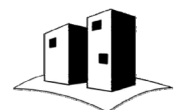
Drainage Area	Surface Type	A (Ha)	Removal Rate	Net for Treatment	Treatment Type	Rate	Effective Removal
210	Asphalt	0.814	0%	100%			0.0%
	Rooftops	0.540	90%	10%			90.0%
	Grass	0.266	100%	0%			100.0%
211	Parkette	0.113	50%	50%			50%
220	Landscape	0.082	50%	50%			50%
Total		1.830					47%

Treated TSS Removal Summary

Drainage Area	Surface Type	A (Ha)	Removal Rate	Net for Treatment	Treatment Type	Rate	Effective Removal
210	Asphalt	0.814	0%	100%	4	80%	80.0%
	Rooftops	0.540	90%	10%	4	80%	98.0%
	Grass	0.266	100%	0%	4	80%	100.0%
211	Parkette	0.113	50%	50%	4	0%	50%
220	Landscape	0.082	50%	50%	3	0%	50%
Total		1.830					84%

Treatment Type Legend:

- 1 - Inherently clean runoff
- 2 - Green roof
- 3 - Untreated
- 4- Filtration system



Project: 24-017 - (ID210) BARKER STREET COPY



Version 1.1

☒ Include Perimeter Stone in Calculations

☐ Click for Stage Area Data

☐ Click to Invert Stage Area Data

[Click Here for Metric](#)

Interpolation Tools

- ☐ Click to Define Top and/or Bottom of storage
- ☐ Click to Define Target Volume & Reference Elevation

Chamber Model -	SC-800
Units -	Imperial
Number of Chambers -	134
Number of End Caps -	18
Voids in the stone (porosity) -	40%
Base of Stone Elevation -	0.00ft
Amount of Stone Above Chambers -	6in
Amount of Stone Below Chambers -	6in
Area of system -	4822sf Min. Area - 4444 sf min. area

StormTech SC-800 Cumulative Storage Volumes								
Height of System (inches)	Incremental Single Chamber (cubic feet)	Incremental Single End Cap (cubic feet)	Incremental Chambers (cubic feet)	Incremental End Cap (cubic feet)	Incremental Stone (cubic feet)	Incremental Ch. EC and Stone (cubic feet)	Cumulative System (cubic feet)	Elevation (feet)
45	0.00	0.00	0.00	0.00	160.73	160.73	11340.12	3.75
44	0.00	0.00	0.00	0.00	160.73	160.73	11179.38	3.67
43	0.00	0.00	0.00	0.00	160.73	160.73	11018.65	3.58
42	0.00	0.00	0.00	0.00	160.73	160.73	10857.91	3.50
41	0.00	0.00	0.00	0.00	160.73	160.73	10697.18	3.42
40	0.00	0.00	0.00	0.00	160.73	160.73	10536.44	3.33
39	0.07	0.00	9.98	0.01	156.74	166.73	10375.71	3.25
38	0.20	0.00	26.36	0.06	150.16	176.59	10208.98	3.17
37	0.29	0.01	38.24	0.11	145.40	183.74	10032.39	3.08
36	0.51	0.01	67.67	0.16	133.60	201.43	9848.64	3.00
35	0.74	0.01	99.24	0.25	120.94	220.43	9647.21	2.92
34	0.89	0.02	119.56	0.44	112.73	232.74	9426.78	2.83
33	1.01	0.03	135.99	0.61	106.10	242.69	9194.05	2.75
32	1.12	0.04	150.09	0.78	100.39	251.26	8951.35	2.67
31	1.21	0.05	162.51	0.95	95.35	258.81	8700.09	2.58
30	1.30	0.06	173.71	1.12	90.80	265.63	8441.28	2.50
29	1.37	0.07	183.88	1.27	86.68	271.82	8175.65	2.42
28	1.44	0.08	193.17	1.41	82.90	277.48	7903.83	2.33
27	1.51	0.09	201.76	1.54	79.41	282.72	7626.34	2.25
26	1.57	0.09	209.76	1.69	76.15	287.61	7343.63	2.17
25	1.62	0.10	217.23	1.84	73.11	292.18	7056.02	2.08
24	1.67	0.11	224.23	1.98	70.25	296.46	6763.84	2.00
23	1.72	0.12	230.80	2.12	67.57	300.49	6467.38	1.92
22	1.77	0.12	236.99	2.23	65.05	304.27	6166.89	1.83
21	1.81	0.13	242.81	2.31	62.69	307.81	5862.63	1.75
20	1.85	0.14	248.31	2.45	60.43	311.19	5554.82	1.67
19	1.89	0.14	253.50	2.57	58.31	314.38	5243.63	1.58
18	1.93	0.15	258.40	2.61	56.33	317.34	4929.25	1.50
17	1.96	0.15	263.04	2.68	54.45	320.17	4611.91	1.42
16	2.00	0.16	267.42	2.81	52.64	322.87	4291.74	1.33
15	2.03	0.16	271.57	2.95	50.93	325.44	3968.87	1.25
14	2.06	0.17	275.49	3.02	49.33	327.84	3643.42	1.17
13	2.08	0.17	279.19	3.08	47.83	330.10	3315.59	1.08
12	2.11	0.18	282.69	3.16	46.39	332.25	2985.49	1.00
11	2.13	0.17	286.00	3.12	45.09	334.21	2653.24	0.92
10	2.16	0.18	289.12	3.27	43.78	336.17	2319.04	0.83
9	2.18	0.18	292.06	3.30	42.59	337.95	1982.87	0.75
8	2.20	0.19	294.83	3.34	41.47	339.64	1644.92	0.67
7	2.22	0.13	297.85	2.38	40.64	340.87	1305.28	0.58
6	0.00	0.00	0.00	0.00	160.73	160.73	964.41	0.50
5	0.00	0.00	0.00	0.00	160.73	160.73	803.67	0.42
4	0.00	0.00	0.00	0.00	160.73	160.73	642.94	0.33
3	0.00	0.00	0.00	0.00	160.73	160.73	482.20	0.25
2	0.00	0.00	0.00	0.00	160.73	160.73	321.47	0.17
1	0.00	0.00	0.00	0.00	160.73	160.73	160.73	0.08

Project: 24-017 - (ID210) BARKER STREET COPY

Chamber Model -	SC-800
Units -	Metric
Number of Chambers -	134
Number of End Caps -	18
Voids in the stone (porosity) -	40
Base of Stone Elevation -	91.66
Amount of Stone Above Chambers -	152
Amount of Stone Below Chambers -	152



Version 1.1

☒ Include Perimeter Stone in Calculations

☐ Click for Stage Area Data

☐ Click to Invert Stage Area Data

Click Here for Imperial

Interpolation Tools

☐

Click to Define Top and/or Bottom of storage

☐

Click to Define Target Volume & Reference Elevation

Area of System- 447.9827974 sq.meters Min. Area - 412.86 sq.meters

StormTech SC-800 Cumulative Storage Volumes								
Height of System (mm)	Incremental Single Chamber (cubic meters)	Incremental Single End Cap (cubic meters)	Incremental Chambers (cubic meters)	Incremental End Cap (cubic meters)	Incremental Stone (cubic meters)	Incremental Ch. EC and Stone (cubic meters)	Cumulative System (cubic meters)	Elevation (meters)
1143	0.000	0.000	0.00	0.00	4.55	4.55	321.12	92.80
1118	0.000	0.000	0.00	0.00	4.55	4.55	316.57	92.78
1092	0.000	0.000	0.00	0.00	4.55	4.55	312.01	92.75
1067	0.000	0.000	0.00	0.00	4.55	4.55	307.46	92.73
1041	0.000	0.000	0.00	0.00	4.55	4.55	302.91	92.70
1016	0.000	0.000	0.00	0.00	4.55	4.55	298.36	92.68
991	0.002	0.000	0.28	0.00	4.44	4.72	293.81	92.65
965	0.006	0.000	0.75	0.00	4.25	5.00	289.09	92.63
940	0.008	0.000	1.08	0.00	4.12	5.20	284.09	92.60
914	0.014	0.000	1.92	0.00	3.78	5.70	278.88	92.57
889	0.021	0.000	2.81	0.01	3.42	6.24	273.18	92.55
864	0.025	0.001	3.39	0.01	3.19	6.59	266.94	92.52
838	0.029	0.001	3.85	0.02	3.00	6.87	260.35	92.50
813	0.032	0.001	4.25	0.02	2.84	7.11	253.48	92.47
787	0.034	0.001	4.60	0.03	2.70	7.33	246.36	92.45
762	0.037	0.002	4.92	0.03	2.57	7.52	239.03	92.42
737	0.039	0.002	5.21	0.04	2.45	7.70	231.51	92.40
711	0.041	0.002	5.47	0.04	2.35	7.86	223.81	92.37
686	0.043	0.002	5.71	0.04	2.25	8.01	215.95	92.35
660	0.044	0.003	5.94	0.05	2.16	8.14	207.95	92.32
635	0.046	0.003	6.15	0.05	2.07	8.27	199.81	92.30
610	0.047	0.003	6.35	0.06	1.99	8.39	191.53	92.27
584	0.049	0.003	6.54	0.06	1.91	8.51	183.14	92.24
559	0.050	0.004	6.71	0.06	1.84	8.62	174.63	92.22
533	0.051	0.004	6.88	0.07	1.78	8.72	166.01	92.19
508	0.052	0.004	7.03	0.07	1.71	8.81	157.30	92.17
483	0.054	0.004	7.18	0.07	1.65	8.90	148.48	92.14
457	0.055	0.004	7.32	0.07	1.60	8.99	139.58	92.12
432	0.056	0.004	7.45	0.08	1.54	9.07	130.60	92.09
406	0.057	0.004	7.57	0.08	1.49	9.14	121.53	92.07
381	0.057	0.005	7.69	0.08	1.44	9.22	112.39	92.04
356	0.058	0.005	7.80	0.09	1.40	9.28	103.17	92.02
330	0.059	0.005	7.91	0.09	1.35	9.35	93.89	91.99
305	0.060	0.005	8.01	0.09	1.31	9.41	84.54	91.96
279	0.060	0.005	8.10	0.09	1.28	9.46	75.13	91.94
254	0.061	0.005	8.19	0.09	1.24	9.52	65.67	91.91
229	0.062	0.005	8.27	0.09	1.21	9.57	56.15	91.89
203	0.062	0.005	8.35	0.09	1.17	9.62	46.58	91.86
178	0.063	0.004	8.43	0.07	1.15	9.65	36.96	91.84
152	0.000	0.000	0.00	0.00	4.55	4.55	27.31	91.81
127	0.000	0.000	0.00	0.00	4.55	4.55	22.76	91.79
102	0.000	0.000	0.00	0.00	4.55	4.55	18.21	91.76
76	0.000	0.000	0.00	0.00	4.55	4.55	13.65	91.74
51	0.000	0.000	0.00	0.00	4.55	4.55	9.10	91.71
25	0.000	0.000	0.00	0.00	4.55	4.55	4.55	91.69

Project: I-017 - (ID211) BARKER STREET COPY COF



Version 1.1

☒ Include Perimeter Stone in Calculations

☐ Click for Stage Area Data

☐ Click to Invert Stage Area Data

[Click Here for Metric](#)

Interpolation Tools

☐ Click to Define Top and/or Bottom of storage
☐ Click to Define Target Volume & Reference Elevation

Chamber Model -

Units -

Number of Chambers -

Voids in the stone (porosity) -

Base of Stone Elevation -

Amount of Stone Above Chambers -

Amount of Stone Below Chambers -

Area of system -

SC-310

Imperial

-

12

40

0.00

6

6

409

%

ft

in

in

sf

Min. Area -

263 sf

min. area

StormTech SC-310 Cumulative Storage Volumes						
Height of System (inches)	Incremental Single Chamber (cubic feet)	Incremental Total Chamber (cubic feet)	Incremental Stone (cubic feet)	Incremental Ch & St (cubic feet)	Cumulative Chamber (cubic feet)	Elevation (feet)
28	0.00	0.00	13.64	13.64	488.15	2.33
27	0.00	0.00	13.64	13.64	474.51	2.25
26	0.00	0.00	13.64	13.64	460.88	2.17
25	0.00	0.00	13.64	13.64	447.24	2.08
24	0.00	0.00	13.64	13.64	433.60	2.00
23	0.00	0.00	13.64	13.64	419.96	1.92
22	0.06	0.71	13.36	14.06	406.32	1.83
21	0.15	1.86	12.90	14.75	392.26	1.75
20	0.27	3.19	12.36	15.55	377.51	1.67
19	0.54	6.54	11.02	17.56	361.95	1.58
18	0.70	8.45	10.26	18.71	344.39	1.50
17	0.82	9.89	9.68	19.58	325.69	1.42
16	0.92	11.09	9.20	20.30	306.11	1.33
15	1.01	12.18	8.77	20.95	285.81	1.25
14	1.09	13.13	8.38	21.52	264.87	1.17
13	1.15	13.85	8.10	21.95	243.35	1.08
12	1.21	14.58	7.81	22.39	221.40	1.00
11	1.27	15.30	7.52	22.82	199.01	0.92
10	1.32	15.89	7.28	23.18	176.20	0.83
9	1.36	16.38	7.09	23.47	153.02	0.75
8	1.40	16.86	6.89	23.75	129.55	0.67
7	1.43	17.22	6.75	23.97	105.80	0.58
6	0.00	0.00	13.64	13.64	81.83	0.50
5	0.00	0.00	13.64	13.64	68.19	0.42
4	0.00	0.00	13.64	13.64	54.55	0.33
3	0.00	0.00	13.64	13.64	40.92	0.25
2	0.00	0.00	13.64	13.64	27.28	0.17
1	0.00	0.00	13.64	13.64	13.64	0.08

Project: -017 - (ID211) BARKER STREET COPY COI

Chamber Model -	SC-310
Units -	Metric
	-
Number of chambers -	12
Voids in the stone (porosity) -	40
Base of Stone Elevation -	90.85
Amount of Stone Above Chambers -	152
Amount of Stone Below Chambers -	152

Area of System- 38.01194863 sq.meters Min. Area - 24.48 sq.meters



Version 1.1

☒ Include Perimeter Stone in Calculations

☐ Click for Stage Area Data

☐ Click to Invert Stage Area Data

[Click Here for Imperial](#)

Interpolation Tools

- ☐
- Click to Define Top and/or Bottom of storage
- ☐
- Click to Define Target Volume & Reference Elevation

StormTech SC-310 Cumulative Storage Volumes						
Height of System (mm)	Incremental Single Chamber (cubic meters)	Incremental Total Chamber (cubic meters)	Incremental Stone (cubic meters)	Incremental Ch & St (cubic meters)	Cumulative Chamber (cubic meters)	Elevation (meters)
711	0.000	0.000	0.39	0.39	13.82	91.56
686	0.000	0.000	0.39	0.39	13.44	91.54
660	0.000	0.000	0.39	0.39	13.05	91.51
635	0.000	0.000	0.39	0.39	12.66	91.49
610	0.000	0.000	0.39	0.39	12.28	91.46
584	0.000	0.000	0.39	0.39	11.89	91.43
559	0.002	0.020	0.38	0.40	11.51	91.41
533	0.004	0.053	0.37	0.42	11.11	91.38
508	0.008	0.090	0.35	0.44	10.69	91.36
483	0.015	0.185	0.31	0.50	10.25	91.33
457	0.020	0.239	0.29	0.53	9.75	91.31
432	0.023	0.280	0.27	0.55	9.22	91.28
406	0.026	0.314	0.26	0.57	8.67	91.26
381	0.029	0.345	0.25	0.59	8.09	91.23
356	0.031	0.372	0.24	0.61	7.50	91.21
330	0.033	0.392	0.23	0.62	6.89	91.18
305	0.034	0.413	0.22	0.63	6.27	91.15
279	0.036	0.433	0.21	0.65	5.64	91.13
254	0.038	0.450	0.21	0.66	4.99	91.10
229	0.039	0.464	0.20	0.66	4.33	91.08
203	0.040	0.477	0.20	0.67	3.67	91.05
178	0.041	0.487	0.19	0.68	3.00	91.03
152	0.000	0.000	0.39	0.39	2.32	91.00
127	0.000	0.000	0.39	0.39	1.93	90.98
102	0.000	0.000	0.39	0.39	1.54	90.95
76	0.000	0.000	0.39	0.39	1.16	90.93
51	0.000	0.000	0.39	0.39	0.77	90.90
25	0.000	0.000	0.39	0.39	0.39	90.88

FIRST DEFENSE® HIGH CAPACITY DESIGN SUMMARY



PROJECT INFORMATION

Reference	OGS 1
Site	24-017 - Barker Street
Designer	Kara St. Hillaire
Date	6/25/2026 7:17 PM

DESIGN INPUTS

Regulatory Agency	80% TSS (110 μ m)
Water Quality Flow Rate (l/s)	258.3

DESIGN OUTPUTS

Product	10-ft DIAMETER FIRST DEFENSE HIGH CAPACITY
Unit Reference	FD-10HC
* Approved for use in 80% TSS (110 μ m)	

UNIT WEIGHTS AND DIMENSIONS

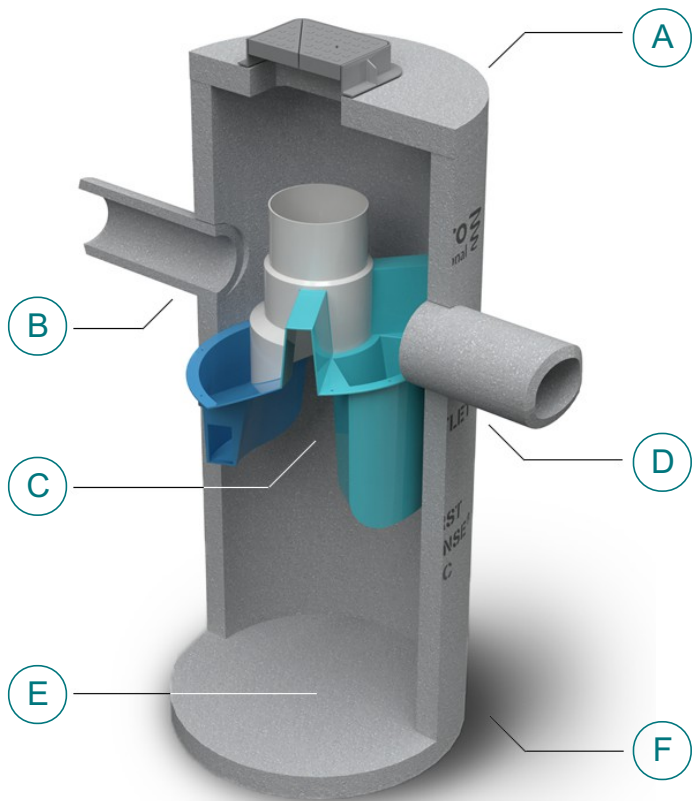
(A) Unit Size (m)	3.05
(B) Inlet Pipe Size (mm)	450
(D) Outlet Pipe Size (mm)	450
(F) Unit Depth (m)	5.35
Inlet Invert Elevation (m)	3.12
Outlet Invert Elevation (m)	91.70

PERFORMANCE AND HYDRAULICS

Max. Treatment Flow Rate (l/s)	332.723
Hydraulic Capacity Flow Rate (l/s)	258.3
Typical Operating Headloss (mm)	0
Maximum Headloss (mm)	0

STORAGE

(C) Oil Storage Capacity (l)	6594
(E) Min.Sediment Storage Capacity (m³)	3.3



VOLUME CONTROL CALCULATIONS

Pre-dev Imperviousness		Post-dev Imperviousness	
Area	C	Area	C
2.038	0.53	2.038	0.72

Increased
Imperviousness=
Area of increased
Imperviousness
over entire site=

$$0.72 - 0.53 = 0.19$$

$$0.19 \times 2.038 = 0.381$$

Runoff Volume Summary

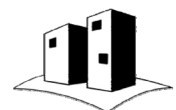
Surface type	A (Ha)	Depth (mm)	Vol. (m ³)	IA depth (mm)	IA Vol. (m ³)	Runoff Vol. (m ³)
Impervious	0.381	12.5	47.7	0	0.0	47.7
Total	0.381		47.7		0.0	47.7

**Area of
system (m²):** 448

**Stone Below
System (m):** 0.3

Voids: 40%

**Volume
Available to
be Infiltrated:** 53.8



Appendix C

Sanitary Data

SANITARY FLOW CALCULATIONS

Entire Development (Buildings A, B, C & D)

Office GFA		0 m ²
Population Equivalent	3.3 p/100m ² GFA	0 persons

Commercial Flow Determination

Commercial GFA (Hub)	1,913 m ²
Average Wastewater Flow	180,000 L/GFA Ha/d
Proposed Commercial Flow	0.40 L/s

Residential Flow Determination

	<u>Unit type</u>	<u>No. Unit</u>	<u>Pop. / Unit</u>	<u>Population</u>
	1-Bdrm	144	2.0	288
	2-Bdrm	45	3.0	135
	3-Bdrm	7	2.4	17
	Total	196		440 persons
Harmon Peaking Factor				4.2
Average flow				320 L/c/d
Proposed Residential Peak Flow				6.8 L/s

I/I Flow Determination

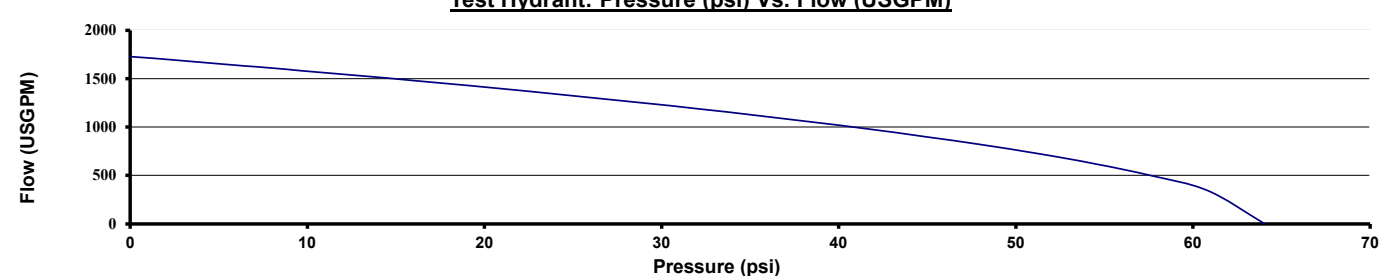
Site Area	1.82 ha
Infiltration (24,192 L/day/ha or 0.28 L/s/ha)	0.51 L/s

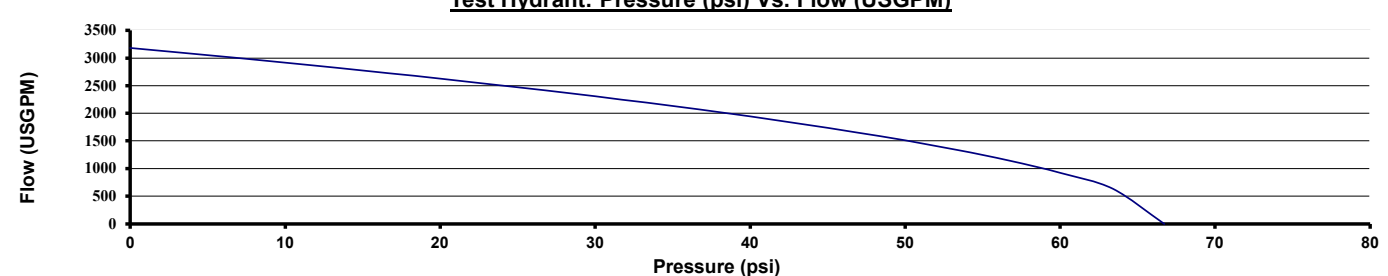
Total Proposed Peak Flow	7.7 L/s
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Appendix D

Water Data

DS1004: Fire Flow Test Report							
Document Type:		Datasheet					
Category:		Drinking Water					
Date of Fire Flow Testing		October 9th, 2025					
Field Operator(s)		Jesse Thomas, Jeff Brooks					
Facility Operator(s)		Core-Lee Creighton					
Notification to Facility Operator:		Y ☐	N ☐	Initial:	JT	Signature:	Jesse Thomas
DWS Information							
High Lift Pump (HLP) On or Off?:		On ☐	Off ☐	Verified By (Initial):		JT	
High Level Reservoir (HLR) Level (m):		2.8		Verified By (Initial):		JT	
Bloomfield Tower Level (m):		N/A		Verified By (Initial):		JT	
Test Hydrant Information							
Hydrant Number:		1099					
Location:		Barker Street					
Test Number:		1					
N.F.P.A. Colour Code:		Green					
Static Pressure:		64.05					
Residual Pressure:		51.98					
Validation: Pressure Drop Greater Than 10%?		Y/N:	Y	Actual Value:		18.8	
Logger S/N:		43180737					
Flow Hydrant Information							
Hydrant No.	Ports Flowed No.	Logger No.	Outlet Dia. (in.)	Coefficient (~0.9)	Pitot Pressure Reading (psi)	Flow (USGPM)	
1098	2	206362	2.5	0.9	6.26	703	
Total Flow (USGPM)						703	
Test Hydrant Available Flow							
Test Hydrant at 20 psi			1414	USGPM	1169	IGPM	
Test Hydrant at 10 psi			1580	USGPM	1305	IGPM	
<u>Test Hydrant: Pressure (psi) Vs. Flow (USGPM)</u>							
							
Comments/Discrepancies/Diagram							
Existing Colour Coding:		Blue					
Recommended Colour Coding		Green					
Acknowledgement							
Operator Overseeing Fire Flow Testing:				Jesse Thomas			
Date:				October 9th, 2025			

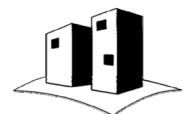
DS1004: Fire Flow Test Report							
Document Type:		Datasheet					
Category:		Drinking Water					
Date of Fire Flow Testing		October 9th, 2025					
Field Operator(s)		Jesse Thomas, Jeff Brooks					
Facility Operator(s)		Core-Lee Creighton					
Notification to Facility Operator:		Y ☐	N ☐	Initial:	JT	Signature:	Jesse Thomas
DWS Information							
High Lift Pump (HLP) On or Off?:		On ☐	Off ☐	Verified By (Initial):		JT	
High Level Reservoir (HLR) Level (m):		2.74		Verified By (Initial):		JT	
Bloomfield Tower Level (m):		N/A		Verified By (Initial):		JT	
Test Hydrant Information							
Hydrant Number:		1084					
Location:		Centre Street					
Test Number:		1					
N.F.P.A. Colour Code:		Blue					
Static Pressure:		66.73					
Residual Pressure:		49.11					
Validation: Pressure Drop Greater Than 10%?		Y/N:	Y	Actual Value:		26.4	
Logger S/N:		43180737					
Flow Hydrant Information							
Hydrant No.	Ports Flowed No.	Logger No.	Outlet Dia. (in.)	Coefficient (~0.9)	Pitot Pressure Reading (psi)	Flow (USGPM)	
1085	2	206362	2.5	0.9	30.5	1552	
Total Flow (USGPM)						1552	
Test Hydrant Available Flow							
Test Hydrant at 20 psi			2628	USGPM	2172	IGPM	
Test Hydrant at 10 psi			2918	USGPM	2412	IGPM	
<u>Test Hydrant: Pressure (psi) Vs. Flow (USGPM)</u>							
							
Comments/Discrepancies/Diagram							
Existing Colour Coding:		Blue					
Recommended Colour Coding		Blue					
Acknowledgement							
Operator Overseeing Fire Flow Testing:				Jesse Thomas			
Date:				October 9th, 2025			

**PROPOSED DOMESTIC FLOW
CALCULATION WORKSHEET**

Residential Use				
Unit Type	No. of Units	PPU	L/c/d	Avg. Day (L/d)
Studios	47	1.4	320	21,056
1B/1B+D	110	1.4	320	49,280
2B/2B+D	45	2.1	320	30,240
3B/3B+D	7	3.1	320	6,944
Semis	0	3.0	320	0
Towns	0	2.5	320	0
Residential Use Avg. Day (L/d)				107,520

Peak Flows*		
Criteria	Peaking Factor	Flow
Avg. day (L/s)	1.00	1.2
Min (L/s)	0.84	1.0
Max Hr (L/hr)	0.90	4,032
Max Day (L/d)	1.10	118,272

* Peaking factors per Table 3.1 of the MOE Guidelines for Drinking-Water



WATERMAIN SIZING AND HEADLOSS CALCULATION WORKSHEET

Fire Watermain Sizing and Headloss Calculation

P (kPa)	EL. (m)	HGL (m)	Q (m ³ /s)	D (mm)	A (m ²)	V (m/s)	Fitting	L (m)	K (unitless)	H _f (kPa)	H _L (m)	EL. (m)	HGL (m)	P (kPa)	P (PSI)
460.1	92.3	139.15	0.135	200	0.031	4.3	-	11.6			1.50	92.3	137.65	445.1	64.6
							45° Elbow		0.35	0.327				444.8	64.5
444.8	92.3	137.62	0.135	200	0.031	4.3	-	37.6			4.86	92.3	132.76	396.9	57.6
NODE 1															
FROM NODE 1 to HYDRANT															
							Branch		1.00	0.935				395.9	57.4
395.9	92.3	132.66	0.135	200	0.031	4.3	-	7.6			0.98	92.3	131.68	386.3	56.0
							Branch		1.00	0.935				385.4	55.9
385.4	92.3	131.58	0.135	150	0.018	7.6	-	12.8			6.70	92.3	124.88	319.6	46.4
FROM NODE 1 to BLDG A															
							In line T		0.35	0.327				396.5	57.5
396.5	92.3	132.72	0.135	200	0.031	4.3	-	9.4			1.22	92.3	131.51	384.6	55.8
							90° Elbow		1.10	1.029				383.6	55.6
383.6	92.3	131.40	0.135	200	0.031	4.3	-	6.9			0.89	92.3	130.51	374.8	54.4
							In line T		0.35	0.327				374.5	54.3
374.5	92.3	130.48	0.135	200	0.031	4.3	-	1.5			0.19	92.3	130.28	372.6	54.0
FROM NODE 1 to BLDG C															
							In line T		0.35	0.327				396.5	57.5
396.5	92.3	132.72	0.135	200	0.031	4.3	-	6.0			0.78	92.3	131.95	388.9	56.4
							45° Elbow		0.35	0.327				388.6	56.4
388.6	92.3	131.91	0.135	200	0.031	4.3	-	31.0			4.01	92.3	127.90	349.3	50.7
							Branch		1.00	0.935				348.3	50.5
348.3	92.3	127.81	0.135	200	0.031	4.3	-	18.0			2.33	92.3	125.48	325.5	47.2
							In line T		0.35	0.327				325.2	47.2
325.2	92.3	125.45	0.135	200	0.031	4.3	-	2.0			0.26	92.3	125.19	322.6	46.8

WATERMAIN SIZING AND HEADLOSS CALCULATION WORKSHEET

FROM BLDG C BRANCH to BLDG A

							In line T		0.35	0.327					349.0	50.6
349.0	92.3	127.87	0.135	200	0.031	4.3		7.0			0.91	92.3	126.97		340.1	49.3
							Branch		1.00	0.935					339.1	49.2
339.1	92.3	126.87	0.135	200	0.031	4.3	-	16.0			2.07	92.3	124.80		318.8	46.2
							45° Elbow		0.35	0.327					318.5	46.2
318.5	92.3	124.77	0.135	200	0.031	4.3	-	25.0			3.23	92.3	121.54		286.8	41.6
							In line T		0.35	0.327					286.5	41.6
286.5	92.3	121.50	0.135	200	0.031	4.3	-	2.0			0.26	92.3	121.24		283.9	41.2

FROM BLDG A BRANCH TO HYDRANT

							In line T		0.35	0.327					339.7	49.3
339.7	92.3	126.93	0.135	200	0.031	4.3		24.0			3.10	92.3	123.83		309.3	44.9
							Branch		1.00	0.935					308.4	44.7
308.4	92.3	123.73	0.135	150	0.018	7.6		16.0			8.37	92.3	115.36		226.2	32.8

FROM BLDG A BRANCH TO BLDG D

							In line T		0.35	0.327					339.7	49.3
339.7	92.3	126.93	0.135	200	0.031	4.3	-	24.0			3.10	92.3	123.83		309.3	44.9
							In line T		0.35	0.327					309.0	44.8
309.0	92.3	123.80	0.135	200	0.031	4.3	-	27.0			3.49	92.3	120.31		274.7	39.8
							90° Elbow		1.10	1.029					273.7	39.7
273.7	92.3	120.20	0.135	200	0.031	4.3	-	18.0			2.33	92.3	117.87		250.9	36.4
							In line T		0.35	0.327					250.5	36.3
250.5	92.3	117.84	0.135	200	0.031	4.3		2.0			0.26	92.3	117.58		248.0	36.0

WATERMAIN SIZING AND HEADLOSS CALCULATION WORKSHEET

Domestic Watermain Sizing

Use	Q _{avg day} (L/s)	Q _{min} (L/s)	Q _{max} (L/s)	Q _{min} (m ³ /s)	Q _{max} (m ³ /s)	Dia. (mm)	A (m ²)	V _{min} (m/s)	V _{max} (m/s)
Res. I/C/I	1.24 -	1.05 -	1.12 -	0.001 -	0.001 -	100	0.01	0.13	0.14
Total	1.24	1.05	1.12	0.00	0.00				

Volume of Watermain (BLDG D Worst Case)

Dia (mm)	Area (m ²)	Length (m)	Volume (m ³)	Volume (L)
200	0.03	161.0	5.058	5058.0
150	0.02	3.0	0.053	53.0
Total watermain volume			5.111	5,111.0

1.14 Hours for water turnover

68.45 Minutes for water turnover

FIRE FLOW CALCULATION WORKSHEET

PROJECT INFORMATION		
Address	35 Barker Street Picton, ON 	Notes: Based on ICF walls and precast concrete foors (4hr rating) A=Floor2 + (1/4 Floor1 + 1/4 Floor3)
NBC Occupancy		
Building Footprint		
No. of Storeys	3-storey building	

BASE FLOW CALCULATION				CREDITS	CHARGES	Q (L/min)
A=	Effective area		3,012 m ²			
C=	Non-combustible		0.8			
F=	Required fire flow	$F=220C\sqrt{A}$	9,659 L/min.			
"F" Rounded to nearest 1,000			10,000 L/min.			10,000
FLOW 'F' ADJUSTMENTS				CREDITS	CHARGES	Q (L/min)
Occupancy Adjustments (F')	%					
Limited combustible	-15%		-1,500	-1,500		8,500
Exposure Adjustments (E)						
Exposure	Sep. (m)	Charge				
N	41	5%				
E	26	10%				
S	15	15%				
W	43	5%				
E = Total Exposure Charge		35%	2,975		2,975	11,475
Sprinkler Adjusments (S)						
Sprinklered as per NFPA 13	Yes		-2,550	-2550		8,925
Standard Water Supply	Yes		-850	-850		8,075
Fully supervised watersupply	No		0			8,075
REQUIRED FLOW (F"=F'+E+S)			(L/min)			8,075
			(USGPM)			2,133



**MUNICIPAL SUPPLY
CALCULATION WORKSHEET**

Hydrant Flow Test Input

Location	Test No.	P _s (PSI)	P _r (PSI)	Q _r (USGPM)
Barker and Charles	1	64.05	51.98	703
	2	66.73	49.11	1552

Theoretical Flow Calculation

Location	Test No.	P _f (PSI)	Q _f (USGPM)
Barker and Charles	1	20	1,414
	2	20	2,628

Where $Q_f = Q_r \left[\frac{P_s - P_f}{P_s - P_r} \right]^{0.54}$

Max Day + Fire Check

Max Day (USGPM)	F'' (USGPM)	Max Day + F'' (USGPM)	Q ₂₀ (USGPM)	Check
22	2,133	2,155	2,628	OK



Appendix E

Engineering Drawings