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Functional Servicing and Stormwater Management Report

The Woolverton
13 Mountain Street and
19 to 23 Elm Street, Grimsby

Woolverton Holdings Corp.

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13 Mountain Street and
19 to 23 Elm Street, Grimsby

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R.J. Burnside & Associates Limited
1465 Pickering Parkway Suite 200
Pickering ON L1V 7G7 CANADA

March 2026
300053081.0000

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Record of Revisions

Revision	Date	Description
0	May 16, 2025	OPA/ZBA Submission to the Town of Grimsby
1	March 16, 2026	OPA/ZBA Resubmission to the Town of Grimsby

R.J. Burnside & Associates Limited

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Disclaimer

1.0 Introduction

R.J. Burnside & Associates Limited (Burnside) are the Consulting Engineers retained by Woolverton Holdings Corp. to prepare a Functional Servicing and Stormwater Management Report in support of an Official Plan and Zoning By-law Amendment application for the re-development of 13 Mountain Street and 19 to 23 Elm Street in the town of Grimsby (the Site).

2.0 Background

The Site is 4,710 m^2 in area and is presently occupied by four 2-storey buildings at 13 Mountain Street and 19, 21, and 23 Elm Street, as well as an ancillary 2-storey building and a 1-storey building to the rear of the property. The Site is anticipated to include a proposed future road widening along Mountain Street, which will reduce the proposed site area to 4,513 m^2. The Site is bound by an existing 2-storey commercial building (11 Mountain Street) to the north, a municipally-owned laneway and parking area to the northeast (Balsam Lane), an existing 1-storey commercial building (25 Elm Street) to the east, Elm Street to the south, and Mountain Street to the west.

The Site is located in an area that is well established and serviced by a network of existing municipal infrastructure including roads, sewer, watermains, and other services and utilities. Refer to Figure 1 for the site location in context to the surrounding area.

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Client

WOOLVERTON HOLDINGS CORP.

180 BLOOR STREET WEST, SUITE 701
TORONTO, ON
M5S 1T6

Drawing Title

THE WOOLVERTON
13 MOUNTAIN STREET & 19-23 ELM STREET, GRIMBSY, ON L3M 3J7

SITE LOCATION PLAN

Drawn	Checked	Date	Drawing No.
GP	AK	21/04/21	**FIG1**
Scale		Project No.	
N.T.S.		300053081	

2.1 Proposed Development

The proposed development will maintain portions of the two existing buildings at 13 Mountain Street and 19 Elm Street. The two buildings are proposed to be used for residential and non-residential purposes, respectively. The proposed development will consist of a 7-storey residential building with 150 residential units, and 278 m^2 of commercial use. There will be an underground parking level constructed below grade for the proposed building. Vehicular access to the proposed underground parking will be provided via Mountain Street. Refer to the Project Statistics and Architectural Site Plan in Appendix A for the proposed site, prepared by Studio JCI (dated March 13, 2026).

2.1.1 Ownership Structure

The proposed development will support both commercial and residential uses. The Owner intends to maintain sole ownership of the Site.

3.0 Water Servicing

3.1 Existing Water Infrastructure

Based upon the drawings provided by the Town of Grimsby (Town) and the survey information (topographic and underground) provided for the Site, the municipal water infrastructure in the vicinity of the Site includes an existing 250 mm diameter watermain on the west side of Mountain Street and an existing 150 mm diameter watermain on the north side of Elm Street. Refer to Drawing S1 for the existing watermain infrastructure surrounding the Site.

3.2 Proposed Water Servicing

3.2.1 New Connections

The proposed water service connection for the development will be via a connection to the existing 250 mm diameter watermain within the Mountain Street right-of-way.

The proposed building will be serviced with a 200 mm diameter fire connection and a 150 mm diameter domestic supply connection.

3.2.2 Water Demand

The proposed fire demand for the development was calculated based on the criteria outlined by the Fire Underwriters Survey (FUS). The proposed domestic demands for the development were calculated using the Niagara Region 2021 Water and Wastewater Master Servicing Plan Update (Volume 3) (GM BluePlan Engineering Limited, dated December 5, 2023), which specifies residential, and employment demands of 240 L/cap/day and 270 L/cap/day, respectively, based on a calculated population. See Section 5.0 and Appendix E of this report for population calculations based on proposed commercial area and unit counts.

The anticipated domestic flow for the development under proposed conditions has been calculated as 3.07 L/s for the maximum hourly demand and 1.30 L/s for the maximum daily demand, based on the criteria provided in the 2021 Water and Wastewater Master Servicing Plan Update (Volume 3). Detailed calculations are provided in Appendix B.

The required fire flow was calculated to be 3,091 USGPM (195 L/s) based on the guidelines outlined in the FUS. The minimum required residual pressure at the fire flow is 210 KPa (30 psi), as per the Niagara Region Water Wastewater Project Design Manual (July 2023). Refer to detailed calculations provided in Appendix B.

Hydrant flow testing has been completed on the existing 250 mm watermain on Mountain Street to verify that water pressures and flows are adequate to supply the

maximum domestic and fire demand required for the proposed development, and to show that the minimum required fire flows can be met for this development. A test was completed by Troy Life & Fire Safety Ltd. (March 2025) in accordance with NFPA 291 Guidelines on the hydrant located on Mountain Street in front of 19 Elm Street.

Based on the results of the hydrant flow testing (see Appendix B for results), it is estimated that at the required fire flow and maximum daily demand of 196.3 L/s, the watermain will operate at a pressure of 31.1 psi. This is above the minimum required pressure of 30 psi. Therefore, based on the results of the hydrant flow test, the existing 250 mm watermain on Mountain Street provides sufficient flow to service the development. Refer to Appendix B for detailed water demand calculations.

3.2.3 Hydrant Coverage

There is an existing fire hydrant on the north side Elm Street, just west of the intersection with Mountain Street and an existing fire hydrant on the west side of Mountain Street, approximately 10 m north of the Site. The first is located on the north side of Elm Street (east of Mountain Street), in front of the proposed site. The second is located on the east side of Mountain Street (north of Elm Street), in front of the existing Woolverton House building. The Siamese connection (Fire Department Connection) has been located on the face of the building, within the maximum allowable distance from a fire hydrant of 45 m, thereby satisfying the Ontario Building Code (OBC) requirement.

Refer to Drawing S1 for fire hydrant location details.

4.0 Stormwater Management

4.1 Existing Storm Sewer Infrastructure

Based upon existing Town records and survey information, there is an existing 600 mm diameter storm sewer on the south side of Elm Street and there are no storm sewers on Mountain Street across the frontage of the Site. Through site investigations, it was determined that the existing catchbasins on site capture and convey drainage via an existing 300 mm diameter storm sewer through the adjacent municipal parking lot / laneway, prior to discharge to the existing storm sewer network located on Balsam Lane (located northeast of the Site).

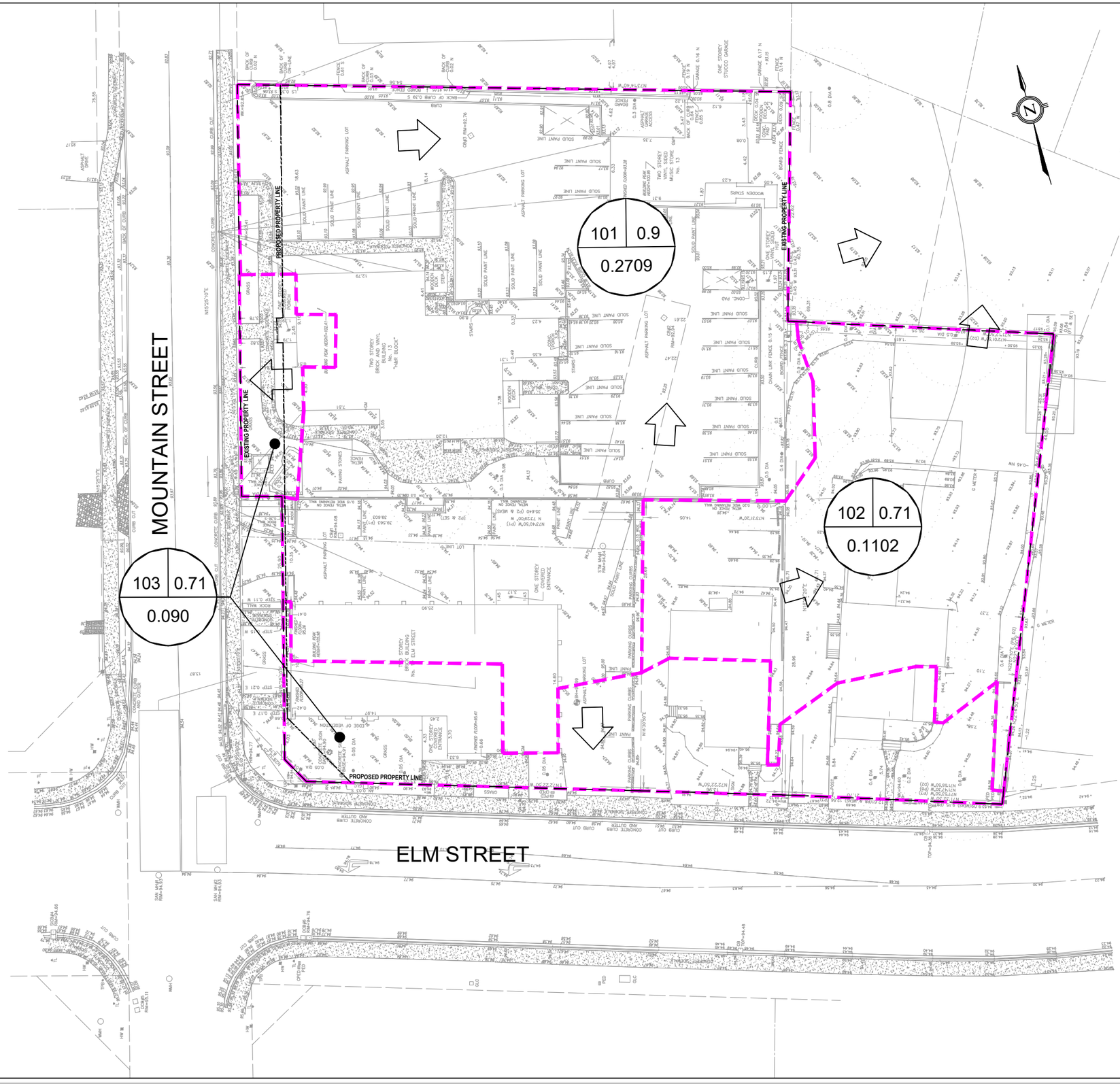
A CCTV investigation of the existing storm sewer was completed to verify the alignment and condition of the existing 300 mm storm sewer connection to Balsam Lane. Based on the results of the CCTV investigation, two areas of concern in the existing 300 mm storm sewer were identified. These areas of concern include a break in the existing pipe and a buildup of deposits. Both the break in the existing pipe and buildup of deposits are in the first 20 m of sewer (located immediately downstream of the Site) and which are proposed to be removed as part of the proposed development. The remainder of the storm sewer will provide a suitable outlet for the site and the CCTV investigation verifies the current outlet for the majority of the storm drainage from the site to the storm sewer network in Balsam Lane. Refer to Appendix C for a copy of the CCTV investigation. Refer to Drawing S1 for locations of the existing storm sewer infrastructure.

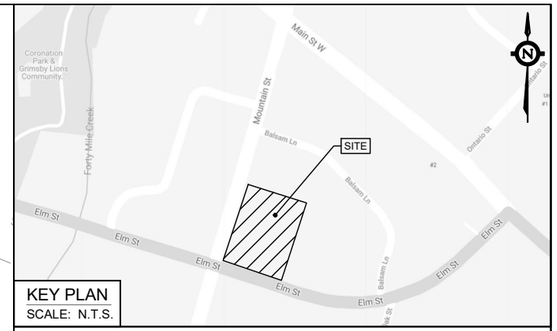
4.2 Existing Drainage Conditions

There is an existing storm sewer network on the Site that captures and conveys most of the parking area and, as mentioned above, includes the 300 mm diameter storm sewer connection to the existing storm sewer network on Balsam Lane (Drainage Area 101 on Figure 2). Drainage from a portion of the Site (Area 102) sheetflows uncontrolled to Balsam Lane and the existing storm sewer network. A small portion of the Site fronting on to Elm Street and Mountain Street also sheetflows uncontrolled to the right-of-way and is collected within the existing municipal storm sewer infrastructure on Elm Street and Mountain Street (Drainage Area 103 on Figure 2). Refer to Figure 2 for the existing drainage conditions and Table 1 below for the area breakdowns. Refer to Appendix D for calculations.

Table 1: Existing Storm Drainage

Area Description	Catchment	Area (m^2)	C	Q (2-Year)	Q (100-Year)
On-site Capture (Balsam Lane Drainage)	101	2,709	0.90	45.7 L/s	95.7 L/s
Sheetflow Drainage to Balsam Lane	102	1,102	0.70	14.4 L/s	30.1 L/s
Total Drainage to Balsam Lane		**3,811**		**60.1 L/s**	**125.8 L/s**
Sheetflow Drainage to Mountain Street and Elm Street	103	899	0.71	12.0 L/s	25.1 L/s
Total Drainage to Mountain Steet and Elm Street		**899**		**12.0 L/s**	**25.1 L/s**
Total Drainage from Site		**4710**		**72.1 L/s**	**150.9 L/s**





KEY PLAN
SCALE: N.T.S.

Notes

1. This drawing is the exclusive property of R. J. Burnside & Associates Limited. The reproduction of any part without prior written consent of this office is strictly prohibited.
2. The contractor shall verify all dimensions, levels, and datums on site and report any discrepancies or omissions to this office prior to construction.
3. This drawing is to be read and understood in conjunction with all other plans and documents applicable to this project.

LEGEND:

- EXISTING PROPERTY LINE
- PROPOSED PROPERTY LINE
- DRAINAGE BOUNDARY
- OVERLAND FLOW ROUTE
- DRAINAGE AREA NUMBER
- % IMPERVIOUS
- DRAINAGE AREA (ha)

SITE | 0.90
1.14 ha

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THE WOOLVERTON
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GRIMSBY, ON L3M 3J7

EXISTING CONDITIONS PLAN

Drawn	Checked	Date	Drawing No.
GP	MC	21/04/21	FIG2
Scale		Project No.	
1:400		300053081	

File Name: 053081 - FIG2.dwg Date Plotted: May 15, 2025 - 1:34 PM

4.3 Stormwater Management Design Criteria

The stormwater management criteria for this development are based on the *Niagara Peninsula Conservation Authority (NPCA) Stormwater Management Guidelines (approved by the NPCA Board on March 17, 2010)* as outlined below.

4.3.1 Water Quantity

Stormwater quantity control is required to control post-development peak release rates to match pre-development rates.

4.3.2 Water Quality

Enhanced level stormwater quality treatment (80% TSS Removal) is to be provided.

4.3.3 Erosion and Sediment Control

Erosion and sediment control BMPs shall be designed, constructed, and maintained in accordance with the *Erosion and Sediment Control Guide for Urban Construction (Toronto and Region Conservation Authority, 2019).*

4.4 Proposed Storm Service Connection

The proposed storm service connection for the Site will connect to the existing 300 mm diameter municipal storm sewer located to the east of the Site in the municipal parking lot / laneway, that ultimately drains to Balsam Lane. The storm service will consist of a 300 mm diameter storm sewer at a 0.84% slope. Refer Drawings S1 for further details.

4.4.1 Storm Sewer Capacity – Elm Street Connection Option

A connection to the existing 600 mm storm sewer in Elm Street was also investigated to determine if a connection was feasible. In order to make a connection to the existing storm sewer in Elm Street, a storm sewer service connection would need to cross above the existing sanitary sewer on Elm Street. Based on the elevation required to cross above the existing sanitary sewer, all of the Site's storm drainage system would need to be pumped.

Based on the anticipated long-term maintenance with pumping storm flows, it is proposed to utilize the existing outlet from the Site to the existing 300 mm storm sewer connection on Balsam Lane.

4.4.2 Storm Sewer Capacity – Balsam Lane Connection

An analysis of the existing and proposed storm sewer capacities for the existing storm sewer network on Balsam Lane was completed to identify the potential impacts resulting from the continued use of the existing storm sewer outlet under post-development conditions. Table 2 provides a summary of the analysis, the drainage area figures, and design sheets can be found in Appendix C.

Table 2: Balsam Lane Sewer Capacity Review

Scenario	Controlled Flow from Site (m^3/s)	Total Flow to Pipe (Pipe: 1196-2409)* m^3/s	% Full (Pipe: 1196-2409)*	Total Flow to Pipe (Pipe: 1198-2410)* m^3/s	% Full (Pipe: 1198-2410)**
Existing Condition (2-Year Storm Event)	-	0.145	83%	0.195	111%
Proposed Condition (2-Year Storm Event with 2-year Controlled Flow from Site)****	0.028	0.110	63%	0.162	92%
Proposed Condition (2-Year Storm Event with 100-year Controlled Flow from Site)****	0.053	0.135	77%	0.187	107%

*Pipe 1196-2409 is the first storm sewer in Balsam Lane downstream of the existing storm connection from the Site.
**Pipe 1198-2410 is the last storm sewer in Balsam Lane prior to the sewer network connecting out to Elm Street.
***The full flow pipe capacity for both of the existing storm sewer runs indicated in the table above is 0.175 m^3/s.
****All Proposed flows include the estimated 1 L/s of long-term groundwater discharge to be sent to the Balsam Lane storm sewers.

As shown in the table above, it was determined that in a 2-year event, the proposed development improved the capacity in the system by approximately 20%. In the 100-year event, it is proposed that the Site be controlled to flows less than the 2-year existing flow, which improves the capacity of the sewers from existing conditions.

Based on the results, it can be concluded that the proposed development reduces the runoff to the existing Balsam Lane storm sewers and improves the overall capacity within the storm sewer system when compared against existing conditions. The existing storm sewer outlet to Balsam Lane is capable of adequately conveying flows from the proposed development with no anticipated negative impact to the existing downstream storm sewer network.

4.5 Proposed Stormwater Quantity Control

The proposed site has been broken down into multiple drainage areas which are identified on Figure 3 and described in Table 3 in this report.

4.5.1 Method of Analysis

The Modified Rational Method has been used to calculate the runoff flow rates from all drainage catchments and to quantify the detention storage required for the stormwater quantity control measures. Refer to Appendix D for detailed stormwater management calculations.

4.5.2 Allowable Release Rate

Using the Town of Grimsby IDF parameters, the allowable release rate from the Site to Balsam Lane has been established as 60.1 L/s (See Table 1 within this report for breakdown). This is equal to the runoff flow rate generated during the 2-year design storm event, under pre-development conditions for the Drainage Areas 101 and 102 which discharge to Balsam Lane. See Appendix D for existing flow rate calculations. Proposed uncontrolled drainage to Mountain Street and Elm Street will be equal to or less than the existing flow rates to the rights-of-way for the 2 to 100-year design storm events.

4.5.3 Groundwater Discharge to Storm Sewer

A Hydrogeological Review Report for the Site was completed by DS Consultants Ltd. dated January 9, 2026, to assess the groundwater conditions and dewatering requirements of the development and to determine options for the disposal of pumped groundwater. Refer to Appendix F for the report.

According to the hydrogeological investigation, the groundwater quality is within the acceptable limits per the Regional Municipality of Niagara By-law No. 2024-51; therefore, short-term and long-term groundwater discharge can be pumped to the storm sewer. A conservative estimation of 67,000 L/day of short-term construction groundwater discharge and 18,000 L/day of long-term groundwater discharge was determined.

Assuming a pumping rate of 5 hours / day, the long-term groundwater discharge can be estimated as an additional 1 L/s to be sent to the storm sewer network.

4.5.4 Proposed Stormwater Management Control

Stormwater attenuation of the post-development runoff to the allowable release rate for the subject site will be achieved through a below grade stormwater tank. The majority of the subject site area will drain to a proposed underground stormwater tank / chamber

located in the underground level of the proposed building (northeast corner of the Site). Runoff will be captured in area drains and trench drains at grade and directed to the underground stormwater tank that will be equipped with a 150 mm diameter orifice pipe to control flows to below the allowable release rate during the 100-year design storm event to Balsam Lane. Based on the modified rational method, this equates to a required storage volume during the 100-year design storm event of 71 m^3. Refer to the Servicing Drawing S1 for details of the storm servicing. Complete stormwater management calculations are presented in Appendix D of this report. Table 3 outlines the post-development drainage areas and their associated post development flow rates.

Table 3: Proposed Storm Drainage

	Catchment	Area (m^2)	C	Q (2-Year)	Q (100-Year)
Controlled To Balsam from Stormwater Management (SWM) Tank (majority of Site including roof and patio areas)	201	4,019	0.9	26.3 L/s	50.92 L/s
Uncontrolled Sheetflow to Balsam	204	44	0.9	0.74 L/s	1.55 L/s
Long-term Groundwater Discharge	-	-	-	1.0 L/s	1.0 L/s
Total to Balsam Lane		**4,063**		**28.1 L/s**	**53.47 L/s**
Uncontrolled Sheetflow Drainage to Elm Street	202	287	0.9	4.84 L/s	10.13 L/s
Uncontrolled Sheetflow Drainage to Mountain Street	203	360	0.9	6.07 L/s	12.71 L/s
Total to Mountain and Elm		**648**		**10.92 L/s**	**22.85 L/s**
Total from Site		**4,710**		**39.02 L/s**	**76.32 L/s**

As shown in the table above, the 100-year design storm event post development flow rates from the Site have been controlled to less than the 2-year existing release rate to the Balsam Lane existing storm sewer system. Based on the existing conditions on-site, it is estimated that flows significantly larger than the 2-year design storm event overland flow towards Balsam Lane and make it into the storm sewer network within the ROW. However, in order to ensure the flows to the downstream storm sewer on Balsam Lane are reduced in the post-development condition, discharge from the Site has been over-controlled to attenuate flows to less than the 2-year pre-development flow rate.

4.5.5 Major Overland Flood Flow Route

The majority of the Site is covered with rooftop; however, for the sloped driveway entrance, a suitable major storm overland flow route does not exist. Area drains are

proposed in this area to capture flows up to the 100-year design storm event for the site area not covered by roof. All emergency overland flows the areas fronting Mountain Street and Elm Street is provided by directing flows to the right-of-way.

4.6 Proposed Stormwater Quality

The majority of the site coverage includes roof and pedestrian accessible areas that incorporate landscape features. These areas are unlikely to accumulate sediment; therefore, can be considered 'clean' water and achieve a TSS removal of 80%, not requiring any additional quality control. Enhanced level stormwater quality treatment (80% TSS Removal) has been provided for the majority of the Site (Area 201). This area will see some vehicle traffic and as such, will be captured and treated using an OGS unit to achieve an average of 80% long-term total suspended solids removal based on the annual loading basis from all runoff leaving the catchment area. It is proposed that the OGS unit be located at the storm outlet of the Stormwater Tank. Refer to Servicing Drawing S1 for the location of the OGS unit.

An OGS unit has been sized to treat the post-development flows rates from Area 201. A Stormceptor EF04 has been specified to provide achieve the required quality control treatment (80% TSS removal). The sizing report can be found in Appendix D.

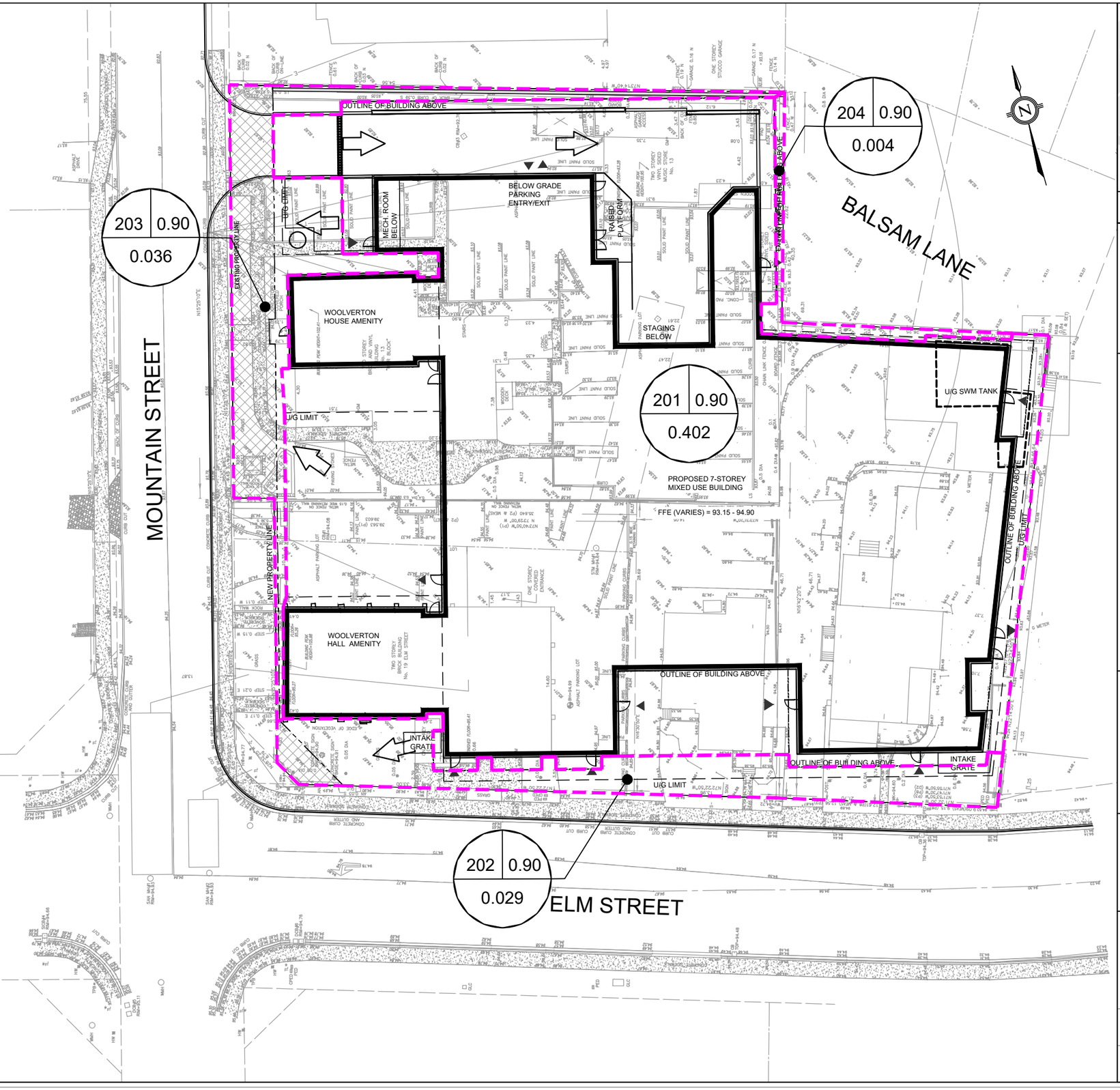
4.7 Erosion and Sediment Control

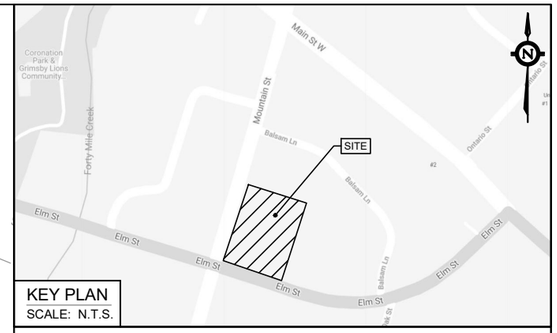
The Erosion and Sediment Control (ESC) strategy has been designed in conformance with the Stormwater Management Guidelines (December 2022) and will be subject to Region of Niagara and Town of Grimsby approval prior to issuance of Building Permit.

The following procedures shall be implemented to minimize the transportation of sediment onto the adjacent lands during construction:

- A silt fence shall be installed as shown on the Erosion and Sediment Control Plan and it shall be maintained in place while construction is being undertaken.
- A mud mat shall be installed at the site entrance during the construction phase to prevent sediment and debris from being tracked off-site. It shall be maintained throughout the duration of construction.
- Routine inspections, monitoring and repair of all erosion and control measures at a minimum once per week during the active construction period and after significant rainfall events (>100 mm) to ensure ESC measures remain in good working condition.
- Removal of temporary controls once the areas they serve are restored and stable.

Region of Niagara and The Town of Grimsby are to be provided with a copy of each inspection report in a timely manner following each inspection (i.e., within one week). Deficiencies in the ESC controls will be documented and will be addressed within a specified timeframe of initial identification. Refer to Drawing ESC1 Erosion and Sediment Control Plan for further details.





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LEGEND:

- EXISTING PROPERTY LINE
- PROPOSED PROPERTY LINE
- DRAINAGE BOUNDARY
- OVERLAND FLOW ROUTE
- DRAINAGE AREA NUMBER
- % IMPERVIOUS
- DRAINAGE AREA (ha)

SITE 0.90 / 1.14 ha

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POST DEVELOPMENT DRAINAGE PLAN

Drawn	Checked	Date	Drawing No.
GP	AK	21/04/21	FIG3
Scale		Project No.	
1:400		300053081	

File Name: 053081 - FIG3.dwg Date Plotted: March 16, 2026 - 9:27 AM

5.0 Sanitary Servicing

5.1 Existing Sanitary Sewer Infrastructure

Based on existing Town records and survey information, there is an existing 375 mm diameter sanitary sewer on the east side of Mountain Street and an existing 300 mm diameter sanitary sewer on the west side of Mountain Street. There is also an existing 250 mm diameter sanitary sewer on Elm Street across the frontage of the site. Refer to Drawing S1 for locations of the existing sanitary sewer infrastructure.

5.2 Proposed Sanitary Connection

The development will be serviced via a proposed 300 mm diameter sanitary sewer service connection at 1.5% slope. The connection will be made to the existing 375 mm diameter sanitary sewer located within Mountain Street with two proposed maintenance holes, one at the property line and another at the connection to the Existing sanitary sewer.

5.3 Sanitary Flows

The proposed sanitary flows generated by the development were calculated using the Niagara Region 2021 Water and Wastewater Master Servicing Plan (Volume 4) (GM BluePlan Engineering Limited, dated December 5, 2023), which specifies a residential and employment average flow rate of 255 L/cap/day and 310 L/cap/day, respectively. An infiltration rate of 0.4 L/s/ha for existing areas and 0.286 L/s/ha for new developments is also specified.

The existing Woolverton Hall which is to remain has a proposed non-residential space with an equivalent population of three. The proposed new Commercial Area for the Site is 277.6 m^2, with an equivalent population of six. The proposed development will have 150 residential units, with an equivalent population of 271 persons. Refer to the site statistics provided by the architect, included in Appendix A and Appendix E for the associated calculations. The total peak sanitary flow for the proposed development and existing buildings that will remain (including infiltration allowance) is 3.47 L/s.
Table 4 summarizes the sanitary flows.

Table 4: Proposed Sanitary Flows

Proposed Development	Units / Area	Population	Flows (L/s)
Existing Non-Residential Gross Floor Area (GFA) (Existing Woolverton Hall)	156.2 m^2	3	0.13
Proposed new “commercial” area	277.6 m^2	6	
Proposed Residential Gross Floor Area (GFA)	150 units	271	3.20
Infiltration Allowance	-	-	0.14
Total	-	**280**	3.47

6.0 Conclusions

In summary, the servicing approach for the development is provided below:

6.1 Water Servicing

- The calculated domestic water demand for the proposed development is 3.07 L/s for maximum hourly demand and 1.30 L/s for maximum daily demand.
- The calculated fire flow demand for the proposed development is 3,091 US GPM (195 L/s).
- The new water service connection includes both a 200 mm fire service connection, and a 150 mm domestic supply connection.
- Fire hydrant flow testing was completed, and it was determined that the existing municipal water supply network will not be impacted by the proposed development and that the existing municipal water supply network can adequately service the Site.

6.2 Stormwater Servicing

- Stormwater runoff from this Site will be controlled on-site to attenuate post-development condition flow rates to less than the existing condition flow rates for the Site.
- Post-development 100-year design storm flow rates from the Site to Balsam Lane have been overcontrolled to be less than or equal to the existing 2-year design storm event runoff rates to the existing storm sewer on Balsam Lane.
- Long-term groundwater discharge will be sent to the storm sewer system on Balsam Lane
- Water quantity control will be provided through a proposed below grade stormwater tank / chamber located within the building.
- Stormwater quality control will be achieved through the installation of an OGS (Stormceptor EF4) unit to treat the majority of the Site (Area 201).
- Sediment and erosion control measures to be taken during construction have been presented in this report.
- A CCTV investigation for the existing storm sewer system on Balsam Lane was completed to verify the alignment and condition of the existing 300 mm storm sewer connection.
- The new storm sewer service connection for the site will consist of a 300 mm diameter storm sewer at a 0.84% slope and connected to the existing 300 mm diameter storm sewer located within the existing municipal laneway / parking lot on Balsam Lane.

6.3 Sanitary Servicing

- The total peak sanitary sewer flow rate for the proposed development at 13 Mountain Street and 19 to 23 Elm Street (including the infiltration allowance) has been calculated as 3.47 L/s.
- The new sanitary sewer service connection consists of a 300 mm diameter sanitary sewer at a 1.5% slope and connected to the existing 375 mm sanitary sewer located on Mountain Street.

In summary, the Site can be sufficiently serviced with respect to water supply, storm sewer outlet, stormwater management and sanitary sewer outlet. Accordingly, we hereby recommend the adoption of this report as it relates to the provision of servicing works, and for the purposes of Official Plan and Zoning By-law Amendment application approvals.

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix A

Background Material

PROPOSED MULTI-UNIT RESIDENTIAL DEVELOPMENT

13 Mountain Street & 19-23 Elm Street, Grimsby, ON

01. SITE AREA	(m^2)
LOT AREA (existing)	4,710.0
LOT AREA (after road widening):	4,513.5
ROAD WIDENING AREA	196.5
MAXIMUM BUILDING FOOTPRINT (Including heritage)	2,777.3
LOT COVERAGE %	62%
HERITAGE BUILDING (6% OF SITE AREA)	273.7
-EXISTING WOOLVERTON HOUSE COVERAGE	117.5
-EXISTINGWOOLVERTON HALL COVERAGE	156.2

02. FLOOR AREA SUMMARY	(m^2)
TOTAL GCA (including Parking below grade)	21,014.8
TOTAL GCA (excluding Parking below grade)	14,878.2
NEW RESIDENTIAL GFA	11,033.2
NEW NON-RESIDENTIAL GFA (At Grade Commercial)	279.1
TOTAL GFA	11,312.3
NUMBER OF STORIES	7

03. F.S.I	PROPOSED
FSI IS CALCULATED BASED ON THE TOTAL GROSS FLOOR AREA AS A PERCENTAGE OF THE LOT AREA (After road widening)	**2.51**

04. RESIDENTIAL UNITS	PROPOSED
TOTAL	**150**

05. CAR PARKING	PROPOSED
STANDARD PARKING	143
SMALL CAR PARKING	5
ACCESSIBLE PARKING	6
TOTAL	**154**

06. BIKE PARKING	PROPOSED
RESIDENTIAL	46
RETAIL	2
TOTAL	**48**

07. ESTABLISHED GRADE	PROPOSED
AS PER BY-LAW	**94.45 m**

08. BUILDING HEIGHT	PROPOSED
BUILDING HEIGHT	**26.70 m**
BUILDING HEIGHT *(including mech)*	**31.00 m**

BUILDING HEIGHT DETERMINED AS FOLLOWS:

Height measured from average finished grade of the front wall of the building along Mountain Street and Elm street to the top 7th floor parapet.

GROSS FLOOR AREA (Grimsby Zoning By-law No. 14-45,2019)

GFA calculation based on definition per grimsby zoning by-law No. 14-45, 2019. Residential GFA includes only interior residential unit area, measured between the exterior faces of exterior walls or from the centre line of a common or party wall, excluding any cellar, basement, parking lot or mechanical room. GFA excludes amenity spaces, corridors and vertical and horizontal circulation, above and below grade parking and all other common areas.

AREA STATISTICS

LEVEL	TOTAL GCA		RESIDENTIAL AREA		COMMERCIAL/ RETAIL		LOCKERS		VEHICLE PARKING		INDOOR AMENITY		OUTDOOR AMENITY		GFA EXCLUSION		TOTAL GFA	
	m^2	sf	m^2	sf	m^2	sf	m^2	sf	m^2	sf	m^2	sf	m^2	sf	m^2	sf	m^2	sf
P1	3,192.5	34,363.8	0.0	0.0	0.0	0.0	0.0	0.0	2,729.6	29,381.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GROUND FLOOR	2,720.6	29,284.6	0.0	0.0	279.1	3,004.4	0.0	0.0	1,454.2	15,653.1	373.7	4,022.9	0.0	0.0	2,441.5	26,280.2	279.1	3,004.4
INTERMIDIATE FLOOR	1,591.0	17,125.3	0.0	0.0	0.0	0.0	0.0	0.0	1,489.9	16,037.6	0.0	0.0	190.0	2,045.1	1,591.0	17,125.3	0.0	0.0
FLOOR 2	2,404.7	25,883.4	2,015.7	21,696.9	0.0	0.0	113.6	1,222.3	0.0	0.0	0.0	0.0	0.0	0.0	388.9	4,186.5	2,015.7	21,696.9
FLOOR 3	2,404.5	25,881.9	2,115.0	22,765.2	0.0	0.0	37.5	403.8	0.0	0.0	0.0	0.0	0.0	0.0	289.6	3,116.7	2,115.0	22,765.2
FLOOR 4	2,016.9	21,709.5	1,725.6	18,574.5	0.0	0.0	37.5	403.8	0.0	0.0	0.0	0.0	0.0	0.0	291.3	3,135.0	1,725.6	18,574.5
FLOOR 5	2,016.9	21,709.5	1,725.6	18,574.5	0.0	0.0	37.5	403.8	0.0	0.0	0.0	0.0	0.0	0.0	291.3	3,135.0	1,725.6	18,574.5
FLOOR 6	2,016.9	21,709.5	1,725.6	18,574.5	0.0	0.0	37.5	403.8	0.0	0.0	0.0	0.0	0.0	0.0	291.3	3,135.0	1,725.6	18,574.5
FLOOR 7	2,016.9	21,709.5	1,725.6	18,574.5	0.0	0.0	37.5	403.8	0.0	0.0	0.0	0.0	0.0	0.0	291.3	3,135.0	1,725.6	18,574.5
MPH	634.0	6,824.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	634.0	6,824.5	0.0	0.0
TOTAL	**21,014.8**	**219,377.1**	**11,033.2**	**118,760.3**	**279.1**	**3,004.4**	**301.1**	**3,241.1**	**5,673.8**	**61,071.8**	**373.7**	**4,022.9**	**190.0**	**2,045.1**	**6,510.0**	**63,248.6**	**11,312.3**	**121,764.7**
ABOVE GROUND GCA EXCLUDING PARKING	**14,878.2**	**160,147.2**																

VEHICULAR PARKING

REQUIRED VEHICULAR PARKING - Site Specific ZBL (OLT-24-001)			
USE	**UNITS/GFA**	**MINIMUM PARKING RATE**	**MINIMUM REQUIRED**
RESIDENTIAL DWEILLING UNIT	150 units	1.00	150
RESIDENTIAL SUB-TOTAL			150
NON-RESIDENTIAL			
-RESIDENTIAL VISITOR	150 units	0.25	38
-RETAIL USE	279 sqm	1/28sqm	10
NON-RESIDENTIAL SUB-TOTAL			48
TOTAL PARKING REQUIREMENT			198

ACCESSIBLE PARKING REQUIREMENT	2 SPACES + 2% of supply	6

Note: Vehcular parking calculations resulting in a fraction have been rounded up to the nearest whole number in accordance with the requirements oulined in Section 5.2 of the Town of Grimsby Zone By-law 14-45

PROPOSED VEHICULAR PARKING												
LEVEL	**COMMERCIAL/VISITOR PARKING**				**RESIDENTIAL PARKING**				**TOTAL PARKING SUPPY**			
	STANDARD	ACCESSIBLE	SMALL CAR	TOTAL	STANDARD	ACCESSIBLE	SMALL CAR	TOTAL	STANDARD	ACCESSIBLE	SMALL CAR	TOTAL
P1	5	2	0	7	64	0	1	65	69	2	1	72
GROUND	0	0	0	0	35	2	3	40	35	2	3	40
INTERMIDIATE	0	0	0	0	39	2	1	42	39	2	1	42
TOTAL	**5**	**2**	**0**	**7**	**138**	**4**	**5**	**147**	**143**	**6**	**5**	**154**
* Tandem parking spaces are not included in parking space calculations noted above. 6 Tandem parking spaces provided.												

BICYCLE PARKING

BICYCLE PARKING STATISTICS				
REQUIREMENT (BY-LAW No. 14-45)				SPACES PROPOSED
USE	**UNITS/SPACES**	**BIKE RATE**	**SPACES REQUIRED**	
RESIDENTIAL	150 units	0.3	45	46
RETAIL	10 spaces	7% of supply	1	2
TOTAL BICYCLE PARKING			**46**	**48**

LOADING AND WASTE

PROPOSED LOADING AND WASTE	
UNITS COUNT	150
LOADING SPACE REQUIREMENT	Loading Space (3.5 x 9.0 m)
STAGING AREA	17.8 m^2
WASTE STORAGE ROOM	65.64 m^2

Issued

Issued for ZBA2	Mar. 13, 2026
Issued for OPA/ZBA1	May 16, 2025
Description:	Date:

General Notes:

1. These Contract Documents are the property of the Architect. The Architect bears no responsibility for the interpretations of these documents by the Contractor. Upon written application the Architect will provide written/graphic clarification or supplementary information regarding the intent of the Contract Documents. The Architect will review Shop Drawings submitted by the Contractor for design conformance only.

2. Drawings are not to be scaled for construction. Contractor to verify all existing conditions and dimensions required to perform the Work and report any discrepancies with the Contract Documents to the Architect before commencing work.

3. Positions of exposed or finished mechanical or electrical devices, fittings, and fatures are indicated on the Architectural drawings. The locations shown on the Architectural drawings govern over the Mechanical and Electrical drawings. Those items not clearly located will be located as directed by the Architect.

4. Specifications must be read and interpreted with all the construction documents in combination. Drawings, schedules, and any other graphic representation supplement the written word. In the event of conflict between drawings and specifications, the specifications take precedence over the drawings.

Architects:

STUDIO JCI

20 De Boers Drive suite 525
Toronto ON M3H 0H1
t. 416.901.6528
www.studiojci.com

MULTI-UNIT RESIDENTIAL DEVELOPMENT

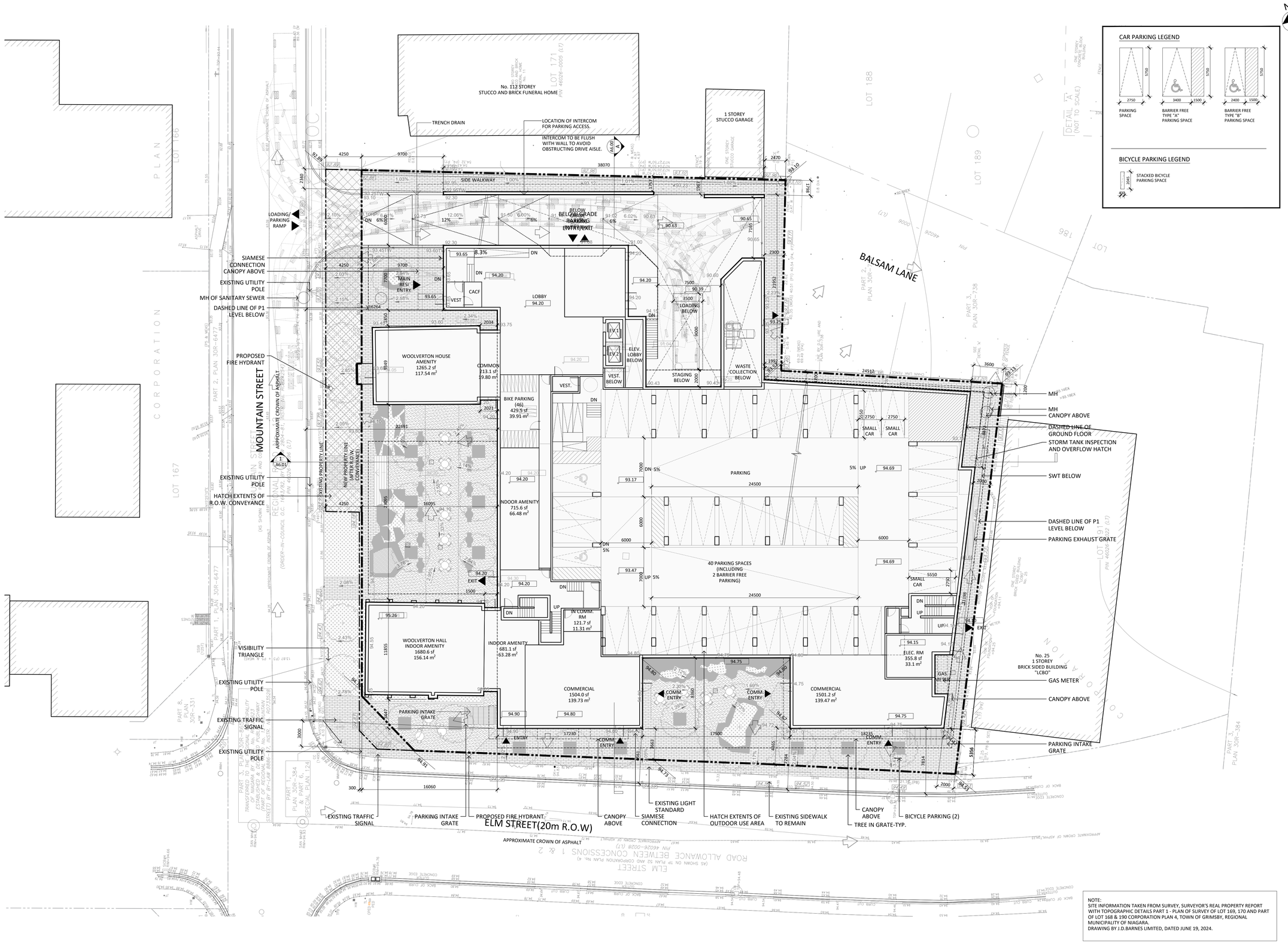
13 Mountain Street & 19 - 23 Elm Street
Grimsby, ON L3M 3J7

PROJECT STATISTICS

Project No.:	2416
Scale:	NTS
Date:	Mar. 13, 2026
Drawn by:	

Drawing No.:

A0.01



NOTE:
SITE INFORMATION TAKEN FROM SURVEY, SURVEYOR'S REAL PROPERTY REPORT WITH TOPOGRAPHIC DETAILS PART 1 - PLAN OF SURVEY OF LOT 169, 170 AND PART OF LOT 168 & 190 CORPORATION PLAN 4, TOWN OF GRIMSBY, REGIONAL MUNICIPALITY OF NIAGARA.
DRAWING BY J.D.BARNES LIMITED, DATED JUNE 19, 2024.

Issued

Issued for ZBA2	Mar. 13, 2026
Issued for OPA/ZBA1	May 16, 2025
Description:	Date:

General Notes:

1. These Contract Documents are the property of the Architect. The Architect bears no responsibility for the interpretations of these documents by the Contractor. Upon written application the Architect will provide written/graphic clarification or supplementary information regarding the intent of the Contract Documents. The Architect will review Shop Drawings submitted by the Contractor for design conformance only.

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Architects:

STUDIO JCI

20 De Boers Drive suite 525
Toronto ON M3H 0H1
t.416.901.6528
www.studiojci.com

MULTI-UNIT RESIDENTIAL DEVELOPMENT

13 Mountain Street & 19 - 23 Elm Street
Grimsby, ON L3M 3J7

GROUND FLOOR SITE PLAN

Project No.:	2416
Scale:	1:200
Date:	Mar. 13, 2026
Drawn by:	JCI

Drawing No.:

A1.01

Laura Galati

From: Jingshu Wang <jwang@studiojci.com>
Sent: Friday, March 13, 2026 7:09 PM
To: Sanjam Raisuada; Allison Chewter; Victoria Borsodi; Sudipto Sengupta; Audric Montuno; Celina Hevesi; Steven Pignataro; Stephanie A. Hardes; Harley Valentine; Michael Wong; Samantha Menard; Angela Kroetsch; Laura Galati; Brianna Brown
Subject: The Woolverton_Issued for ZBA2(Draft)

Importance: High

Hi All,

Please find the attached draft issued for the ZBA2 set for your coordination. Instead of the 2.5 m setback on the 7th floor, we are now proposing an additional 1.5 m setback at the northwest volume.

260313_ZBA2_Draft

Current unit mix is as shown below:

UNIT COUNT

FLOORS	Studio	1b	2b	3b	Total
	#	#	#	#	0
GF	0	0	0	0	0
INT	0	0	0	0	0
2	2	8	13	4	27
3	1	9	17	2	29
4	4	1	18	1	24
5	4	1	18	1	24
6	2	1	20	0	23
7	2	1	20	0	23
MPH	0	0	0	0	0
Total	**15**	**21**	**106**	**8**	**150**
%	**10%**	**14%**	**71%**	**5%**	**100%**

@Sanjam, we have placed today's date on the drawings as a placeholder. Please let us know what date should be shown on the drawings for the final submission set.
@Steven, please note that the client may reduce one parking space. This will be further discussed next Monday, and we will keep you informed.

Thank you,

Jingshu Wang

M.Arch.,OAA
Project Manager

T. 416 901 6528 x 105
E. jwang@studiojci.com

STUDIO JCI

BURNSIDE

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Appendix B

Water Calculations

BURNSIDE

CALCULATION SHEET

Project:	**13 Mountain St & 19 Elm St**	Prepared by:	L.Galati
	Grimsby, Ontario	Checked by:	A.Kroetsch
		Project No:	300053081
	Water Demand & Fire Demand	Date:	March 8, 2026

I. Fire Flow Calculation

*Based on Fire Underwriters Survey

1 $F = 220\ C\ (A)^{1/2}$

Where F= Fire flow in Lpm

C= construction type coefficient

= 0.8 For Non-combustible construction

A = total floor area in sq.m. excluding basements

*Minimum fire resistance rating for all structural elements and walls is 1hr

Floor	Area (sq.m)	%
Ground	2722	100%
Floor 2	2558	25%
Floor 3	2423	25%

*Largest floor area + 25% of each of the 2 immediately adjoining floors with all vertical openings and exterior communications properly protected

Largest Area = 3,967 sq.m.

F = 11,085.14 L/min

Round to nearest 1000 l/min

F = 11,000 L/min

2 Occupancy Reduction

15% reduction for non-combustible occupancy, residential

Reduction = 1650

F = 9,000 L/min *Round to nearest 1000 L/min

3 Sprinkler Reduction

30% Reduction for NFPA Sprinkler System

Reduction = 2700 l/min

F = 6,300

4 Separation Charge

20%	N	3.1 - 10m	
20%	E	3.1 - 10m	
10%	S	20.1 - 30m	
10%	W	20.1 - 30m	
60%	Total Separation Charge,		5400 L/min

F= 11,700 L/min

195 L/s

3,091 US GPM

Fire Flow Required = 195.00 L/s 3091 US GPM

BURNSIDE

CALCULATION SHEET

Project:	**13 Mountain St & 19 Elm St**	Prepared by:	L.Galati
	Grimsby, Ontario	Checked by:	A.Kroetsch
		Project No:	300053081
	Water Demand & Fire Demand	Date:	March 8, 2026

II. Domestic Flow Calculations

Commercial	Population =	9		*From Sanitary Calculations (Niagara Region Water & Wastewater Master Servicing Plan (2021) Volume 3)
	Avg. Day Demand =	270	L/cap/day	
		0.03	L/s	
	Max. Daily Peaking Factor =	1.66		
	Max. Hourly Peaking Factor =	2.00		
Residential	Population (Residential) =	271	persons*	*From Sanitary Calculations (Niagara Region Water & Wastewater Master Servicing Plan (2021) Volume 3)
	Avg. Day Demand (Residential) =	240	L/cap/day	
		0.75	L/s	
	Max. Daily Peaking Factor =	1.66		
	Max. Hourly Peaking Factor =	4.0		
	Max. Day Domestic Flow Rate F_{dom} =	1.30	L/s	
		21	US GPM	
	Max. Hourly Domestic Flow Rate F_{dom} =	3.07	L/s	
		49	US GPM	

III. Flow Test Results

* As per fire flow test completed between fire hydrants located at 10 Mountain Street and 19 Elm Street, Grimsby @ 8am on March 31st, 2025

Static Pressure= 89 psi

Pressure (psi)	*Flow (L/s)*	*Flow (GPM)*
87	47.7	756
83	65.6	1040
77	95.1	1508

Anticipated Residual Pressures at Fire Flow

Scenario	Flow (L/s)	Pressure (psi)	
		Estimated	Required*
Fire+Max Day	196.3	***31.1***	30

*As per Niagara Region Water Wastewater Project Design Manual (July 2023)

Troy
Life & Fire Safety Ltd.

FLOW TEST REPORT

LOCATION: 19 Elm Street, Grimsby, ON

DATE OF FLOW TEST: March 31, 2025 TIME OF FLOW TEST: 8:00 AM

TEST BY: TROY LIFE & FIRE SAFETY TEST CONDUCTED BY: Dylan Lee

WITNESSED BY: Town of Grimsby

FLOW NOZZLE TYPE (IE HOSE MONSTER/PLAY PIPE): Hose Monster

WATER MAIN SIZE (IF AVAILABLE): 10", 8", 6"

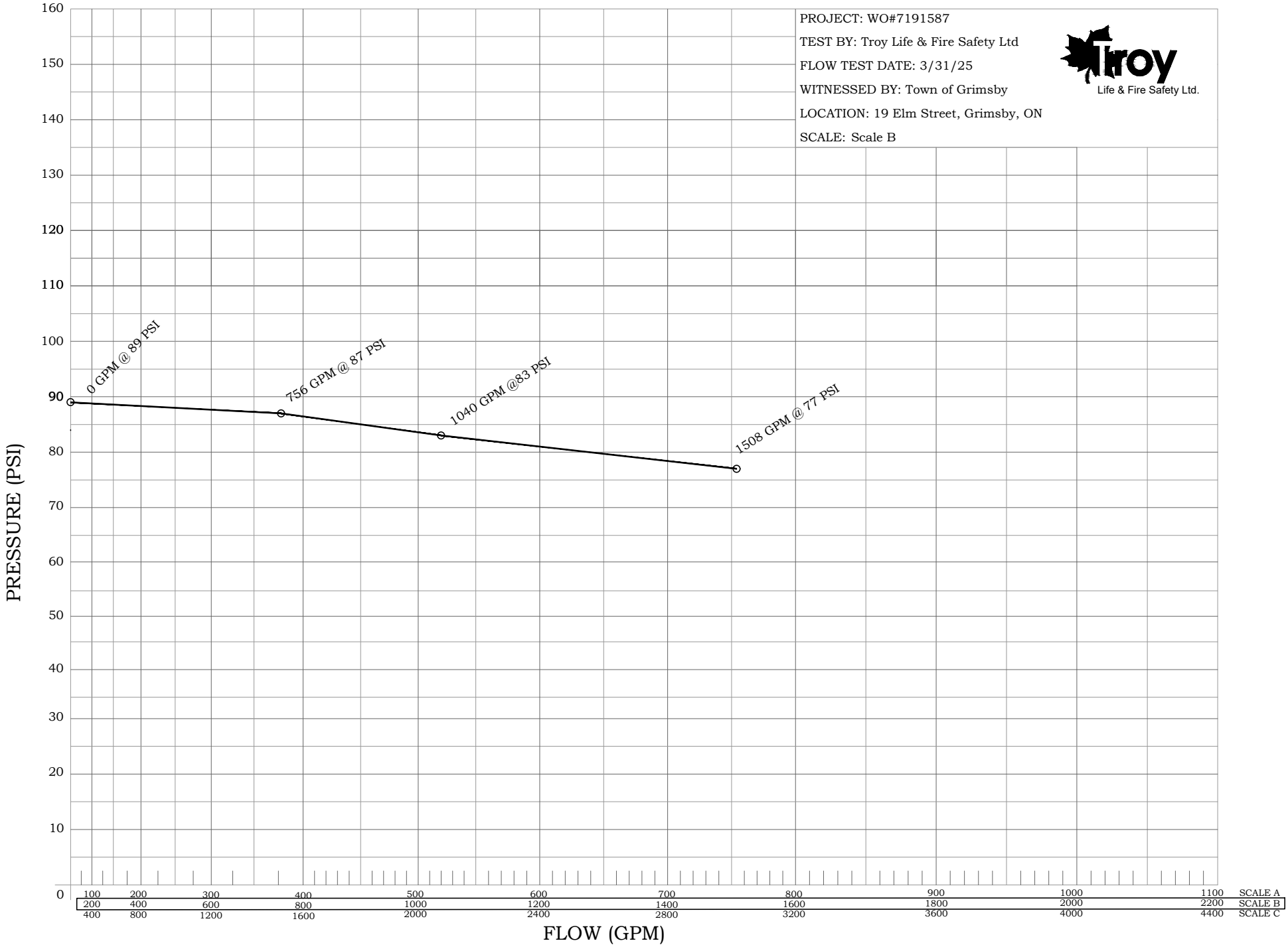
HYDRANT ELEVATION COMPARED TO BUILDING: No Elevation Change

HYDRANT FLOW DATA:

STATIC PRESSURE:	89 PSI		
SIZE OF OPENING:	1x1¾"	1x2½"	2x2½"
DISCHARGE COEFFICIENT:	N/A	N/A	N/A
PITO READING:	72 PSI	38 PSI	20+20 PSI
FLOW USGPM:	756	1040	1508
RESIDUAL PRESSURE:	87 PSI	83 PSI	77 PSI

DRAWING OF SITE

WATER SUPPLY GRAPH



BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix C

Balsam Storm Sewer Calculations

GraniteNet
ASSET INSPECTION / DECISION SUPPORT SOFTWARE

CUES, Inc.
3600 Rio Vista Avenue
Orlando, FL 32805
Phone: 407-849-0190
Fax: 407-425-1569

PACP Inspections

Surveyed by:	Certificate number:	Owner:	Customer:	Drainage area:	P/O number:	Sheet number:
Steven	U-515-6023882		Aquaflow			

Pipe segment ref.:	Start date/time:	Street:	City:
CB-2_CB-1	20211006 14:49	13 MOUNTAIN STREET - STORM	GRIMSBY

Location details:	Upstream MH No:	Rim to invert:	Grade to invert:	Rim to grade:
	CB-2			

Sewer use:	Direction:	Flow control:	Downstream MH No:	Rim to invert:	Grade to invert:	Rim to grade:
SW	D		CB-1			

Height:	Width:	Shape:	Material:	Lining method:	Pipe joint length:	Total length:	Length surveyed:	Year laid:	Year renewed:
300 mm		C	RCP		2.5 m	60.0 m	54.6 m		

Media label:	Purpose:	Sewer category:	Pre-cleaning:	Date cleaned:	Work order no.:	Weather:	Location code:	Pressure value:
			J			1		

Project name:	Additional info:
21300-ONSITE	

Observations

Distance	Video Ref.	PACP Code	Continuous	S/M/L	Value Inches (mm) 1st	Value Inches (mm) 2nd	%	Joint	Circumferential Location At/From	Circumferential Location To	Image Ref.	Remarks
0.0 m	00:00:12	AMH						☐	/			CB-2
0.0 m	00:00:22	MWL					0	☐	/			
5.5 m	00:01:27	B						☐	6 / 10			
19.3 m	00:02:56	DAE					15	☐	4 / 8			
27.7 m	00:04:08	MWL					10	☐	/			
30.1 m	00:04:25	MWL					0	☐	/			
48.8 m	00:05:57	FL						☐	6 /			
54.6 m	00:06:43	MGO						☐	/			CB COVER IS SIEZED SHUT - NO ACCESS

Observations

Distance	Video Ref.	PACP Code	Continuous	S/M/L	Value Inches (mm) 1st	2nd	%	Joint	Circumferential Location At/From	To	Image Ref.	Remarks
54.6 m	**00:06:59**	**AMH**						☐	**/**			**CB-1**

SUBSURFACE UTILITY PLAN OF
ELM STREET & MOUNTAIN STREET
TOWN OF GRIMSBY
REGIONAL MUNICIPALITY OF NIAGARA

SCALE 1 : 150
2 0 2 4 6 8 metres

METRIC

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

COORDINATE SYSTEM

UTM ZONE 17, NAD83 (CSRS) (2010.0).

LEGEND

— SAN —	DENOTES UNDERGROUND SANITARY SEWER
— STM —	DENOTES UNDERGROUND STORM SEWER
— G —	DENOTES UNDERGROUND GAS LINE
— W —	DENOTES UNDERGROUND WATER LINE
— UE —	DENOTES UNDERGROUND HYDRO LINE
— UC —	DENOTES UNDERGROUND CABLE LINE
— UT —	DENOTES UNDERGROUND TELEPHONE LINE
— FO —	DENOTES UNDERGROUND FIBRE OPTIC LINE
SAN MH	DENOTES SANITARY MANHOLE
STM MH	DENOTES STORM MANHOLE
CB	DENOTES CATCH BASIN
DCB	DENOTES DOUBLE CATCH BASIN
GM	DENOTES GAS METER
WMH	DENOTES WATER MANHOLE
PED	DENOTES PEDESTAL
CPED	DENOTES TELEVISION PEDESTAL
GLC	DENOTES GROUND LEVEL CHAMBER
HW	DENOTES HANDWELL
TL	DENOTES TRAFFIC LIGHT
TPB	DENOTES TRAFFIC POLE BUTTON
CAP	DENOTES CAP

SEWER INVERT NOTE:

SEWER INVERT DEPTHS ARE MANUALLY MEASURED FROM THE LID/GRATE OF THE GIVEN FEATURE.

ANNOTATIONS DISPLAYED AS *ITALICIZED* WITH AN ASTERISK* HAVE BEEN INTERPOLATED FROM RECORDS AND WERE NOT FIELD VERIFIED BY ONSITE LOCATES LTD.

INVERT DEPTH MEASUREMENTS ARE FROM THE ASSUMED BOTTOM OF THE FACILITY STRUCTURE.

DEPTHS ARE NOT SUITABLE FOR EXCAVATION PURPOSES. SEWER NETWORK CONNECTIONS WERE COMPILED WHERE FIELD EVIDENCE COINCIDED WITH AS-BUILT RECORDS

WHERE NO DEPTH INFORMATION COULD BE OBTAINED, UTILITIES ARE ASSUMED TO BE AT STANDARD INSTALLATION DEPTH FOR THE SPECIFIC TYPE OF UTILITY.

THE MOST RELIABLE WAY TO PRECISELY DETERMINE THE HORIZONTAL AND VERTICAL LOCATION OF AN UNDERGROUND UTILITY IS THROUGH PHYSICAL EXPOSURE USING SAFE DIGGING TECHNIQUES (COMMONLY PERFORMED WITH HYDRO VACUUM EXCAVATION)

INVERT DEPTH MEASUREMENTS HEREON ARE PROVIDED IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

UNDERGROUND UTILITY NOTES

THE UTILITY DATA DEPICTED ON THIS DRAWING WERE ACQUIRED IN ACCORDANCE WITH ASCE STANDARD 38-02. THE INFORMATION IS SHOWN BY ATTRIBUTED QUALITY LEVELS WHICH ARE DEFINED AS FOLLOWS:

DATA QUALITY LEVEL

HIGHEST QUALITY
QUALITY LEVEL A
QUALITY LEVEL B
QUALITY LEVEL C
QUALITY LEVEL D
LOWEST QUALITY

QUALITY LEVEL "A" - INFORMATION OBTAINED BY ACTUAL PHYSICAL EXPOSURE OF TARGETED UTILITIES AND SUBSEQUENT MEASUREMENT OF THE EXPOSED PRECISE HORIZONTAL AND VERTICAL POSITION.

QUALITY LEVEL "B" - INFORMATION OBTAINED USING GEOPHYSICAL LOCATE TECHNIQUES TO IDENTIFY THE EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF THE DESIGNATED UTILITIES.

QUALITY LEVEL "C" - INFORMATION OBTAINED BY SURVEYING AND PLOTTING VISIBLE UTILITY FEATURES AND BY USING PROFESSIONAL JUDGMENT IN CORRELATING THIS INFORMATION TO THE QUALITY "D" INFORMATION OBTAINED.

QUALITY LEVEL "D" - INFORMATION DERIVED FROM UTILITY RECORDS OR VERBAL RECOLLECTIONS

ALL SERVICES ARE QUALITY "D" UNLESS NOTED OTHERWISE.
LEVEL "D" RECORD INFORMATION SHOWN ON THIS PLAN HAVE BEEN PLOTTED APPROXIMATELY AS PER THE RECORDS FOUND AND COULD NOT BE FIELD VERIFIED WITHIN THE SCOPE OF THIS PROJECT. IF FURTHER VERIFICATION IS REQUIRED, IT IS SUGGESTED THAT LEVEL "A" METHODOLOGIES BE EMPLOYED.

LOST SIGNAL- DENOTES/INDICATES A POINT WHERE QL-B METHODS COULD NO LONGER ASCERTAIN THE HORIZONTAL POSITION OF A FACILITY.

QUALITY LEVEL "D" INFORMATION COMPILED FROM RECORDS PROVIDED BY BELL CANADA MUNICIPAL OPERATIONS CENTRE MARKUP# 89820, ENBRIDGE FILE# 25231137, TOWN OF GRIMSBY DRAWING# ST-Y12-40H/ 13 MOUNTAIN MAP.PDF/ 19 ELM MAP.PDF/ DWG. NO. WTM 82 -01 AND 7130-1, GRIMSBY POWER SCHEMATICS1.PNG.

CAUTION: CALL BEFORE YOU DIG

THIS PLAN IS INTENDED FOR DESIGN PURPOSES ONLY. OTHER BURIED UTILITIES MAY EXIST WHICH ARE NOT SHOWN DUE TO INSUFFICIENT INFORMATION OR IMPROPER INSTALLATION. CONTACT ALL POTENTIAL OWNERS OF UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION OR BREAKING GROUND.
IT IS THE RESPONSIBILITY OF THE CONTRACTOR/BUILDER TO ENSURE THE APPROPRIATE LEGAL REQUIREMENTS ARE MET.

SUBSURFACE UTILITY FIELD WORK WAS COMPLETED ON THE 8TH DAY OF OCTOBER, 2021

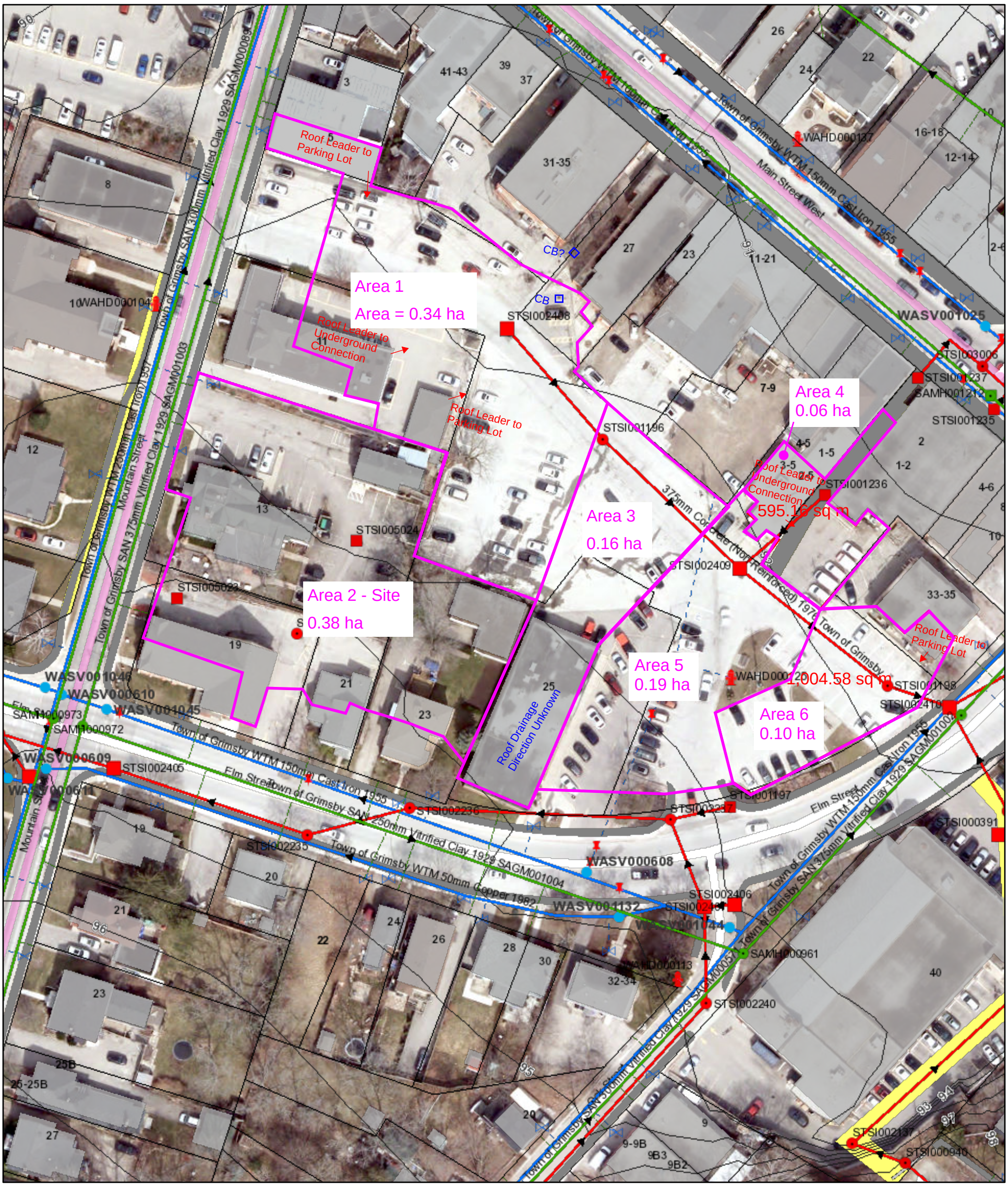
ONSITE LOCATES INC.
UTILITY LOCATE SERVICES
A wholly owned subsidiary of J.D. Barnes Ltd.
140 RENFREW DRIVE, SUITE 100, MARKHAM, ON L3R 6B3
T: 1-800-805-6155 www.onsitelocates.ca

DRAWN BY:	CHECKED BY:	REFERENCE NO.:
ZK	MC	21-46-31781

FILE: \\USER8\usrl\ONSITE\21-46-31781-cctv-13\To Client\Oct21\2021-46-31678-Rev03-Oct21.dgn DATED:

PLOTTED: 10/21/2021

Grimsby Interactive Mapping System



2021-04-23, 3:18:10 p.m.

1:1,128

0 50 100 200 ft

60.00 m

0 15 30 60 m

Site Address Owner Info

Assessment Parcel_OwnerInfo

wMain
- ACTIVE
- UNDER CONSTRUCTION

wLateralLine
- ACTIVE
- UNDER CONSTRUCTION
- Water Leaks

wSystemValve
- ACTIVE, <Null>
- ACTIVE, Ball
- ACTIVE, Butterfly
- ACTIVE, Check
- ACTIVE, Gate
- UNDER CONSTRUCTION, <Null>
- UNDER CONSTRUCTION, Gate

wFitting
- <Null>, ACTIVE
- Cap, ACTIVE
- Cross, ABANDONED
- Cross, ACTIVE
- Material Change, ABANDONED
- Reducer, ACTIVE
- Reducer, UNDER CONSTRUCTION
- Tap, ACTIVE
- Tee, ACTIVE
- Tee, UNDER CONSTRUCTION
- Wye, ACTIVE

wHydrant
- ACTIVE
- UNDER CONSTRUCTION
- wSamplingStation

swGravityMain
- ABANDONED
- ACTIVE
- REMOVED
- UNDER CONSTRUCTION

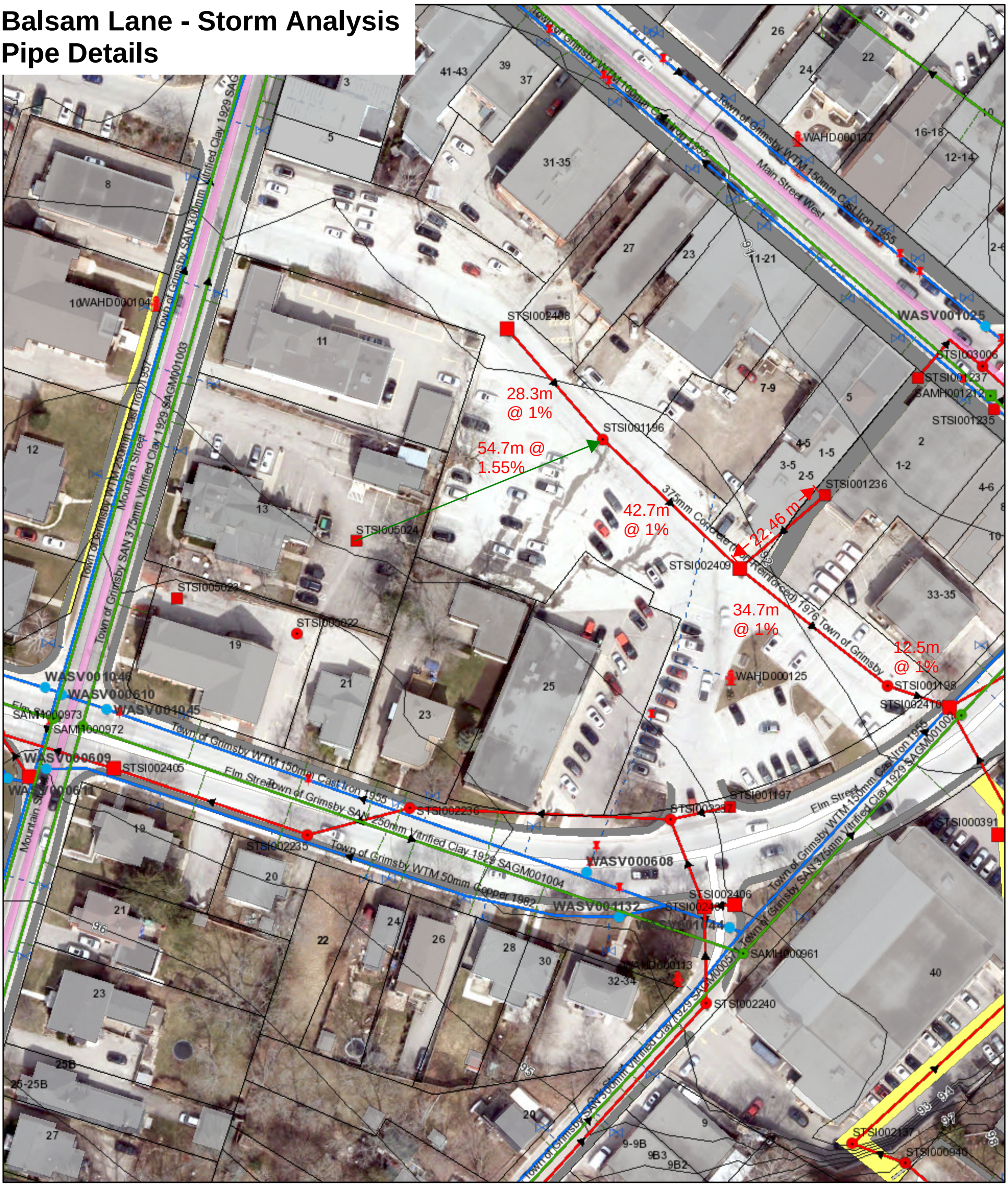
swCulvert
- <all other values>
- ACTIVE
- UNDER CONSTRUCTION
- swLaterals

swInlet
- CAP
- Catchbasin
- Catchbasin Manhole
- Ditch Inlet
- Ditch Inlet Catchbasin
- Ditch Inlet Manhole

Web AppBuilder for ArcGIS

Grimsby Interactive Mapping System

Balsam Lane - Storm Analysis
Pipe Details



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- ACTIVE, <Null>
- ACTIVE, Ball
- ACTIVE, Butterfly
- ACTIVE, Check
- ACTIVE, Gate
- UNDER CONSTRUCTION, <Null>
- UNDER CONSTRUCTION, Gate

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- Tap, ACTIVE
- Tee, ACTIVE
- Tee, UNDER CONSTRUCTION
- Wye, ACTIVE

wHydrant
- ACTIVE
- UNDER CONSTRUCTION
- wSamplingStation

swGravityMain
- ABANDONED
- ACTIVE
- REMOVED
- UNDER CONSTRUCTION

swCulvert
- <all other values>
- ACTIVE
- UNDER CONSTRUCTION
- swLaterals

swInlet
- CAP
- Catchbasin
- Catchbasin Manhole
- Ditch Inlet
- Ditch Inlet Catchbasin
- Ditch Inlet Manhole

STORM SEWER DESIGN SHEET: (2 Year Storm)

13 Mountain & 19 Elm Street

Project #: 300053081.0
Date: 12-May-25
Designed: L.Galati
Checked: A. Kroetsch

Min. Diameter = 250 mm
Mannings 'n'= 0.013
Starting Tc = 10 min
Factor of Safety = 10 %

Rainfall Intensity = $\frac{A}{(Tc+B)^c}$ *where Tc is in minutes*

A = 603.25
B = 6 *(2 Yr)*
C = 0.79

NOMINAL PIPE SIZE USED

DESCRIPTION	FROM MH	TO MH	AREA (ha)	RUNOFF COEFFICIENT "R"	'AR'	ACCUM. 'AR'	RAINFALL INTENSITY (mm/hr)	FLOW (m3/s)	CONSTANT FLOW (m3/s)	ACCUM. CONSTANT FLOW (m3/s)	TOTAL FLOW (m3/s)	LENGTH (m)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (m3/s)	FULL FLOW VELOCITY (m/s)	INITIAL Tc (min)	TIME OF CONCENTRATION (min)	ACC. TIME OF CONCENTRATION (min)	PERCENT FULL (%)
Area 1 - Balsam Lane	STSI002408	STSI001196	0.34	0.90	0.31	0.31	67.5	0.058			0.058	28.3	1.00	300	0.097	1.37	10.00	0.34	10.34	60%
Area 2 - Proposed Site	STSI00502A	STSI001196	0.38	0.90	0.34	0.34	67.5	0.064			0.064	54.7	1.55	300	0.120	1.70	10.00	0.54	10.54	53%
Area 3 - Balsam Lane	STSI001196	STSI002409	0.16	0.90	0.15	0.80	65.8	0.145			0.145	42.7	1.00	375	0.175	1.59	10.54	0.45	10.98	83%
Area 4 - Walkway*	STSI001236	STSI002409	0.06	0.90	0.05	0.05	67.5	0.010			0.010	22.5	1.00	250	0.059	1.21	10.00	0.31	10.31	17%
Area 5 - Balsam Lane	STSI002409	STSI001198	0.19	0.90	0.17	1.02	64.4	0.183			0.183	34.7	1.00	375	0.175	1.59	10.98	0.36	11.35	104%
Area 6 - Balsam Lane	STSI001198	STSI002410	0.10	0.90	0.09	1.11	63.3	0.195			0.195	12.5	1.00	375	0.175	1.59	11.35	0.13	11.48	111%

STORM SEWER DESIGN SHEET: (2 Year Storm)

13 Mountain & 19 Elm Street

Project #: 300053081.0
Date: 9-Mar-26
Designed: L.Galati
Checked: A. Kroetsch

Min. Diameter = 250 mm
Mannings 'n'= 0.013
Starting Tc = 10 min
Factor of Safety = 10 %

Rainfall Intensity = $\frac{A}{(Tc+B)^c}$ *where Tc is in minutes*

A = 603.25
B = 6 *(2 Yr)*
C = 0.79

NOMINAL PIPE SIZE USED

DESCRIPTION	FROM MH	TO MH	AREA (ha)	RUNOFF COEFFICIENT "R"	'AR'	ACCUM. 'AR'	RAINFALL INTENSITY (mm/hr)	FLOW (m3/s)	CONSTANT FLOW (m3/s)	ACCUM. CONSTANT FLOW (m3/s)	TOTAL FLOW (m3/s)	LENGTH (m)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (m3/s)	FULL FLOW VELOCITY (m/s)	INITIAL Tc (min)	TIME OF CONCENTRATION (min)	ACC. TIME OF CONCENTRATION (min)	PERCENT FULL (%)
Area 1 - Balsam Lane	STSI002408	STSI001196	0.34	0.90	0.31	0.31	67.5	0.058			0.058	28.3	1.00	300	0.097	1.37	10.00	0.34	10.34	60%
Area 2 - Proposed Site**	STSI00502A	STSI001196					67.5		0.028	0.028	0.028	54.7	0.80	300	0.086	1.22	10.00	0.75	10.75	32%
Area 3 - Balsam Lane	STSI001196	STSI002409	0.16	0.90	0.15	0.45	65.1	0.082		0.028	0.110	42.7	1.00	375	0.175	1.59	10.75	0.45	11.19	63%
Area 4 - Walkway*	STSI001236	STSI002409	0.06	0.90	0.05	0.05	67.5	0.010			0.010	22.5	1.00	250	0.059	1.21	10.00	0.31	10.31	17%
Area 5 - Balsam Lane	STSI002409	STSI001198	0.19	0.90	0.17	0.68	63.8	0.120		0.028	0.148	34.7	1.00	375	0.175	1.59	11.19	0.36	11.56	84%
Area 6 - Balsam Lane	STSI001198	STSI002410	0.10	0.90	0.09	0.77	62.7	0.134		0.028	0.162	12.5	1.00	375	0.175	1.59	11.56	0.13	11.69	92%

STORM SEWER DESIGN SHEET: (2 Year Storm)

13 Mountain & 19 Elm Street

BURNSIDE

Project #: 300053081.0
Date: 9-Mar-26
Designed: L.Galati
Checked: A. Kroetsch

Min. Diameter = 250 mm
Mannings 'n'= 0.013
Starting Tc = 10 min
Factor of Safety = 10 %

Rainfall Intensity = $\frac{A}{(Tc+B)^{c}}$ *where Tc is in minutes*

A = 603.25
B = 6 *(2 Yr)*
C = 0.79

NOMINAL PIPE SIZE USED

DESCRIPTION	FROM MH	TO MH	AREA (ha)	RUNOFF COEFFICIENT "R"	'AR'	ACCUM. 'AR'	RAINFALL INTENSITY (mm/hr)	FLOW (m3/s)	CONSTANT FLOW (m3/s)	ACCUM. CONSTANT FLOW (m3/s)	TOTAL FLOW (m3/s)	LENGTH (m)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (m3/s)	FULL FLOW VELOCITY (m/s)	INITIAL Tc (min)	TIME OF CONCENTRATION (min)	ACC. TIME OF CONCENTRATION (min)	PERCENT FULL (%)
Area 1 - Balsam Lane	STSI002408	STSI001196	0.34	0.90	0.31	0.31	67.5	0.058			0.058	28.3	1.00	300	0.097	1.37	10.00	0.34	10.34	60%
Area 2 - Proposed Site**	STSI00502A	STSI001196					67.5		0.053	0.053	0.053	54.7	0.80	300	0.086	1.22	10.00	0.75	10.75	61%
Area 3 - Balsam Lane	STSI001196	STSI002409	0.16	0.90	0.15	0.45	65.1	0.082		0.053	0.135	42.7	1.00	375	0.175	1.59	10.75	0.45	11.19	77%
Area 4 - Walkway*	STSI001236	STSI002409	0.06	0.90	0.05	0.05	67.5	0.010			0.010	22.5	1.00	250	0.059	1.21	10.00	0.31	10.31	17%
Area 5 - Balsam Lane	STSI002409	STSI001198	0.19	0.90	0.17	0.68	63.8	0.120		0.053	0.173	34.7	1.00	375	0.175	1.59	11.19	0.36	11.56	99%
Area 6 - Balsam Lane	STSI001198	STSI002410	0.10	0.90	0.09	0.77	62.7	0.134		0.053	0.187	12.5	1.00	375	0.175	1.59	11.56	0.13	11.69	107%

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[THE DIFFERENCE IS OUR PEOPLE]

Appendix D

Stormwater Management Calculations

BURNSIDE

CALCULATION SHEET

Project: **Mountain and Elm**
Grimsby, Ontario

Allowable Flows

Prepared by:	L.Galati
Checked by:	A. Kroetsch
Project No:	300053081
Date:	March 9, 2026

Runoff Equation Q = 2.78CIA (l/s)

where,
C = runoff coefficient
I = rainfall intensity (mm/hr)
A = area (ha)
2.78= conversion factor

Area			**C**	% Imp
101 - Site Area to onsite CBs and Balsam outlet	**2709**	m^2	0.9	100%
102 - Site Area to Balsam overland	**1102**	m^2	0.70	71%
103 - Site Area to Mountain and Elm	**899**	m^2	0.71	73%
Total	**4710**	m^2		

$$I = AT^c$$

I= Rainfall Intensity (mm/hr)
T= Time of concentration (hour)
(use T=10 min or 0.1666667hr)

Return Period	**A**	**B**	**C**	**T**	**I**
2 year	603.250	6.000	0.790	10 min	67.49 mm/hr
5 year	785.590	6.000	0.790	10 min	87.89 mm/hr
10 year	953.640	7.000	0.790	10 min	101.70 mm/hr
25 year	1119.020	7.000	0.790	10 min	119.34 mm/hr
50 year	1301.800	8.000	0.800	10 min	128.92 mm/hr
100 year	1426.130	8.000	0.800	10 min	141.23 mm/hr

Allowable Release Rates (Post to Pre):

	2 year	5 year	10 year	25 year	50 year	100 year
101 =	45.7	59.5	68.9	80.8	87.3	95.7
102 =	14.4	18.8	21.7	25.5	27.5	30.1
103 =	12.0	15.6	18.1	21.2	22.9	25.1
Total Site to Balsam Sewer	**60.1**	**78.3**	**90.6**	**106.3**	**114.8**	**125.8**
Total Site to Mountain/Elm ROW	**12.0**	**15.6**	**18.1**	**21.2**	**22.9**	**25.1**

Allowable Release Rates (For Balsam Sewer):
Areas 101 & 102 are draining to Balsam Steet.
Proposed Flows to match current 2-year flow to Balsam
2-Year Release to Balsam = 60.1 L/s

BURNSIDE

CALCULATION SHEET

Project: **Mountain and Elm**
Grimsby, Ontario

Proposed Flows

Prepared by:	L.Galati
Checked by:	A. Kroetsch
Project No:	300053081
Date:	March 9, 2026

Runoff Equation Q = 2.78CIA (l/s)

where,
C = runoff coefficient
I = rainfall intensity (mm/hr)
A = area (ha)
2.78= conversion factor

$I = AT^c$
I= Rainfall Intensity (mm/hr)
T= Time of concentration (hour)
(use T=10 min or 0.1666667hr)

Drainage Area 201

Total Area **4019** m^2 C **0.90**

Return Period	A	B	C	T	I	Q	Allowable
2 year	603.250	6.000	0.790	10 min	67.49 mm/hr	**67.82 L/s**	**60.11**
5 year	785.590	6.000	0.790	10 min	87.89 mm/hr	**88.31 L/s**	**60.11**
100 year	1426.130	8.000	0.800	10 min	141.23 mm/hr	**141.92 L/s**	**60.11**

Drainage Area 202 - Unbcontrolled to Elm Street

Total Area **287** m^2 C **0.90**

Return Period	A	B	C	T	I	Q
2 year	603.250	6.000	0.790	10 min	67.49 mm/hr	**4.84 L/s**
5 year	785.590	6.000	0.790	10 min	87.89 mm/hr	**6.31 L/s**
100 year	1426.130	8.000	0.800	10 min	141.23 mm/hr	**10.13 L/s**

Drainage Area 203 - Uncontrolled to Mountain Street

Total Area **360** m^2 C **0.90**

Return Period	A	B	C	T	I	Q
2 year	603.250	6.000	0.790	10 min	67.49 mm/hr	**6.07 L/s**
5 year	785.590	6.000	0.790	10 min	87.89 mm/hr	**7.91 L/s**
100 year	1426.130	8.000	0.800	10 min	141.23 mm/hr	**12.71 L/s**

Drainage Area 204 - Uncontrolled to Balsam Lane

Total Area **44** m^2 C **0.90**

Return Period	A	B	C	T	I	Q
2 year	603.250	6.000	0.790	10 min	67.49 mm/hr	**0.74 L/s**
5 year	785.590	6.000	0.790	10 min	87.89 mm/hr	**0.97 L/s**
100 year	1426.130	8.000	0.800	10 min	141.23 mm/hr	**1.55 L/s**

Total Post Development Drainage Area **4710** m^2

			Allowable
Total to Mountain and Elm Street ROW	2-year	**10.92**	**11.98**
	100-year	**22.85**	**25.08**

Net Site Conveyance
2 Year = 78.73 L/s
100 Year = 164.76 L/s

BURNSIDE

CALCULATION SHEET

Project: **Mountain and Elm**
Grimsby, Ontario

2- Year Design Storm

Prepared by: L.Galati
Checked by: A. Kroetsch
Project No: 300053081
Date: March 9, 2026

	A	B	C
2-year	603.3	6.00	0.79

Storm Vault - Area 201

Proposed Area	Area (m^2)	C
Total	**4,019**	**0.90**

Time (min)	Intensity (mm/hr)	Flows to Vault Runoff (L/s)	Storm Vault		Total Runoff From Vault (L/s)	Allowable Runoff from Site (L/s)
			Storage Vol. Req. (m^3)	Release Rate (L/s)		
5	90.74	91.2	19.5	26.3	26.3	60.1
10	67.49	67.8	24.9	26.3	26.3	60.1
15	54.44	54.7	25.6	26.3	26.3	60.1
20	45.99	46.2	23.9	26.3	26.3	60.1
25	40.02	40.2	20.9	26.3	26.3	60.1
30	35.56	35.7	17.0	26.3	26.3	60.1
35	32.09	32.2	12.5	26.3	26.3	60.1
40	29.30	29.4	7.5	26.3	26.3	60.1
45	27.01	27.1	2.2	26.3	26.3	60.1
50	25.09	25.2	0.0	25.2	25.2	60.1
55	23.45	23.6	0.0	23.6	23.6	60.1
60	22.03	22.1	0.0	22.1	22.1	60.1
120	13.22	13.3	0.0	13.3	13.3	60.1

Stormwater Vault Design

Quantity Control - Short Orifice Pipe

Inside diameter =	150	mm
Area =	0.0177	m2
Outlet Invert =	91.00	masl
Head =	0.35	m
HWL=	91.43	masl
C=	0.64	
Max Q=	26.3	L/s

Vault Sizing Calculations

Vault Area =	60.0	m^2
Total Vol Provided=	84.0	m^3
100-Yr Vol Required=	25.6	m^3
Top of Tank Elev =	92.40	masl
Bottom of Tank Elev =	90.85	masl
Tank HWL =	91.43	masl
Outlet Invert =	91.00	masl
Active Storage Depth =	0.43	m
Tank Height =	1.55	m

A

Allowable Release Rate (2-yr existing to Balsam) =	60.1 L/s
2-year Uncontrolled Release Rate to Balsam (Area 203) =	0.74
2-Yr Storm Peak Release Rate from Vault 1 =	**26.3 L/s**
Long-term groundwater discharge to Balsam =	**1.0 L/s**
Total 2-yr Post-development flow to Balsam =	**28.1 L/s**

BURNSIDE

CALCULATION SHEET

Project: **Mountain and Elm**
Grimsby, Ontario

5- Year Design Storm

Prepared by: L.Galati
Checked by: A. Kroetsch
Project No: 300053081
Date: March 9, 2026

	A	B	C
5-year	785.6	6.00	0.79

Storm Vault - Area 201

Proposed Area	Area (m^2)	C
Total	**4,019**	**0.90**

Time (min)	Intensity (mm/hr)	Flows to Vault Runoff (L/s)	Storm Vault		Total Runoff From Vault (L/s)	Allowable Runoff from Site (L/s)
			Storage Vol. Req. (m^3)	Release Rate (L/s)		
5	118.17	118.7	25.8	32.8	32.8	60.1
10	87.89	88.3	33.3	32.8	32.8	60.1
15	70.90	71.2	34.6	32.8	32.8	60.1
20	59.89	60.2	32.9	32.8	32.8	60.1
25	52.12	52.4	29.4	32.8	32.8	60.1
30	46.31	46.5	24.8	32.8	32.8	60.1
35	41.79	42.0	19.4	32.8	32.8	60.1
40	38.16	38.3	13.4	32.8	32.8	60.1
45	35.17	35.3	7.0	32.8	32.8	60.1
50	32.67	32.8	0.2	32.8	32.8	60.1
55	30.53	30.7	0.0	30.7	30.7	60.1
60	28.69	28.8	0.0	28.8	28.8	60.1
120	17.21	17.3	0.0	17.3	17.3	60.1

Stormwater Vault Design

Quantity Control - Short Orifice Pipe

Inside diameter =	150	mm
Area =	0.0177	m2
Outlet Invert =	91.00	masl
Head =	0.50	m
HWL=	91.58	masl
C=	0.64	
Max Q=	32.8	L/s

Vault Sizing Calculations

Vault Area =	60.0	m^2
Total Vol Provided=	84.0	m^3
100-Yr Vol Required=	34.6	m^3
Top of Tank Elev =	92.40	masl
Bottom of Tank Elev =	90.85	masl
Tank HWL =	91.58	masl
Outlet Invert =	91.00	masl
Active Storage Depth =	0.58	m
Tank Height =	1.55	m

A

Allowable Release Rate (5-yr existing to Balsam) =	60.1 L/s
5-year Uncontrolled Release Rate to Balsam (Area 203) =	0.97
5-Yr Storm Peak Release Rate from Vault 1 =	**32.8 L/s**
Long-term groundwater discharge to Balsam =	**1.0 L/s**
Total 5-yr Post-development flow to Balsam =	**34.7 L/s**

BURNSIDE

CALCULATION SHEET

Project: **Mountain and Elm**
Grimsby, Ontario

100-Yr Design Storm

Prepared by: L.Galati
Checked by: A. Kroetsch
Project No: 300053081
Date: March 9, 2026

	A	B	C
100-year	1426.1	8.0	0.80

Storm Vault - Area 201

Proposed Area	**Area (m^2)**	**C**
Total	**4,019**	**0.90**

Time (min)	**Intensity (mm/hr)**	**Flows to Vault Runoff (L/s)**	**Storm Vault**		**Total Runoff From Vault 1 (L/s)**	**Allowable Runoff from Site (L/s)**
			Storage Vol. Req. (m^3)	**Release Rate (L/s)**		
5	183.23	184.1	40.0	50.9	50.9	60.1
10	141.23	141.9	54.6	50.9	50.9	60.1
15	116.09	116.6	59.2	50.9	50.9	60.1
20	99.18	99.7	58.5	50.9	50.9	60.1
25	86.97	87.4	54.7	50.9	50.9	60.1
30	77.68	78.1	48.9	50.9	50.9	60.1
35	70.37	70.7	41.6	50.9	50.9	60.1
40	64.44	64.8	33.2	50.9	50.9	60.1
45	59.53	59.8	24.0	50.9	50.9	60.1
50	55.39	55.7	14.2	50.9	50.9	60.1
55	51.84	52.1	3.9	50.9	50.9	60.1
60	48.77	49.0	0.0	49.0	49.0	60.1
120	29.40	29.5	0.0	29.5	29.5	60.1

Stormwater Vault Design

Quantity Control - Short Orifice Pipe

Inside Diameter	150	mm
Area	0.0177	m2
Outlet Invert =	91.00	masl
Head =	1.11	m
HWL=	92.18	masl
C=	0.64	
Max Q=	50.9	L/s

Vault Sizing Calculations

Vault Area =	60.0	m^2
Total Vol Provided=	84.0	m^3
100-Yr Vol Required=	71.0	m^3
Top of Tank Elev =	92.40	masl
Bottom of Tank Elev =	90.85	masl
Tank HWL =	92.18	masl
Outlet Invert =	91.00	masl
Active Storage Depth =	1.18	m
Tank Height =	1.55	m
Freeboard =	0.22	m

Allowable Release Rate to Balsam =	60.11	L/s
100-year Uncontrolled Release Rate to Balsam (Area 203) =	1.55	L/s
100-Yr Storm Peak Release Rate from Vault 1 =	**50.92**	L/s
Long-term groundwater discharge to Balsam =	1.00	L/s
Total 100-yr post development flows to Balsam =	53.47	L/s

Stormceptor®

Rinker MATERIALS™

Stormceptor® EF Sizing Report

Imbrium® Systems
ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

05/11/2025

Province:	Ontario
City:	Grimsby
Nearest Rainfall Station:	HAMILTON RBG CS
Climate Station Id:	6153301
Years of Rainfall Data:	20

Site Name:	

Drainage Area (ha):	0.40
% Imperviousness:	100.00

Runoff Coefficient 'c': 0.90

Particle Size Distribution:	Fine
Target TSS Removal (%):	80.0

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	11.27
Oil / Fuel Spill Risk Site?	No
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	
Influent TSS Concentration (mg/L):	200
Estimated Average Annual Sediment Load (kg/yr):	502
Estimated Average Annual Sediment Volume (L/yr):	408

Project Name:	Woolverton
Project Number:	67737
Designer Name:	Laura Galati
Designer Company:	R.J. Burnside & Associates
Designer Email:	laura.galati@rjburnside.com
Designer Phone:	905-821-5945
EOR Name:	
EOR Company:	
EOR Email:	
EOR Phone:	

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EF4	88
EF5	92
EF6	94
EF8	98
EF10	99
EF12	100

Recommended Stormceptor EF Model: EF4

Estimated Net Annual Sediment (TSS) Load Reduction (%): 88

Water Quality Runoff Volume Capture (%): > 90

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THIRD-PARTY TESTING AND VERIFICATION

►**Stormceptor® EF and Stormceptor® EFO** are the latest evolutions in the Stormceptor® oil-grit separator (OGS) technology series, and are designed to remove a wide variety of pollutants from stormwater and snowmelt runoff. These technologies have been third-party tested in accordance with the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** and performance has been third-party verified in accordance with the **ISO 14034 Environmental Technology Verification (ETV)** protocol.

PERFORMANCE

►**Stormceptor® EF and EFO** remove stormwater pollutants through gravity separation and floatation, and feature a patent-pending design that generates positive removal of total suspended solids (TSS) throughout each storm event, including high-intensity storms. Captured pollutants include sediment, free oils, and sediment-bound pollutants such as nutrients, heavy metals, and petroleum hydrocarbons. Stormceptor is sized to remove a high level of TSS from the frequent rainfall events that contribute the vast majority of annual runoff volume and pollutant load. The technology incorporates an internal bypass to convey excessive stormwater flows from high-intensity storms through the device without resuspension and washout (scour) of previously captured pollutants. Proper routine maintenance ensures high pollutant removal performance and protection of downstream waterwavs.

PARTICLE SIZE DISTRIBUTION (PSD)

►The **Canadian ETV PSD** shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV ***Procedure for Laboratory Testing of Oil-Grit Separators*** for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

Stormceptor® EF Sizing Report

Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.50	9.1	9.1	0.50	30.0	25.0	100	9.1	9.1
1.00	19.0	28.0	1.00	60.0	50.0	100	19.0	28.0
2.00	15.5	43.5	2.00	120.0	100.0	96	14.9	42.9
3.00	12.1	55.6	3.00	180.0	150.0	89	10.8	53.7
4.00	8.2	63.8	4.00	240.0	200.0	83	6.8	60.5
5.00	6.5	70.4	5.00	300.0	250.0	81	5.3	65.8
6.00	5.5	75.9	6.00	360.0	300.0	78	4.3	70.1
7.00	3.2	79.0	7.01	420.0	350.0	76	2.4	72.5
8.00	2.9	81.9	8.01	480.0	400.0	74	2.2	74.7
9.00	3.2	85.2	9.01	540.0	450.0	73	2.4	77.0
10.00	2.7	87.9	10.01	600.0	500.0	72	2.0	79.0
11.00	1.7	89.6	11.01	661.0	550.0	72	1.3	80.3
12.00	1.5	91.1	12.01	721.0	600.0	71	1.0	81.3
13.00	1.1	92.2	13.01	781.0	651.0	70	0.8	82.1
14.00	0.9	93.1	14.01	841.0	701.0	70	0.6	82.7
15.00	1.4	94.5	15.01	901.0	751.0	70	1.0	83.7
16.00	0.6	95.1	16.01	961.0	801.0	69	0.4	84.1
17.00	0.5	95.6	17.01	1021.0	851.0	69	0.3	84.4
18.00	0.3	95.9	18.01	1081.0	901.0	68	0.2	84.7
19.00	0.5	96.4	19.02	1141.0	951.0	68	0.4	85.0
20.00	0.4	96.8	20.02	1201.0	1001.0	68	0.3	85.3
21.00	0.8	97.6	21.02	1261.0	1051.0	69	0.5	85.8
22.00	0.2	97.8	22.02	1321.0	1101.0	70	0.1	86.0
23.00	0.4	98.2	23.02	1381.0	1151.0	71	0.3	86.3
24.00	0.7	98.9	24.02	1441.0	1201.0	72	0.5	86.7
25.00	0.0	98.9	25.02	1501.0	1251.0	73	0.0	86.7
30.00	0.7	99.7	30.02	1801.0	1501.0	70	0.5	87.3
35.00	0.3	100.0	35.03	2102.0	1751.0	60	0.2	87.5
40.00	0.0	100.0	40.03	2402.0	2002.0	53	0.0	87.5
45.00	0.0	100.0	45.04	2702.0	2252.0	47	0.0	87.5
Estimated Net Annual Sediment (TSS) Load Reduction =								**87 %**

Climate Station ID: 6153301 *Years of Rainfall Data*: 20

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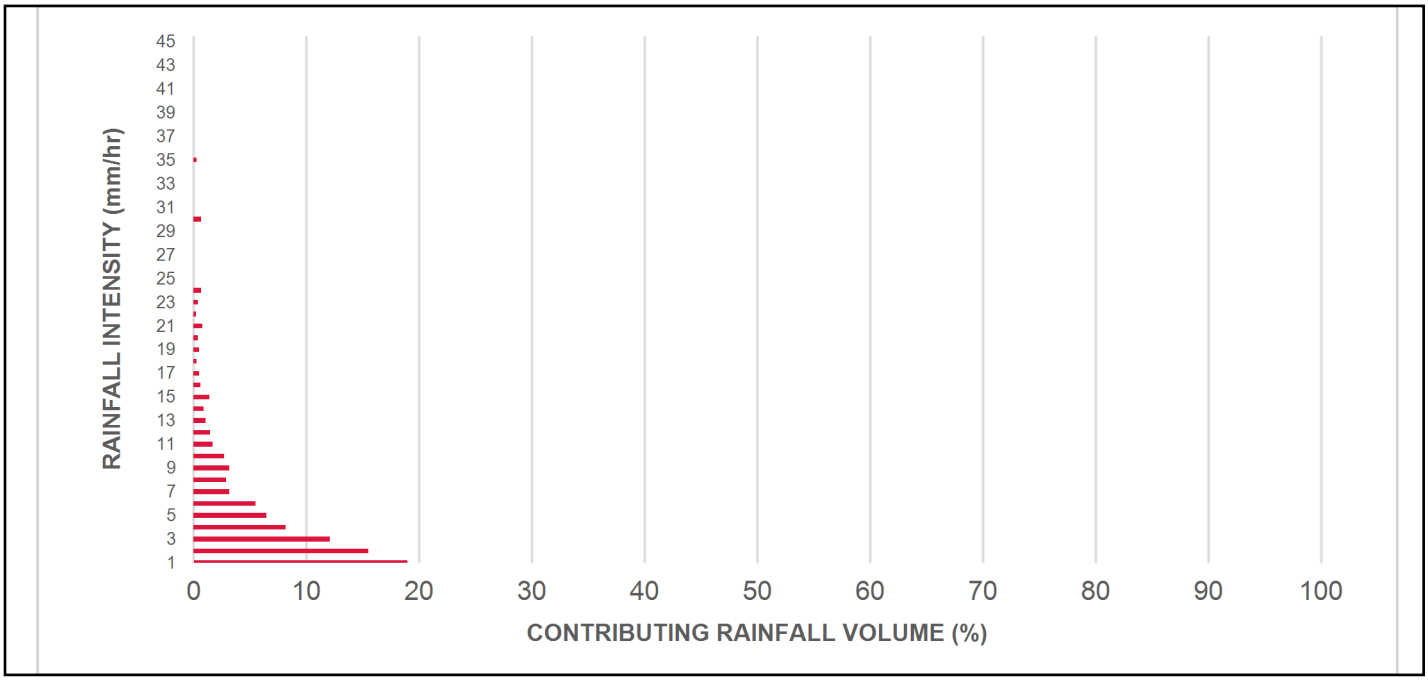
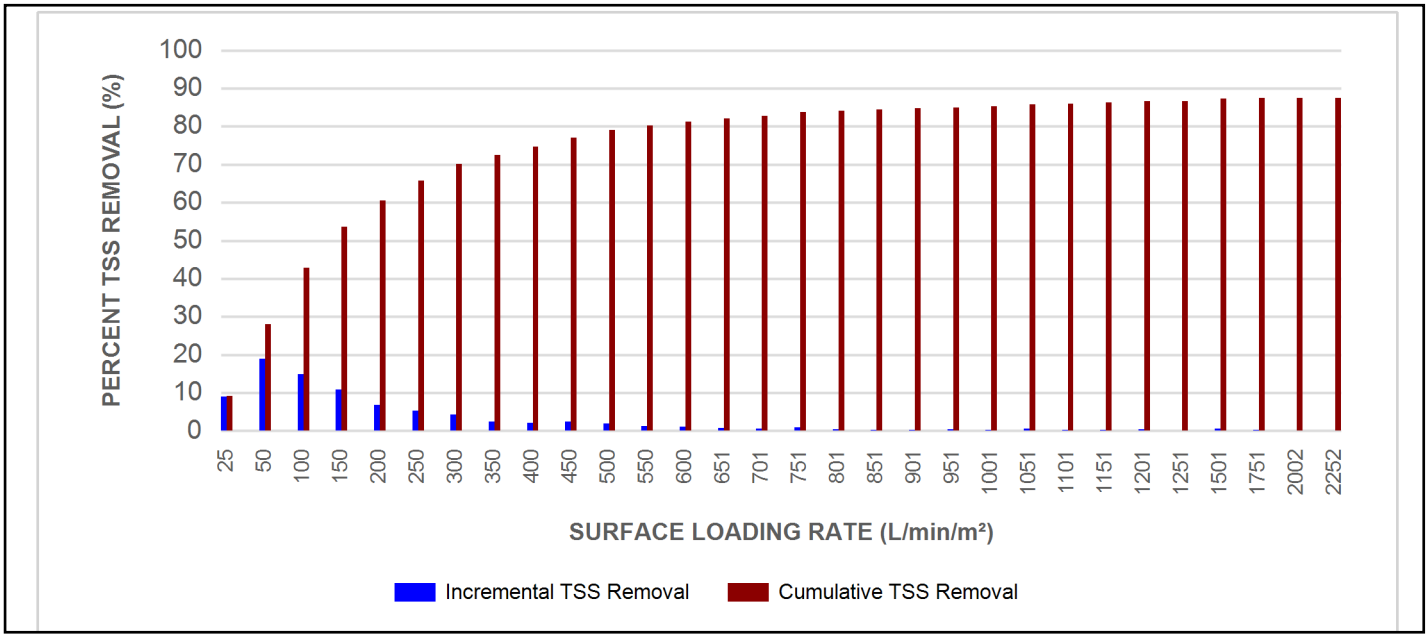
RAINFALL DATA FROM HAMILTON RBG CS RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



Maximum Pipe Diameter / Peak Conveyance

Stormceptor EF / EFO	Model Diameter		Min Angle Inlet / Outlet Pipes	Max Inlet Pipe Diameter		Max Outlet Pipe Diameter		Peak Conveyance Flow Rate	
	(m)	(ft)		(mm)	(in)	(mm)	(in)	(L/s)	(cfs)
EF4 / EFO4	1.2	4	90	609	24	609	24	425	15
EF5 / EFO5	1.5	5	90	762	30	762	30	710	25
EF6 / EFO6	1.8	6	90	914	36	914	36	990	35
EF8 / EFO8	2.4	8	90	1219	48	1219	48	1700	60
EF10 / EFO10	3.0	10	90	1828	72	1828	72	2830	100
EF12 / EFO12	3.6	12	90	1828	72	1828	72	2830	100

SCOUR PREVENTION AND ONLINE CONFIGURATION

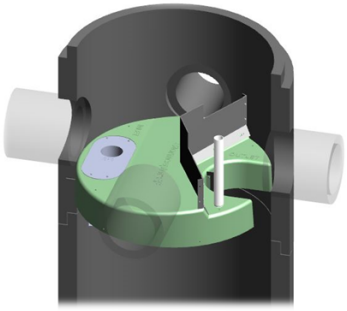
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

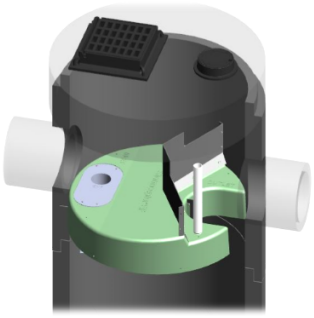
DESIGN FLEXIBILITY

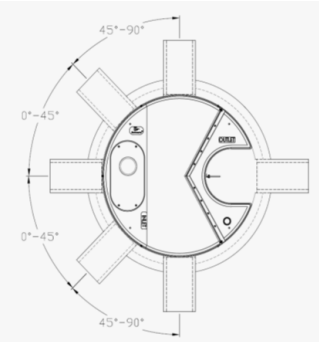
►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, and can be modified to ensure performance in submerged conditions.

OIL CAPTURE AND RETENTION

►While Stormceptor® EF will capture and retain oil from dry weather spills and low intensity runoff, **Stormceptor® EFO** has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**. Stormceptor EFO is recommended for sites where oil capture and retention is a requirement.







INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.

0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.

45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS

The head loss through Stormceptor EF is similar to that of a 60-degree bend structure. The applicable K value for calculating minor losses through the unit is 1.1. For submerged conditions the applicable K value is 3.0.

Pollutant Capacity

Stormceptor EF / EFO	Model Diameter		Depth (Outlet Pipe Invert to Sump Floor)		Oil Volume		Recommended Sediment Maintenance Depth *		Maximum Sediment Volume *		Maximum Sediment Mass **	
	(m)	(ft)	(m)	(ft)	(L)	(Gal)	(mm)	(in)	(L)	(ft^3)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	265	70	203	8	1190	42	1904	5250
EF5 / EFO5	1.5	5	1.62	5.3	420	111	305	10	2124	75	2612	5758
EF6 / EFO6	1.8	6	1.93	6.3	610	160	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	1070	280	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	1670	440	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	2475	655	610	24	31220	1103	49952	137875

*Increased sump depth may be added to increase sediment storage capacity

** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft^3)

Feature	Benefit	Feature Appeals To
Patent-pending enhanced flow treatment and scour prevention technology	Superior, verified third-party performance	Regulator, Specifying & Design Engineer
Third-party verified light liquid capture and retention for EFO version	Proven performance for fuel/oil hotspot locations	Regulator, Specifying & Design Engineer, Site Owner
Functions as bend, junction or inlet structure	Design flexibility	Specifying & Design Engineer
Minimal drop between inlet and outlet	Site installation ease	Contractor
Large diameter outlet riser for inspection and maintenance	Easy maintenance access from grade	Maintenance Contractor & Site Owner

STANDARD STORMCEPTOR EF/EFO DRAWINGS

For standard details, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

STANDARD STORMCEPTOR EF/EFO SPECIFICATION

For specifications, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

STANDARD PERFORMANCE SPECIFICATION FOR "OIL GRIT SEPARATOR" (OGS) STORMWATER QUALITY TREAMENT DEVICE

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program's **Procedure for Laboratory Testing of Oil-Grit Separators.**

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The **minimum** sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1	4 ft (1219 mm) Diameter OGS Units:	1.19 m^3 sediment / 265 L oil
	5 ft (1524 mm) Diameter OGS Units:	1.95 m^3 sediment / 420L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m^3 sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m^3 sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m^3 sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m^3 sediment / 2,476 L oil

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

3.2.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/m^2 to 1400 L/min/m^2, and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.2.2 Sediment removal efficiency for surface loading rates between 40 L/min/m^2 and 1400 L/min/m^2 shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.2.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/m^2 shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m^2. No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m^2.

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m^2 shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m^2, and shall be calculated using a simple proportioning formula, with 1400 L/min/m^2 in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/m^2.

The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.**

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m^2.

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix E

Sanitary Calculations

BURNSIDE

CALCULATION SHEET

Project:	**13 Mountain St & 19 Elm St** **Grimsby, Ontario**	Prepared by: Checked by: Project No: Date:	L.Galati A.Kroetsch 300053081 March 8, 2026

Sanitary Servicing Analysis

Commercial

Commercial Population 500 sq.ft (46.5 m^2) per employee = 0.0215 P/m^2

(per Regional Municipality of Niagara Development Charges Background Study (May 30, 2022) [Prepared By: Watson & Associates])

Building Address	Stories	Building Area (m^2)	GFA (ha)	P/m^2	Population
Existing Woolverton Hall	1	156.2	0.016	0.0215	3
New Commercial	1	277.6	0.028	0.0215	6
Total					**9**

$Q_{(ICI)}$= 310 L/cap/day (Niagara Region Water & Wastewater Master Servicing Plan (2021) Volume 4)

$$M = 1 + \frac{14}{4+(P/1000)^{1/2}}$$

M= 4.00 (Value between 2 and 4)

$Q_{(ICI)}$= 0.13 L/s

Residential

	Units	PPU	Population
Studio & 1 Bedroom=	36	1.2	43
2 & 3 Bedroom =	114	2	228
Total=	**150**		**271**

PPU from: Regional Municipality of Niagara Development Charges Background Study (May 30, 2022) [Prepared By: Watson & Associates]

Q= 255 L/cap/day

$$Q = \frac{P \times Q \times M}{86400} + (A \times I)$$

$$M = 1 + \frac{14}{4+(P/1000)^{1/2}}$$

M= 4.00 (Value between 2 and 4)

$Q_{(residential)}$= 3.20 L/s

Infiltration

Infiltration Allowance= 0.4 L/s/ha (Niagara Region Water & Wastewater Master Servicing Plan (2021) Volume 4)

A= 0.34 ha

$Q_{infiltration}$= 0.14 L/s

$Q_{proposed\ total}$ = 3.47 L/s

Laura Galati

From: Jingshu Wang <jwang@studiojci.com>
Sent: Friday, March 13, 2026 7:09 PM
To: Sanjam Raisuada; Allison Chewter; Victoria Borsodi; Sudipto Sengupta; Audric Montuno; Celina Hevesi; Steven Pignataro; Stephanie A. Hardes; Harley Valentine; Michael Wong; Samantha Menard; Angela Kroetsch; Laura Galati; Brianna Brown
Subject: The Woolverton_Issued for ZBA2(Draft)

Importance: High

Hi All,

Please find the attached draft issued for the ZBA2 set for your coordination. Instead of the 2.5 m setback on the 7th floor, we are now proposing an additional 1.5 m setback at the northwest volume.

260313_ZBA2_Draft

Current unit mix is as shown below:

UNIT COUNT

FLOORS	Studio	1b	2b	3b	Total
	#	#	#	#	0
GF	0	0	0	0	0
INT	0	0	0	0	0
2	2	8	13	4	27
3	1	9	17	2	29
4	4	1	18	1	24
5	4	1	18	1	24
6	2	1	20	0	23
7	2	1	20	0	23
MPH	0	0	0	0	0
Total	**15**	**21**	**106**	**8**	**150**
%	**10%**	**14%**	**71%**	**5%**	**100%**

@Sanjam, we have placed today's date on the drawings as a placeholder. Please let us know what date should be shown on the drawings for the final submission set.
@Steven, please note that the client may reduce one parking space. This will be further discussed next Monday, and we will keep you informed.

Thank you,

Jingshu Wang

M.Arch.,OAA
Project Manager

T. 416 901 6528 x 105
E. jwang@studiojci.com

STUDIO JCI

BURNSIDE

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Appendix F

Hydrogeological Investigations

Updated Hydrogeological Investigation

Proposed Residential Development
13 Mountain Street and 19, 21 & 23 Elm Street
Grimsby, Ontario

Prepared For:

Woolverton Holdings Corp.

Project No.: 25-403-100
Date: January 9th, 2026

DS CONSULTANTS LTD.
6221 Highway 7, Unit 16
Vaughan, Ontario, L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

25-403-100 **January 9th, 2026**

Woolverton Holdings Corp.

Attention: Sanjam Raisuada, Development Coordinator
Via Email: sanjam@castlepointnuma.com

RE: Hydrogeological Investigation – 13 Mountain Street and 19, 21 & 23 Elm Street, Grimsby, Ontario

DS Consultants Limited (DS) was retained by Woolverton Holdings Corp to complete a hydrogeological investigation for the proposed development at 13 Mountain Street and 19, 21 & 23 Elm Street in the Town of Grimsby (hereinafter referred to as "the Site"). The site is an approximate 4,710 m^2 parcel of land located on the northeast corner of the intersection of Mountain Street and Elm Street in Grimsby. The Site is occupied by a residential house at 13 Mountain Street which has been converted to an office space, a former church at 19 Elm Street which recently used as commercial purposes, a dental clinic at 21 Elm Street and a residential dwelling at 23 Elm Street. The remainder of the Site is paved and used for surface parking. It is DS's understanding that the proposed development consists of construction of an 8-storey building with one (1) level of underground parking (P1).

The average existing ground elevation at the site is approximately 94 meters above sea level (masl). Based on the architectural drawings provided to DS (Studio JCI, issued on May 16, 2025), the stablished grade is at 94.45 masl and the finished floor elevation of P1 is at 90.42 masl. Considering the footings and elevator shaft, the maximum excavation depth would be approximately 5.5 meters below ground surface (mbgs) or an approximate elevation of 88.5 masl.

The hydrogeological investigation report has been prepared based on the monitoring wells installed by DS as part of Phase 2 environmental assessment as well as monitoring wells installed by other consultants in March 2021 in support of previous geotechnical and hydrogeological investigations. If needed, the results of this investigation can be used in support of an Environmental Activity Sector Registry (EASR) for construction dewatering from the Ministry of the Environment Conservation and Parks (MECP).

Based on the results of this investigation, the following conclusions and recommendations are presented:

1. Based on the MECP water well records search, there are fifty-three (53) water wells within 500 meters of the development site. No water well is noted as a water supply well (domestic, irrigation, industrial or commercial). All wells are noted as test holes, monitoring wells, not in use or unknown. The study area is serviced with municipal water and therefore, no groundwater users are expected in the area.
2. The investigation included the drilling of eight (8) boreholes (BH1 to BH8) by other consultants to depths ranging from 2 to 18.4 mbgs, with six (6) monitoring wells installed in selected boreholes BH1 to BH6 at depths ranging from 6.1 to 9.8 mbgs. For the purpose of the current investigation, DS utilized four (4) accessible existing monitoring well (BH1, BH3, BH4 and BH5) as well as one (1) monitoring well installed by DS in November 2024 as part of a previous environmental assessment.
3. The surficial geology at the site is characterized as Older alluvial deposits, Coarse-textured glaciolacustrine deposits, Till consists of clay to silt-textured till (derived from glaciolacustrine deposits

or shale) and Paleozoic bedrock. The overburden geology at the site generally consisted of native layer of clayey silt with gravel and some sand extending to depths of 12.6 to 18.3 mbgs. Reddish brown weathered shale bedrock was encountered at a depth of 18.3 mbgs (elevation 74.8 masl).

4. DS measured groundwater levels in accessible monitoring wells on November 26th, 2025. The groundwater level in overburden wells was found at the depth ranging from 1.68 to 4.32 mbgs (Elev. 90.17-91.12 masl). The groundwater levels are subject to seasonal fluctuations and may vary in response to changing climate conditions. The groundwater flow direction is expected to be westerly towards Forty Mile Creek located approximately 120 m west of the site.

5. A total of five (5) Single Well Response Tests (slug test) were completed by DS on November 26th, 2025, to estimate hydraulic conductivity (k) for the representative geological units in which the wells were screened. Hydraulic conductivity (k) values were calculated using the Hvorslev method using the AquiferTest® Software. The results indicated that the k-value is ranging from 1.29×10^{-7} to 1.65×10^{-6} m/s.

6. To assess the suitability for discharge of groundwater to the Niagara Region's Storm Sewers, one (1) unfiltered groundwater sample was collected from monitoring well BH1 on November 26th, 2025. The reported analytical results indicate that there were no exceedances against the Storm Sewer Use By-Law as well as no exceedances reported against the Region's Sanitary Sewer-Use By-Law. As per the Region's Sewer Use Bylaw, no dewatering flows are permitted to be discharged to the sanitary sewer system and all dewatering flows (either temporary during construction or permanent following completion of all construction) are to be directed to the storm sewer system. Therefore, water can be discharged to the Niagara's storm sewer without pre-treatment.

7. The total estimated short-term dewatering rate for the proposed development with one (1) level of underground parking considering the unsealed excavation method would be 67,600 L/day (67.6 m^3/day). This estimated conservative value incorporates a safety factor of x2 and a theoretical 10 mm storm event per day estimated at 45,000 L/day (45 m^3/day) into the open excavation during construction.

8. Following the construction of the underground structure, long-term groundwater flow to the underfloor drainage system for the building will be a function of the upward flux and drainage along the foundation wall. Based on the assumed design, depth to water and given k-value, the estimated permanent theoretical flow would expect to be 9,000 L/day (9 m^3/day). However, if a safety factor x2 is included, a conservative permanent flow of 18,000 L/day (18 m^3/day) will be needed to be pumped into the sewer system to manage any unforeseen groundwater issues in the future.

9. There are structures and utilities (structures, buildings, sewers, roads, etc.) expected within the predicted zone of influence, which is estimated at 44 meters from the center of the excavation when considering an unsealed excavation. Since the proposed construction is anticipated to be constructed within the till deposits with relatively low conductivity, an effect of settlement due to dewatering would not be expected. However, DS recommends consulting geotechnical consultants for

settlement monitoring requirements to access potential settlement due to any dewatering activities at the site during construction.

10. Once a groundwater dewatering system is set up at the Site, daily and weekly monitoring should be implemented during construction to assess the groundwater conditions such as water levels, measurement of discharge flow, discharge water quality and any adverse impacts as a result of dewatering including settlement.

11. Following the completion of construction activities, all dewatering wells, well points or eductors if any and monitoring wells installed at various stages of this project must be decommissioned. The installation and eventual decommissioning of the wells and the dewatering system must be carried out by a licensed water well contractor in accordance with Regulation 903 of the Ontario Water Resources Act.

Should you have any questions regarding these findings, please contact the undersigned.

DS Consultants Ltd.

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Martin Gedeon, M.Sc., P.Geo.
Vice-President, Senior Hydrogeologist

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FIGURES

APPENDICES:

1.0 INTRODUCTION

DS Consultants Limited (DS) was retained by Woolverton Holdings Corp to complete a hydrogeological investigation for the proposed development at 13 Mountain Street and 19, 21 & 23 Elm Street in the Town of Grimsby (hereinafter referred to as "the Site"). The site is an approximate 4,710 m2 parcel of land located on the northeast corner of the intersection of Mountain Street and Elm Street in Grimsby. The Site is occupied by a residential house at 13 Mountain Street which has been converted to an office space, a former church at 19 Elm Street which recently used as commercial purposes, a dental clinic at 21 Elm Street and a residential dwelling at 23 Elm Street. The remainder of the Site is paved and used for surface parking. It is DS's understanding that the proposed development consists of construction of an 8-storey building with one (1) level of underground parking (P1). **Figure 1** presents the site location map that highlights the location of the site and the surrounding area.

The average existing ground elevation at the site is approximately 94 meters above sea level (masl). Based on the architectural drawings provided to DS (Studio JCI, issued on May 16, 2025), the stablished grade is at 94.45 masl and the finished floor elevation of P1 is at 90.42 masl. Considering the footings and elevator shaft, the maximum excavation depth would be approximately 5.5 meters below ground surface (mbgs) or an approximate elevation of 88.5 masl.

This hydrogeological investigation includes an overview of the existing geological and hydrogeological conditions at the Site and the surrounding area, an assessment of the hydrogeological constraints, and impacts of the proposed development on the local groundwater and provides an estimation of construction dewatering and permanent drainage requirements during the proposed development phase. This investigation is based on the monitoring wells installed by DS as part of Phase 2 environmental assessment as well as monitoring wells installed by other consultants in March 2021 in support of previous geotechnical and hydrogeological investigations.

1.1 Purpose

The purpose of this Hydrogeological Investigation is to assess the current groundwater conditions at the Site to evaluate the following:

- Temporary construction dewatering for the excavations of the proposed building on Site;
- Explore the potential need for an Environmental Activity and Sector Registration (EASR) for Construction Dewatering from the MECP;
- Temporary management and discharge of groundwater during short-term construction dewatering
- Asses permanent drainage requirements; and
- Assess groundwater quality to identify potential adverse impacts to Region's sewer system.

1.2 Scope of Work

The scope of work for this investigation included:

- Site visits;
- Collecting and interpreting available reports and data including the MECP Water Well Records (WWR), geotechnical, hydrogeological, and environmental studies completed at the Site;
- In-situ hydraulic conductivity testing of monitoring wells;
- Estimation of temporary groundwater flow rate during the construction;
- Estimation of long-term or permanent discharge rate after the construction;
- Assessing groundwater quantity and quality to evaluate discharge options;
- Assessing potential impacts due to dewatering activities; and,
- Data analyses and report preparation.

2.0 PREVIOUS INVESTIGATIONS

DS reviewed the Hydrogeological Assessment completed by Terraprobe in July 2021. The assessment was conducted based on concurrent geotechnical, environmental and hydrogeological investigations completed for the subject property at 13 Mountain Street and 19 Elm Street according to former design for 7-storey building with three (3) levels of underground parking (P3).

The investigation included the drilling of eight (8) boreholes (BH1 to BH8) to depths ranging from 2 to 18.4 metres below ground surface (mbgs), with six (6) monitoring wells installed in selected boreholes BH1 to BH6 at depths ranging from 6.1 to 9.8 mbgs.

3.0 FIELDWORK

- For the purpose of the current investigation DS utilized four (4) accessible existing monitoring well (BH1, BH3, BH4 and BH5) installed Terraprobe as well as one (1) monitoring well installed by DS in November 2024 as part of phase 2 environmental assessment. All monitoring wells were developed before any use to allow for groundwater level monitoring, hydraulic conductivity testing, and to assess groundwater quality.
- A total of five (5) single well response tests (SWRT) were completed by performing a rising head test (slug test) to estimate the hydraulic conductivity values of soils at the site. There was not sufficient water in monitoring well MW3 and MW4 to conduct the slug test.

- One (1) unfiltered groundwater sample was also collected and analyzed for the parameters listed under the Niagara Sewer Use ByLaw – (Sanitary and Storm Sewer Discharge - BL_2024_51) to assess groundwater quality. The borehole (BH) and monitoring well (MW) location plan is shown in **Figure 3**.

3.0 PHYSICAL SETTING

Available topographic maps and environmental, geotechnical and hydrogeological reports were used to develop an understanding of the physical setting of the study area. Borehole logs and the Ministry of the Environment, Conservation and Parks Water Wells Records (MECP WWRs) were used to interpret the geological and hydrogeological conditions at the development site.

3.1 Physiography and Drainage

The topography at the development site is flat with a surface elevation of about 94 masl. The topography within the study area slopes to the north, towards Like Ontario. Drainage is controlled by underground utilities. There are no surface water features at the site. The nearest water body is Forty Mile Creek, located approximately 120 meters west of the site. The creek ultimately discharges into Lake Ontario, which lies about 1.5 kilometres north of the site.

3.2 Geology

The following presents a brief description of regional and development site geology based on the review of available information and development site-specific soil investigations.

3.2.1 Quaternary Geology

According to the Ontario Geological Survey mapping across the region, the site lies within the Sand Plains physiographic region of southern Ontario, and the quaternary geology of the Site is characterized by Halton Till deposits predominantly silt to silty clay matrix, high in matrix carbonate content and clast poor of Pleistocene. The surficial geology at the site is characterized as Older alluvial deposits, Coarse-textured glaciolacustrine deposits, Till consists of clay to silt-textured till (derived from glaciolacustrine deposits or shale) and Paleozoic bedrock. The surficial geology map is shown in **Figure 2.**

3.2.2 Bedrock Geology

According to the Ontario Geological Survey mapping across the region, the bedrock at the site is predominantly comprised of Sandstone, shale, dolostone and siltstone of the Lockport Formation. Bedrock was encountered during drilling activities conducted for previous investigations at the depth of 18.3 mbgs, corresponding to elevation 74.8 masl.

3.2.3 Site Geology

On-site subsurface soil conditions were summarised from the subsurface geotechnical site investigation at the site by Terraprobe. Detailed subsurface conditions are presented in **Figure 4** and the borehole logs are in **Appendix A**. The subsurface conditions in the boreholes are summarized in the following paragraphs.

Surficial Materials: All boreholes except BH6 penetrated asphaltic concrete ranging in thickness from approximately 25 to 55 mm. A granular base layer varying in thickness from 50 to 360 mm was encountered below the asphaltic concrete. BH6 encountered approximately 100 mm of pea gravel at the surface.

Fill Material: Underlying the surficial material at all borehole locations, a layer of fill material was encountered extending to depth of 2.3 to 4 mbgs. The fill material was variable but typically consisted of sand and gravel with varying amounts of silt and clay. Trace brick fragments were observed within the fill material at BH3 and BH4.

Clayey Silt Glacial Till: Underlying the fill material, all boreholes encountered a native layer of clayey silt with gravel and some sand extending to depths of 12.6 to 18.3 mbgs. Borehole BH1, BH3, BH5 and BH7 encountered trace red shale fragments between 7.6 to 9.1 mbgs. All boreholes except BH5 were terminated within the clayey silt.

Bedrock: Borehole BH5 encountered reddish brown weathered shale at a depth of 18.3 mbgs (elevation 74.8 masl). BH5 was terminated within the weathered shale.

3.3 Hydrogeology

The hydrogeology at the development site was evaluated using the on-site monitoring wells installed by DS and other consultants, local domestic wells and existing hydrogeological and geotechnical reports.

3.3.1 Local Groundwater Use

As part of the hydrogeological study, DS completed a search of the Ministry of the Environment, Conservation and Parks (MECP) Water Well Records (WWR) database. Based on the MECP water well records search, there are fifty-three (53) water wells within 500 meters of the development site (**Appendix D**). No water well is noted as a water supply well (domestic, irrigation, industrial or commercial). All wells are noted as test holes, monitoring wells, not in use or unknown. **Figure 1** shows the MECP water well location plan. The study area is serviced with municipal water and therefore, no groundwater users are expected in the area.

3.3.2 Groundwater Conditions

DS measured groundwater levels in monitoring wells on November 26th, 2025. **Table 3-1** presents the groundwater levels in all accessible monitoring wells. The groundwater level in overburden wells was

found at the depth ranging from 1.68 to 4.32 mbgs (Elev. 90.17-91.12 masl). The groundwater levels are subject to seasonal fluctuations and may vary in response to changing climate conditions. The groundwater flow direction is expected to be westerly towards Forty Mile Creek located approximately 120 m west of the site.

Table 3-1: Groundwater Levels in Monitoring Wells

Well ID	Ground Elevation (masl)	Screened Interval (mbgs)	November 26th ,2025	
			Depth to Water (mbgs)	Groundwater Elevation (masl)
BH1	92.8	6.6-9.6	1.68	91.12
BH3	95.0	6.6-9.6	4.29	90.71
BH4	94.7	3.1-6.1	4.32	90.38
BH5	93.1	3.1-6.1	2.15	90.95
BH24-1	93.7	4.6-8.4	3.53	90.17

3.3.3 Hydraulic Conductivity

A total of five (5) Single Well Response Tests (slug test) were completed by DS on November 26th, 2025, to estimate hydraulic conductivity (k) for the representative geological units in which the wells were screened. SWRT was completed by performing a rising head test (slug test) with the use of Waterra® tubing to 'instantaneously' remove water from the well. A data logger was placed at the bottom of the well to accurately measure the change in the hydraulic head versus time. Hydraulic conductivity (k) values were calculated using the Hvorslev method using the AquiferTest® Software. The semi-log plots for normalized drawdown versus time are provided in **Appendix B.** The results indicated that the k-value is ranging from 1.29×10^{-7} to 1.65×10^{-6} m/s. **Table 3-2** presents the Hydraulic Conductivity (k) value for the representative geological unit.

Table 3-2: Summary of Hydraulic Conductivity (k) Test Results

Well ID	Screened Interval (mbgs)	Screened Formation	K-value (m/s)	Geo-mean (m/s)
BH1	6.6-9.6	Clayey Silt with Gravel	1.65×10^{-6}	2.98×10^{-7}
BH3	6.6-9.6	Clayey Silt with Gravel	1.46×10^{-7}	
BH4	3.1-6.1	Clayey Silt with Gravel	5.28×10^{-7}	
BH5	3.1-6.1	Clayey Silt with Gravel	1.29×10^{-7}	
BH24-1	4.6-8.4	Clayey Silt with Gravel	1.44×10^{-7}	

3.3.4 Groundwater Quality

One (1) unfiltered groundwater sample was collected from monitoring well BH1 on November 26th, 2025, to assess the suitability for discharge of groundwater to the Niagara Region's Sanitary/Storm Sewers system. The groundwater samples were submitted to SGS Laboratories in Lakefield, Ontario. SGS is certified by the Canadian Association of Laboratory Accreditation Inc. (CALA) and the Canadian Standard

Association (CSA). The analytical results were compared to Table 1- Limits for Sanitary Sewer Discharge, and Table 2 Limits for Storm Sewer Discharge. The reported analytical results indicate that there were no exceedances against the Storm Sewer Use By-Law as well as no exceedances reported against the Region's Sanitary Sewer-Use By-Law.

As per the Region's Sewer Use Bylaw, no dewatering flows are permitted to be discharged to the sanitary sewer system and all dewatering flows (either temporary during construction or permanent following completion of all construction) are to be directed to the storm sewer system. Therefore, water can be discharged to the Niagara's storm sewer without pre-treatment. The certificates of analyses are provided in **Appendix C.**

4.0 CONSTRUCTION DEWATERING

The proposed development consists of construction of an 8-storey building with one (1) level of underground parking (P1). Based on the architectural drawings provided to DS (Studio JCI, issued on May 16, 2025), the stablished grade is at 94.45 masl and the finished floor elevation of P1 is at 90.42 masl. Considering the footings and elevator shaft, the maximum excavation depth would be approximately 5.5 mbgs or an approximate elevation of 88.5 masl. For construction dewatering purposes, the groundwater level should be lowered at least one (1) m below the footings and elevator shaft elevation at about 87.5 masl. The unsealed construction excavation method with approximate excavation dimensions of 75 m long and 60 m wide for considered for the proposed development. Since the proposed underground structure will be below the groundwater table, dewatering will be required during the excavation of overburden material.

4.1 Estimation of Flow Rate - Unsealed Excavation

This section calculates the estimated dewatering required during the construction of the proposed building based on the geo-mean k-value, and the highest groundwater elevations at the site using the steady-state flow equation for unsealed excavation as follows. The estimated flow rates for the proposed buildings are summarised in Table 4-1.

$$Q_R = K\,x\frac{H^2 - h^2}{0.733}\,x\,Log\,(R_0/r_e)$$

$$r_e = \left(\frac{(a\,x\,b)}{\pi}\right)^{0.5}$$

$$R_0 = (r_e + 3000)(H - h)(k^{0.5})$$

Table: 4-1 Estimation of Flow Rate (Short-term Discharge) - Unsealed Excavation

Parameters	P1
K -Hydraulic conductivity (m/s)- Geo-mean Clayey Silt Till	2.98×10^{-7}
H-Distance from water level to the bottom of an aquifer (m)	6.35
h -Depth of water in the well while pumping (m)	1
a- length of excavation (m)	76
b- Width of excavation (m)	60
r_e–equivalent radius, where a and b excavation dimensions (m)	38
R_o- Radius of the cone of depression	44
Estimated Flow Rate- L/day (without safety factor)	11,300
Estimated Flow Rate- L/day (with a safety factor x 2)	22,600

4.2 Estimation of Flow Rate- Storm Water Consideration

During construction, additional removal of stormwater from precipitation into the open excavation will be required. The estimated flow rate is based on the excavation dimensions for the entire development and a theoretical 10 mm precipitation event in 24 hours. The total estimated dewatering that might be needed as a result of a 10 mm precipitation event would be approximately 45,000 L/day (45 m^3/day).

4.3 Total Estimation of Flow Rate (Short-Term/ Temporary Discharge)

Considering the unsealed excavation method, the recommended pumping rate for the proposed development considering one (1) level of underground parking would be approximately **67,600 L/day (67.6 m^3/day)**. These values incorporate a safety factor of x2 and account for stormwater as a result of a 10 mm precipitation event. The recommended flow rates for the proposed buildings are summarised in Table 4-2.

Table 4-2: Total Construction Dewatering (Short-term Discharge) - Unsealed Excavation

U/G	Flow Rate Q- without a safety factor (L/day)	Flow Rate Q- with a safety factor x2 (L/day)	Storm water (@ 10 mm/24 hrs.) (L/day)	Designed Flow Rate Or Total Flow Rate (L/day)
P1	11,300	22,600	45,000	67,600

It is expected that the initial dewatering rate will be higher to remove groundwater within the overburden formation. The dewatering rates are expected to decrease once the target water level is achieved in the excavation footprint as groundwater will have been removed locally from storage resulting in lower seepage rates into the excavation. The maximum flow calculation is intended to provide a conservative value to account for unforeseeable conditions that may arise during construction.

4.4 Permanent Drainage (Long-term Discharge)

Following the construction of the underground structure, long-term groundwater flow to the underfloor drainage system for the building will be a function of the upward flux and drainage along the foundation wall. Based on the assumed design, depth to water and given k-value, the estimated permanent theoretical flow would expect to be 9,000 L/day (9 m^3/day). However, if a safety factor x2 is included, a conservative permanent flow of **18,000 L/day (18 m^3/day)** will be needed to be pumped into the sewer system to manage any unforeseen groundwater issues in the future.

4.5 Permit Requirements

4.5.1 Environmental Activity and Sector Registry (EASR) /Permit to Take Water (PTTW) Application

An Environmental Activity Sector Registration (EASR) is required to be submitted to the Ministry of the Environment, Conservation and Parks (MECP) if the taking of groundwater and stormwater for a temporary construction project is more than 50,000 L/day. The EASR application is an online registry and should be submitted to the MECP before any construction dewatering.

Since the expected design dewatering rate for the unsealed excavation is higher than the MECP's daily water-taking limit of 50,000 L/day, an EASR application will be required to be submitted to the MECP for short-term dewatering before starting construction.

4.5.2 Discharge Permits (Construction Dewatering and Permanent Drainage)

A Discharge permit/Batch Discharge will be required from the Region if private water is to be sent to the storm sewer system for Construction Dewatering and Permanent Drainage.

5.0 POTENTIAL IMPACTS

The following are the predicted potential impacts as a result of construction dewatering:

5.1 Local Groundwater Use

The study area is fully serviced by a municipal water supply. Since it is not expected to have any use of groundwater as a source of drinking water within a radius of 500 meters from the development site, there will be no short-term or long-term predicted impacts to private water wells occurring from the proposed dewatering activities.

5.2 Point of Discharge and Groundwater Quality

The analytical results were compared to Table 1- Limits for Sanitary Sewer Discharge, and Table 2 Limits for Storm Sewer Discharge. The reported analytical results indicate that there were no exceedances

against the Storm Sewer Use By-Law as well as no exceedances reported against the Region's Sanitary Sewer-Use By-Law. As per the Region's Sewer Use Bylaw, no dewatering flows are permitted to be discharged to the sanitary sewer system and all dewatering flows (either temporary during construction or permanent following completion of all construction) are to be directed to the storm sewer system. Therefore, water can be discharged to the Niagara's storm sewer without pre-treatment.

5.3 Settlement Due to Dewatering Activities

There are structures and utilities (structures, buildings, sewers, roads, etc.) expected within the predicted zone of influence, which is estimated at 44 meters from the center of the excavation when considering an unsealed excavation. Since the proposed construction is anticipated to be constructed within the till deposits with relatively low conductivity, an effect of settlement due to dewatering would not be expected. However, DS recommends consulting geotechnical consultants for settlement monitoring requirements to access potential settlement due to any dewatering activities at the site during construction.

6.0 MONITORING AND MITIGATION

Based on the findings of the hydrogeological assessment and associated potential impacts due to development, the following monitoring and mitigation program is provided:

- If a groundwater dewatering system is set up at the Site, daily and weekly monitoring should be implemented during construction to assess the groundwater conditions such as water levels, measurement of discharge flow, discharge water quality and any adverse impacts as a result of dewatering including settlement.

- Baseline groundwater quality has been assessed and established before construction. However, groundwater quality can change based on several factors (land-use change, spills, etc.) and should be monitored during construction dewatering and after construction to ensure that water quality meets the guidelines or regulations associated with any permits from the MECP and the City of Toronto.

- Following the completion of construction activities, all dewatering wells, well points, eductors and monitoring wells installed at various stages of this project must be decommissioned. The installation and eventual decommissioning of the wells and the dewatering system must be carried out by a licensed water well contractor in accordance with Regulation 903 of the Ontario Water Resources Act.

Should you have any questions regarding these findings, please contact the undersigned.

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Martin Gedeon, M.Sc., P.Geo.
Vice President, Senior Hydrogeologist

7.0 CONSULTANT QUALIFICATIONS

Martin Gedeon, M.Sc., P.Geo., is a Professional Geoscientist (P.Geo.) with over 28 years of experience as an environmental/hydrogeological consultant in the areas of groundwater and soil monitoring, environmental site assessments, environmental due diligence, and remediation. Martin has significant experience in physical and contaminant hydrogeology across Canada and overseas and has provided hydrogeological/environmental technical support on various projects. Martin has prepared hundreds of hydrogeological reports in support of permit applications for a private sector development application, municipal dewatering operations, and provincial infrastructure projects across the province.

Meysam Jafari, M.Sc., P.Geo., is a Professional Geoscientist (P.Geo.) with DS Consultants Ltd. Meysam holds two master degrees in Engineering Geology and Geology (Soil & Groundwater) and has several years of experience working in the geoscience industry. Meysam has experience with conducting Phase One and Phase Two Environmental Site Assessments, hydrogeological and geotechnical investigations in the Greater Toronto Area (GTA), and has been involved with project management, field assessments, data interpretation and reporting.

8.0 REFERENCES

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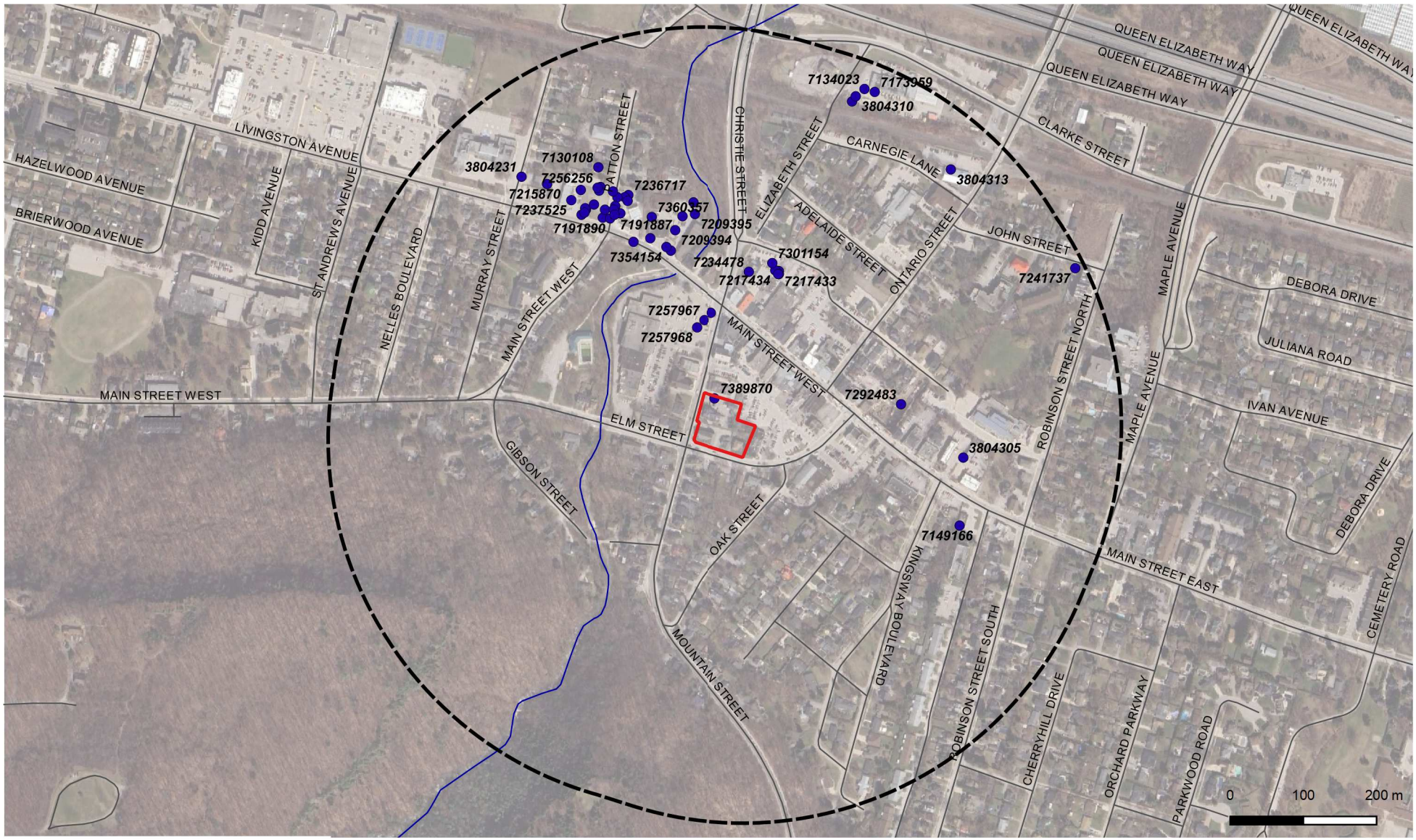
Figures

J:\-GIS\2025 PROJECTS\25-403-100 - 13 Mountain St & 19 Elm St Grimsby, Ontario\1-QGIS\HydroG\Figure 1 – Site Location and MECP Well Records.qgs Dec-11 14:38



Legend

- Site Boundary
- 500m Buffer
- Registered Water Well (MECP WWR)

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Project: HYDROGEOLOGICAL INVESTIGATION
13 Mountain and 19-23 Elm Street, Grimsby, ON

Title: **SITE LOCATION AND MECP WELL RECORDS**

Client: WOOLVERTON HOLDINGS CORP.

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	M.J	S.Y	December 2025
Rev: 0	Scale: As Shown	Project No.: 25-403-100	Figure No.: 1

Image/Map Source: *Google Satellite Image*

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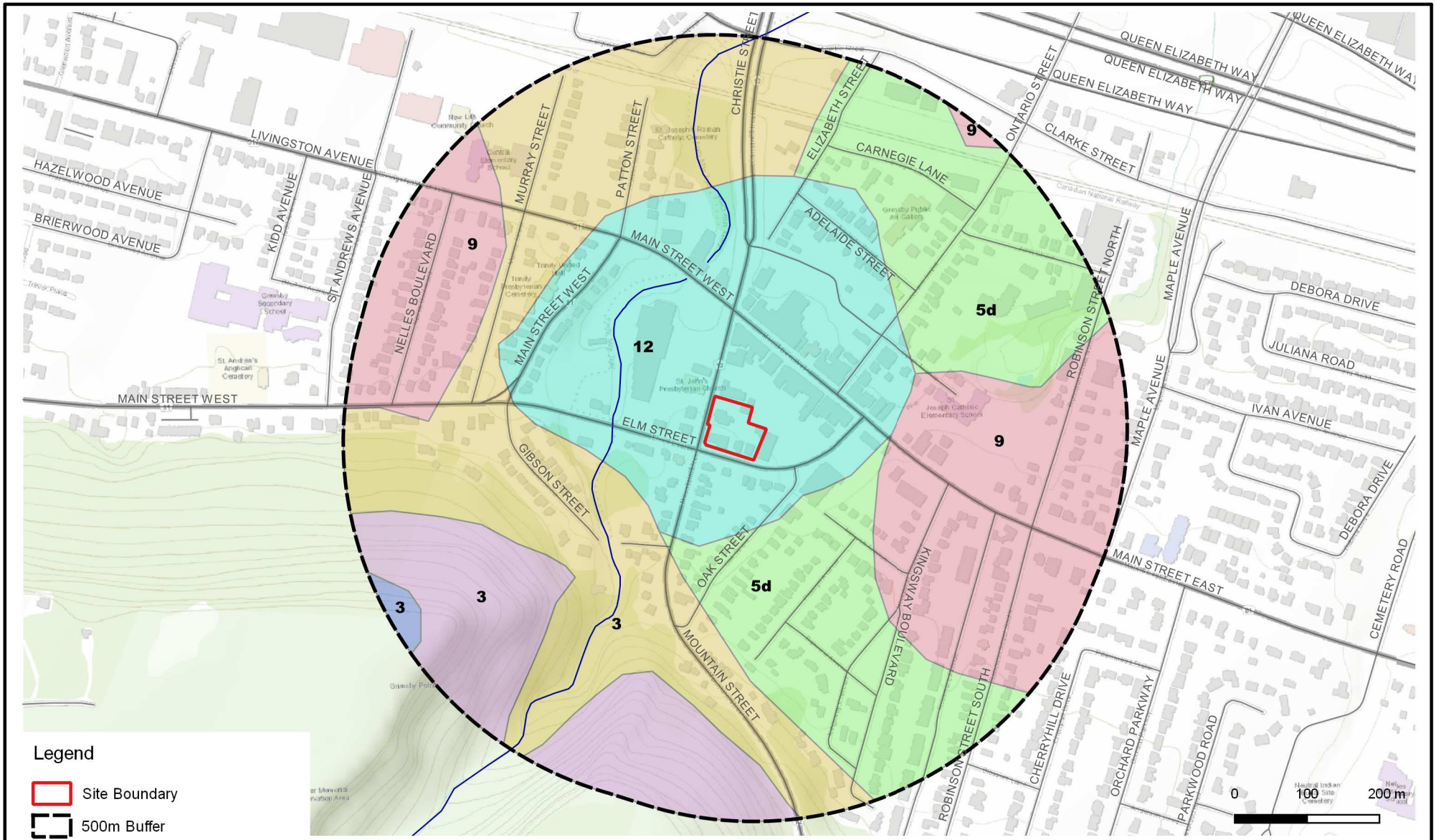

Legend

- Site Boundary
- 500m Buffer
- 12 - Alluvial Fan Gravel Lake Iroquois Deposits
- 3 - Clinton And Cataract Groups
- 3 - Lockport Formation
- 3 - Queenston Formation
- 5d - Till
- 9 - Glaciolacustrine Sand

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Project: HYDROGEOLOGICAL INVESTIGATION
13 Mountain and 19-23 Elm Street, Grimsby, ON

Title: **SURFICIAL GEOLOGY MAP**

N

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	M.J	S.Y	December 2025
Rev: 0	Scale: As Shown	Project No.: 25-403-100	Figure No.: 2

Image/Map Source: *Esri Topo Map & https://www.mndm.gov.on.ca/*

J:\-GIS\2025 PROJECTS\25-403-100 - 13 Mountain St & 19 Elm St Grimsby, Ontario\1-QGIS\HydroG\Figure 3 – Borehole and Monitoring Well Locations.qgs Dec-11 17:13

Legend

- Site Boundary
- Borehole
- Monitoring Well
- Borehole by Other
- Monitoring Well by Other
- Cross Section

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Project: HYDROGEOLOGICAL INVESTIGATION
13 Mountain and 19-23 Elm Street, Grimsby, ON

Title: **BOREHOLE AND MONITORING WELL LOCATIONS**

N

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	M.J	S.Y	December 2025
Rev: 0	Scale: As Shown	Project No.: 25-403-100	Figure No.: 3

Image/Map Source: *Google Satellite Image*

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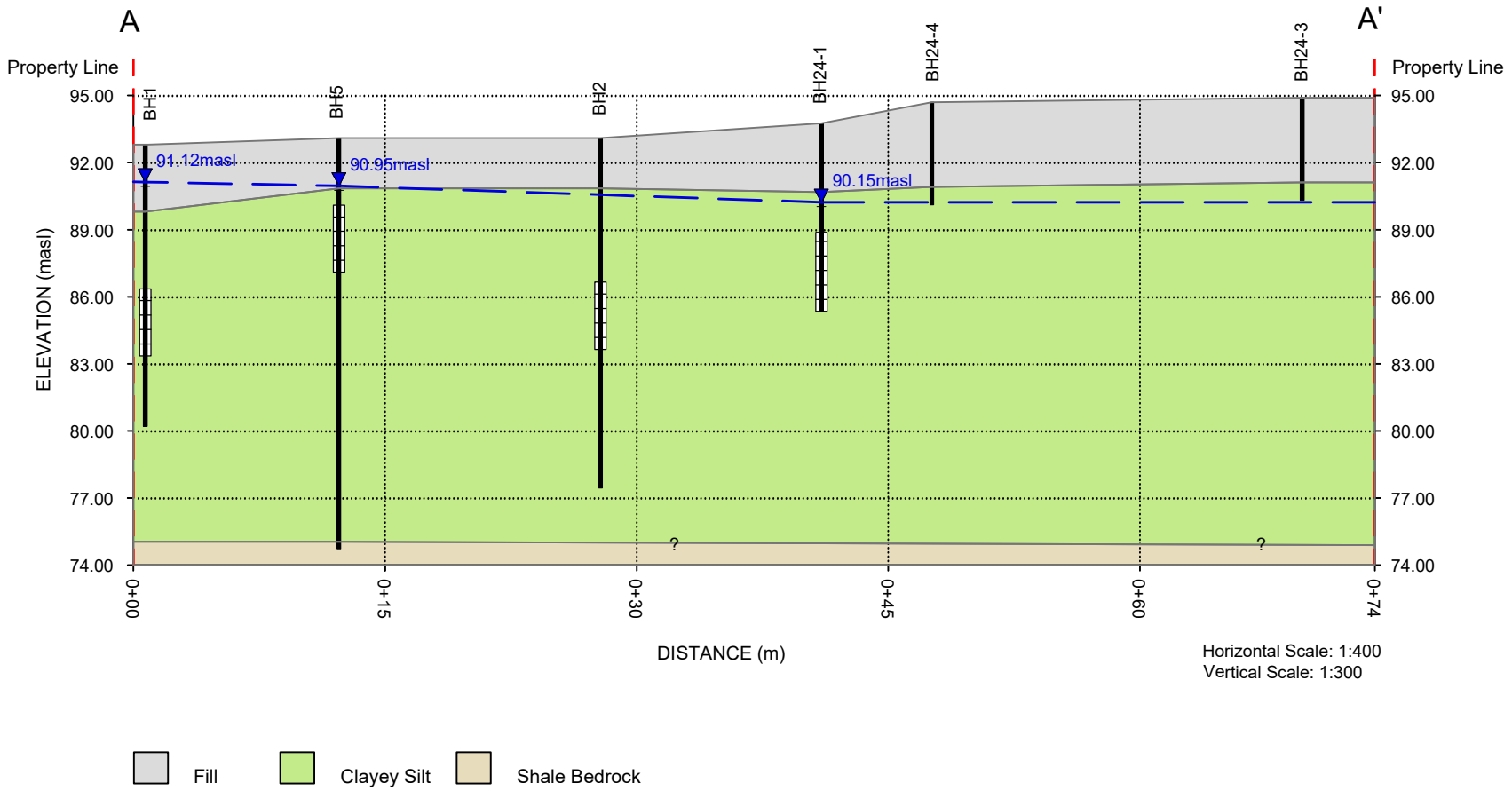

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Project: HYDROGEOLOGICAL INVESTIGATION
13 Mountain and 19-23 Elm Street, Grimsby, ON

Title: **GEOLOGICAL CROSS SECTION A-A'**

Client:	Size:	Approved By:	Drawn By:	Date:
WOOLVERTON HOLDINGS CORP.	8.5 x 11	M.J	S.Y	December 2025
	Rev.	Scale: As Shown	Project No: 25-403-100	Figure No. 4

Appendices

Appendix A: Borehole Logs

LOG OF BOREHOLE 1

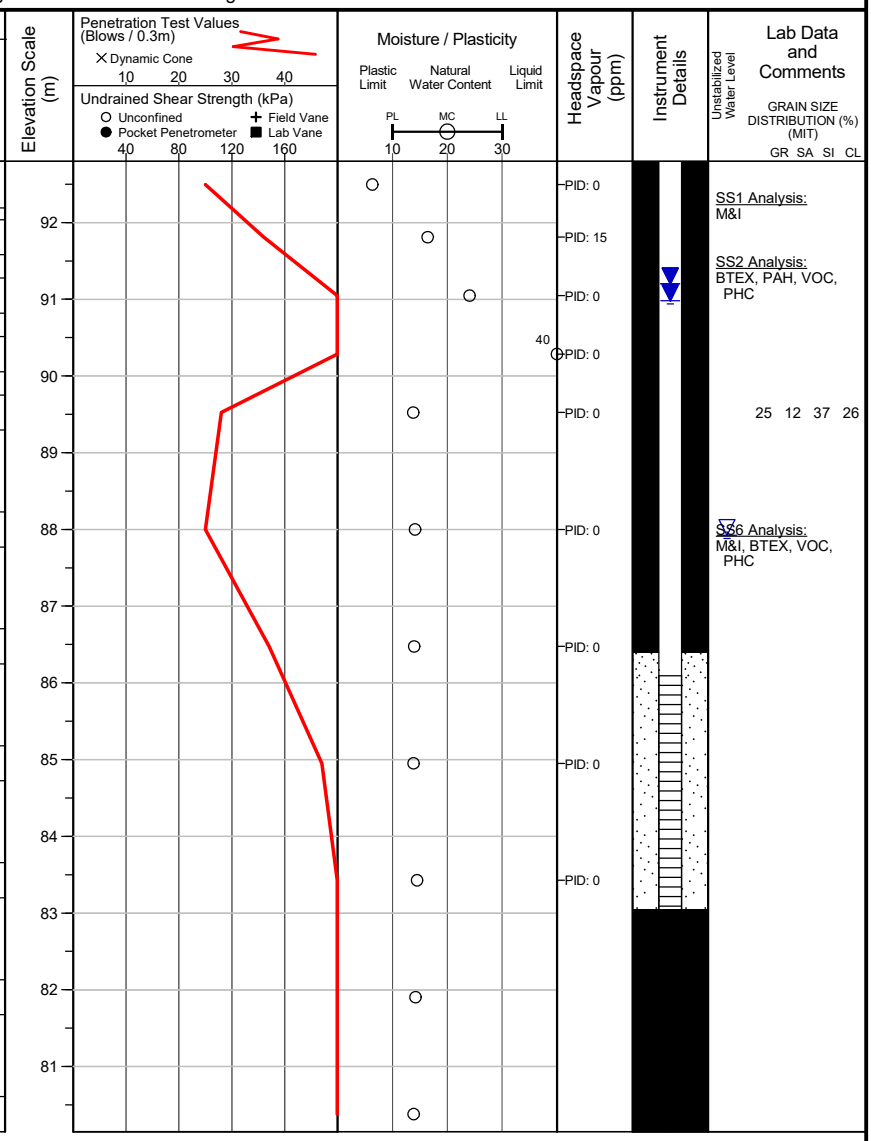
Terraprobe

Project No. : 7-18-0051-42	Client : Valentine Coleman 1 Inc. & Valentine Coleman 2 Inc.	Originated by : JM
Date started : March 25, 2021	Project : 13 Mountain Street and 19 Elm Street	Compiled by : TW
Sheet No. : 1 of 1	Location : Grimsby, Ontario	Checked by : TW

Position : E: 616797, N: 4783259 (UTM 17T) Elevation Datum : Geodetic

Rig type : Mini Mole, track-mounted Drilling Method : Solid stem augers

Depth (m)	Elev Depth (m)	Description	Graphic Log	Number	Type	SPT 'N' Value
0	92.8	**GROUND SURFACE**				
		40mm **ASPHALTIC CONCRETE**		1	SS	25
		FILL, granular base, (150mm)				
1		**FILL**, sand and gravel, with silt, clay, compact to very dense, brown		2	SS	36
2	90.5			3	SS	53
	2.3	**FILL**, clayey silt, trace to some gravel, sand, very dense, brown		4	SS	52
3	89.8					
	3.0	**CLAYEY SILT with GRAVEL**, some sand, very stiff to hard, grey (GLACIAL TILL)		5	SS	28
4						
5				6	SS	25
6						
				7	SS	37
7						
8		...trace red shale fragments below 7.62m depth		8	SS	47
9						
				9	SS	64
10						
				10	SS	54
11						
12	80.2			11	SS	59
	12.6	**END OF BOREHOLE**				



Unstabilized water level measured at 4.9 m below ground surface; borehole was open upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Mar 31, 2021	1.6	91.2
Apr 19, 2021	1.6	91.2
Apr 27, 2021	1.6	91.2
May 3, 2021	1.6	91.2
May 6, 2021	1.6	91.2
May 19, 2021	1.8	91.0

file: 7-18-0051-42 - elm st.gpj

LOG OF BOREHOLE 2

Terraprobe

Project No. : 7-18-0051-42	Client : Valentine Coleman 1 Inc. & Valentine Coleman 2 Inc.	Originated by : JM
Date started : March 23, 2021	Project : 13 Mountain Street and 19 Elm Street	Compiled by : TW
Sheet No. : 1 of 1	Location : Grimsby, Ontario	Checked by : TW

Position : E: 616821, N: 4783229 (UTM 17T) Elevation Datum : Geodetic

Rig type : Mini Mole, track-mounted Drilling Method : Solid stem augers

Depth (m)	Elev Depth (m)	Description	Number	Type	SPT 'N' Value
0	93.1	**GROUND SURFACE**			
		55mm **ASPHALTIC CONCRETE**	1	SS	26
1		**FILL**, sand and gravel, some silt, clay, compact, brown	2	SS	20
2	90.8		3	SS	17
	2.3	**CLAYEY SILT with GRAVEL**, some sand, very stiff to hard, brown to grey (GLACIAL TILL)	4	SS	22
3		...becoming grey at 2.74m depth	5	SS	22
4					
5			6	SS	20
6			7	SS	50 / 150mm
7					
8			8	SS	27
9			9	SS	38
10					
11			10	SS	57
12			11	SS	59
13					
14			12	SS	50
15					
	77.4		13	SS	57
	15.7	**END OF BOREHOLE**			

Penetration Test Values (Blows / 0.3m) — Dynamic Cone (10, 20, 30, 40)

Undrained Shear Strength (kPa) — Unconfined, Pocket Penetrometer, Field Vane, Lab Vane (40, 80, 120, 160)

Moisture / Plasticity — Plastic Limit (PL), Natural Water Content (MC), Liquid Limit (LL) (10, 20, 30)

Headspace Vapour (ppm): PID: 0 / PID: 0 / PID: 0 / PID: 0 / PID: 5 / PID: 5 / PID: 5 / PID: 0 / PID: 0 / PID: 0 / PID: 0

Instrument Details

Unstabilized Water Level

Lab Data and Comments

GRAIN SIZE DISTRIBUTION (%) (MIT) — GR SA SI CL

SS2 Analysis: M&I, PAH

SS3 Analysis: BTEX, VOC, PHC

SS6 Analysis: BTEX, VOC, PHC

23 14 39 24

Borehole was dry and open upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Mar 31, 2021	dry	n/a
Apr 19, 2021	8.6	84.5
Apr 27, 2021	8.0	85.1
May 3, 2021	7.3	85.8
May 6, 2021	8.7	84.4
May 19, 2021	7.9	85.2

file: 7-18-0051-42 - elm st.gpj

LOG OF BOREHOLE 3

Terraprobe

Project No. : 7-18-0051-42	Client : Valentine Coleman 1 Inc. & Valentine Coleman 2 Inc.	Originated by : JM
Date started : March 26, 2021	Project : 13 Mountain Street and 19 Elm Street	Compiled by : TW
Sheet No. : 1 of 1	Location : Grimsby, Ontario	Checked by : TW

Position : E: 616798, N: 4783200 (UTM 17T) Elevation Datum : Geodetic

Rig type : Mini Mole, track-mounted Drilling Method : Solid stem augers

Depth Scale (m)	Elev Depth (m)	Description	Graphic Log	Number	Type	SPT 'N' Value	Elevation Scale (m)
0	95.0	**GROUND SURFACE**					95
		50mm **ASPHALTIC CONCRETE**		1	SS	18	
		FILL, granular base, (50mm)					
1		**FILL**, sand and gravel, trace to some silt, clay, trace brick fragments, compact, brown		2	SS	12	94
2				3	SS	11	93
3				4	SS	38	92
				5	SS	11	
4	91.0			6	SS	24	91
	4.0	**CLAYEY SILT with GRAVEL**, some sand, very stiff to hard, grey (GLACIAL TILL)		7	SS	30	
5							90
6				8	SS	30	89
7							88
8				9	SS	44	87
9		...trace shale fragments below 9.14m depth		10	SS	42	86
10							85
11				11	SS	61	84
12	82.4			12	SS	62	83
	12.6	**END OF BOREHOLE**					

Penetration Test Values (Blows / 0.3m) — Dynamic Cone: 10, 20, 30, 40

Undrained Shear Strength (kPa) — Unconfined, Pocket Penetrometer, Field Vane, Lab Vane: 40, 80, 120, 160

Moisture / Plasticity — Plastic Limit (PL), Natural Water Content (MC), Liquid Limit (LL): 10, 20, 30

Headspace Vapour (ppm)	Lab Data and Comments
PID: 0	
PID: 0	SS2 Analysis: M&I
PID: 0	
PID: 0	
PID: 0	
PID: 5	
PID: 0	
PID: 0	15 16 42 27
PID: 0	

Borehole was dry and open upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Mar 31, 2021	dry	n/a
Apr 19, 2021	9.2	85.8
Apr 27, 2021	8.6	86.4
May 3, 2021	8.3	86.7
May 6, 2021	9.2	85.8
May 19, 2021	8.3	86.7

file: 7-18-0051-42 - elm st.gpj

LOG OF BOREHOLE 4

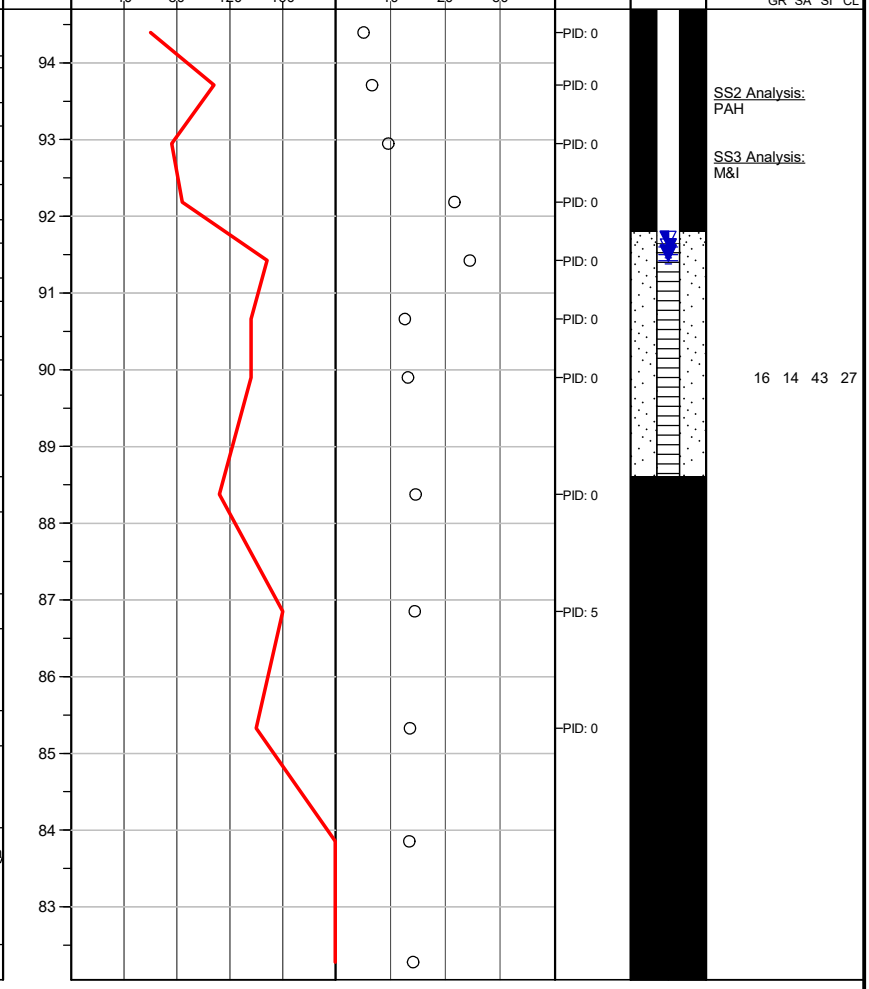
Terraprobe

Project No. : 7-18-0051-42	Client : Valentine Coleman 1 Inc. & Valentine Coleman 2 Inc.	Originated by : JM
Date started : March 26, 2021	Project : 13 Mountain Street and 19 Elm Street	Compiled by : TW
Sheet No. : 1 of 1	Location : Grimsby, Ontario	Checked by : TW

Position : E: 616792, N: 4783210 (UTM 17T) Elevation Datum : Geodetic

Rig type : Mini Mole, track-mounted Drilling Method : Solid stem augers

Depth Scale (m)	Elev Depth (m)	Description	Graphic Log	Number	Type	SPT 'N' Value
0	94.7	**GROUND SURFACE**				
	94.3	40mm **ASPHALTIC CONCRETE**		1	SS	15
	0.4	**FILL**, granular base, (360mm)				
1		**FILL**, sand and gravel, trace to some silt, clay, trace brick fragments, compact to dense, brown		2	SS	27
2				3	SS	19
3				4	SS	21
				5	SS	37
	90.9					
4	3.8	**CLAYEY SILT with GRAVEL**, some sand, very stiff to hard, grey (GLACIAL TILL)		6	SS	34
5				7	SS	34
6				8	SS	28
7						
8				9	SS	40
9						
10				10	SS	35
11				11	SS	72 / 200mm
12						
	82.1			12	SS	55
	12.6					



Headspace Vapour (ppm)
PID: 0
PID: 0
PID: 0
PID: 0
PID: 0
PID: 0
PID: 0
PID: 5
PID: 0

Unstabilized Water Level

Lab Data and Comments

GRAIN SIZE DISTRIBUTION (%) (MIT)

GR SA SI CL

SS2 Analysis: PAH

SS3 Analysis: M&I

16 14 43 27

END OF BOREHOLE

Borehole was dry and open upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Mar 31, 2021	3.1	91.6
Apr 19, 2021	3.2	91.5
Apr 27, 2021	3.2	91.5
May 3, 2021	3.2	91.5
May 6, 2021	3.2	91.5
May 19, 2021	3.3	91.4

file: 7-18-0051-42 - elm st.gpj

LOG OF BOREHOLE 5

Terraprobe

Project No. : 7-18-0051-42	Client : Valentine Coleman 1 Inc. & Valentine Coleman 2 Inc.	Originated by : JM
Date started : March 24, 2021	Project : 13 Mountain Street and 19 Elm Street	Compiled by : TW
Sheet No. : 1 of 1	Location : Grimsby, Ontario	Checked by : TW

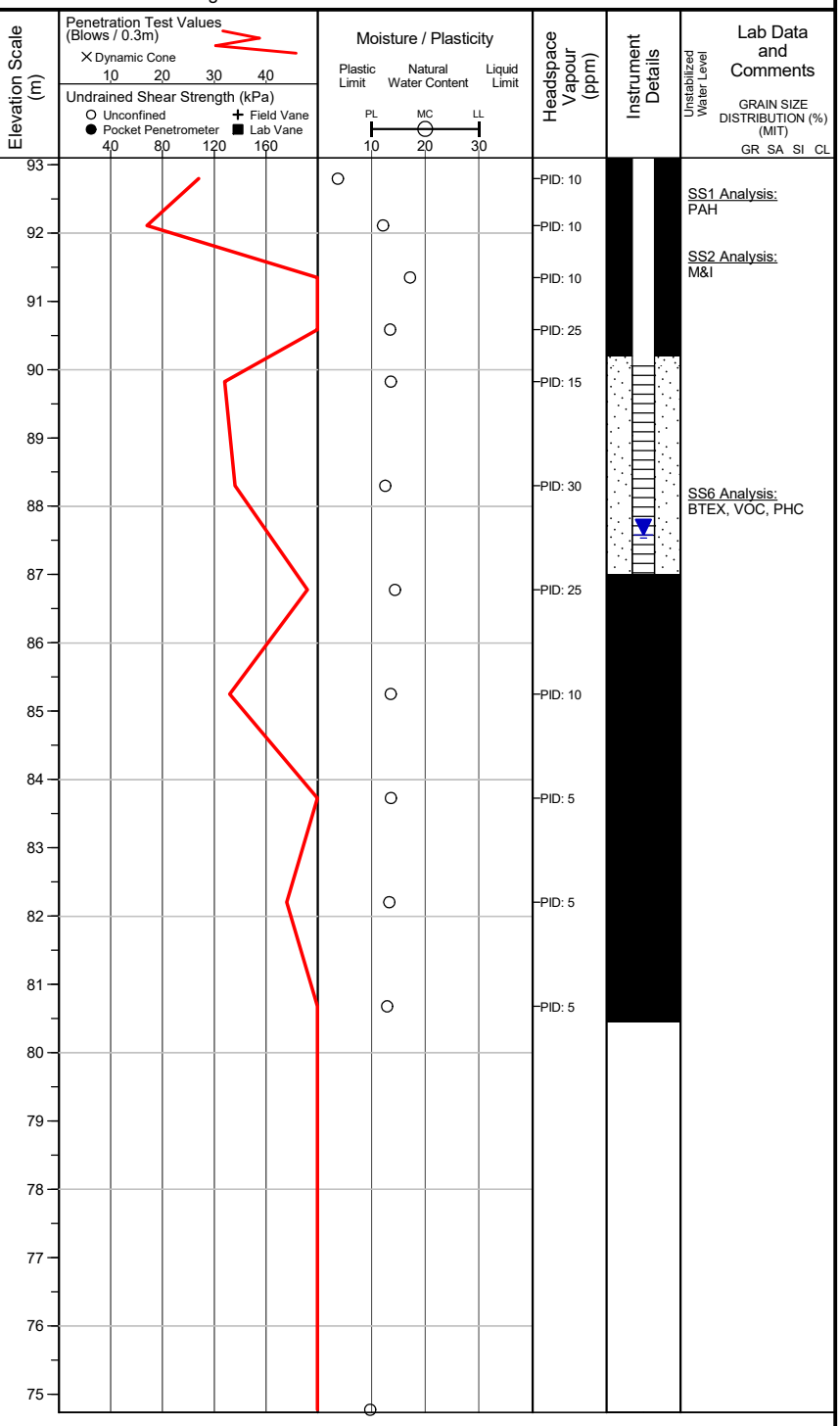
Position : E: 616804, N: 4783243 (UTM 17T) Elevation Datum : Geodetic

Rig type : Mini Mole, track-mounted Drilling Method : Solid stem augers

Depth Scale (m)	Elev Depth (m)	Description	Graphic Log	Number	Type	SPT 'N' Value
0	93.1	**GROUND SURFACE**				
		25mm **ASPHALTIC CONCRETE**		1	SS	27
		FILL, granular base, (225mm)				
1		**FILL**, clayey silt, some sand, gravel, compact to very dense, brown		2	SS	17
				3	SS	61
2	90.8					
	2.3	**CLAYEY SILT with GRAVEL**, some sand, hard, brown (GLACIAL TILL)		4	SS	63
3		...becoming grey below 2.44m depth		5	SS	32
4						
				6	SS	34
5						
6				7	SS	48
7						
				8	SS	33
8						
9		...red shale fragments below 9.14m depth		9	SS	60
10						
				10	SS	44
11						
12		...straight-drilled beyond 12.19m depth		11	SS	51
13						
14						
15						
16						
17						
18	74.8					
	74.7			12	SS	50 / 75mm
	18.4	**WEATHERED SHALE**, hard, reddish brown (QUEENSTON FORMATION)				
		END OF BOREHOLE				

Borehole was dry and open upon completion of drilling.

50 mm dia. monitoring well installed.



WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Mar 31, 2021	dry	n/a
Apr 19, 2021	dry	n/a
Apr 27, 2021	6.2	86.9
May 3, 2021	6.0	87.1
May 6, 2021	5.9	87.2
May 19, 2021	5.5	87.6

file: 7-18-0051-42 - elm st.gpj

LOG OF BOREHOLE 6

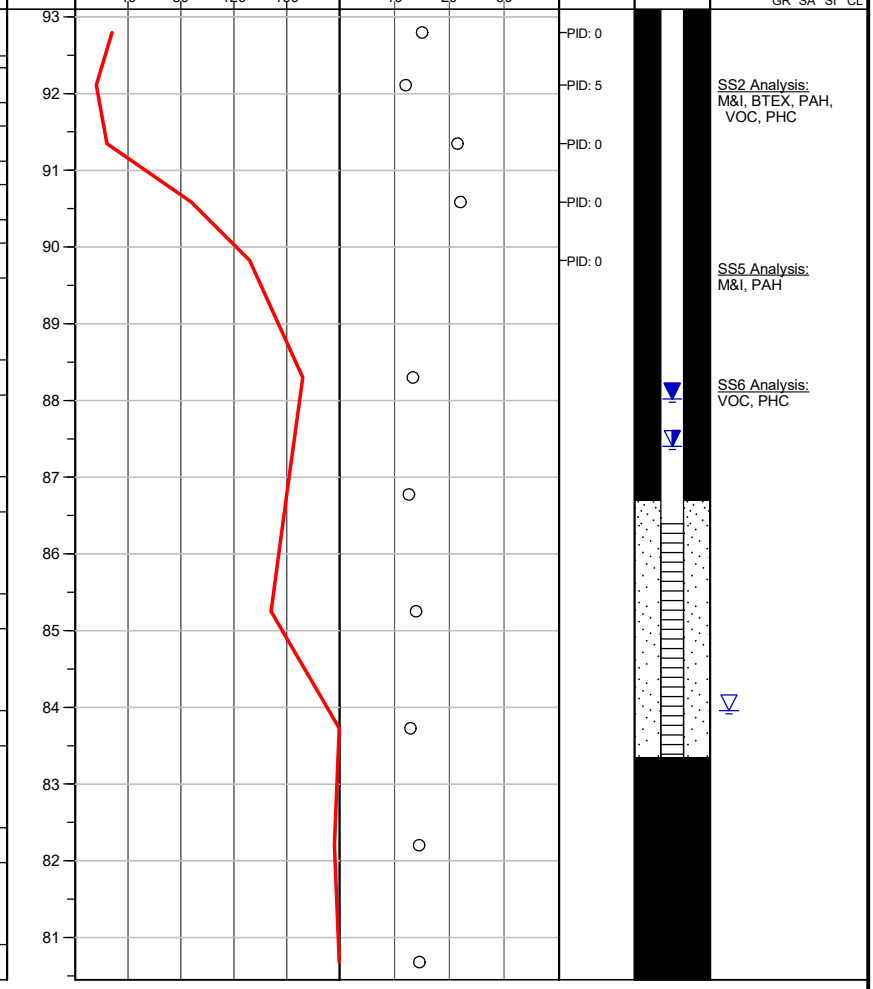
Terraprobe

Project No. : 7-18-0051-42	Client : Valentine Coleman 1 Inc. & Valentine Coleman 2 Inc.	Originated by : JM
Date started : March 25, 2021	Project : 13 Mountain Street and 19 Elm Street	Compiled by : TW
Sheet No. : 1 of 1	Location : Grimsby, Ontario	Checked by : TW

Position : E: 616819, N: 4783255 (UTM 17T) Elevation Datum : Geodetic

Rig type : Mini Mole, track-mounted Drilling Method : Solid stem augers

Depth Scale (m)	Elev Depth (m)	Description	Graphic Log	Number	Type	SPT 'N' Value
0	93.1	**GROUND SURFACE**				
	92.5	**FILL**, gravel, (100mm pea gravel)		1	SS	7
	0.6	**FILL**, silty sand and granular				
1		**FILL**, sandy silt to clayey silt, trace gravel, loose to compact, brown		2	SS	4
2	90.8			3	SS	6
	2.3	**CLAYEY SILT and GRAVEL**, some sand, hard, brown (GLACIAL TILL) ...becoming grey below 3.05m depth		4	SS	22
3				5	SS	33
4						
5				6	SS	43
6						
				7	SS	40
7						
8				8	SS	37
9						
				9	SS	54
10						
11				10	SS	49
12	80.5					
	12.6	**END OF BOREHOLE**		11	SS	54



Unstabilized water level measured at 9.1 m below ground surface; borehole was open upon completion of drilling.

50 mm dia. monitoring well installed.

WATER LEVEL READINGS

Date	Water Depth (m)	Elevation (m)
Mar 31, 2021	dry	n/a
Apr 19, 2021	5.7	87.4
Apr 27, 2021	5.4	87.7
May 3, 2021	5.2	87.9
May 6, 2021	5.1	88.0
May 19, 2021	5.1	88.0

file: 7-18-0051-42 - elm st.gpj

LOG OF BOREHOLE 7

Terraprobe

Project No. : 7-18-0051-42	Client : Valentine Coleman 1 Inc. & Valentine Coleman 2 Inc.	Originated by : JM
Date started : March 31, 2021	Project : 13 Mountain Street and 19 Elm Street	Compiled by : TW
Sheet No. : 1 of 1	Location : Grimsby, Ontario	Checked by : TW

Position : E: 616806, N: 4783217 (UTM 17T) Elevation Datum : Geodetic

Rig type : Mini Mole, track-mounted Drilling Method : Solid stem augers

Depth Scale (m)	Elev Depth (m)	Description	Graphic Log	Number	Type	SPT 'N' Value	Elevation Scale (m)
	93.5	**GROUND SURFACE**					
0		50mm **ASPHALTIC CONCRETE**		1	SS	14	93
1		**FILL**, granular with sandy silt, trace to some clay, compact to dense, brown		2	SS	41	92
2	91.2			3	SS	18	
	2.3	**CLAYEY SILT and GRAVEL**, some sand, very stiff to hard, brown (GLACIAL TILL)		4	SS	34	91
3		...becoming grey below 2.59m depth		5	SS	23	90
4							
5				6	SS	32	89
6							88
				7	SS	31	87
7							
8		...trace shale fragments below 7.62m depth		8	SS	37	86
9							85
				9	SS	40	84
10							
11				10	SS	39	83
							82
12							
	80.9			11	SS	44	81
	12.6	**END OF BOREHOLE**					

Borehole was dry and open upon completion of drilling.

Penetration Test Values (Blows / 0.3m)
Dynamic Cone 10 20 30 40
Undrained Shear Strength (kPa)
Unconfined, Pocket Penetrometer, Field Vane, Lab Vane
40 80 120 160

Moisture / Plasticity
Plastic Limit, Natural Water Content, Liquid Limit
PL MC LL
10 20 30

Headspace Vapour (ppm)

Instrument Details

Unstabilized Water Level

Lab Data and Comments

GRAIN SIZE DISTRIBUTION (%) (MIT)
GR SA SI CL

SS1 Analysis:
M&I

SS3 Analysis:
M&I, PAH

file: 7-18-0051-42 - elm st.gpj

LOG OF BOREHOLE 8

Terraprobe

Project No. : 7-18-0051-42	Client : Valentine Coleman 1 Inc. & Valentine Coleman 2 Inc.	Originated by : JM
Date started : March 31, 2021	Project : 13 Mountain Street and 19 Elm Street	Compiled by : TW
Sheet No. : 1 of 1	Location : Grimsby, Ontario	Checked by : TW

Position : E: 616817, N: 4783215 (UTM 17T) Elevation Datum : Geodetic

Rig type : Mini Mole, track-mounted Drilling Method : Solid stem augers

Depth Scale (m)	Elev Depth (m)	Description	Graphic Log	Number	Type	SPT 'N' Value	Elevation Scale (m)	Penetration Test Values (Blows / 0.3m) / Undrained Shear Strength (kPa)	Moisture / Plasticity (PL, MC, LL)	Headspace Vapour (ppm)	Instrument Details	Unstabilized Water Level	Lab Data and Comments
0	**93.5**	**GROUND SURFACE**											
		50mm **ASPHALTIC CONCRETE**											
		FILL, granular base, (150mm)											
		FILL, clayey silt, some gravel, trace sand, loose to compact, brown to dark brown		1	SS	11	93		PL MC LL				SS1 Analysis: M&I, PAH
1				2	SS	23							
				3	SS	9	92						SS3 Analysis: M&I, BTEX, VOC, PHC
	91.5 2.0	**END OF BOREHOLE**											

Penetration Test Values (Blows / 0.3m): × Dynamic Cone; 10 20 30 40

Undrained Shear Strength (kPa): ○ Unconfined ● Pocket Penetrometer + Field Vane ■ Lab Vane; 40 80 120 160

Moisture / Plasticity: Plastic Limit | Natural Water Content | Liquid Limit; PL MC LL; 10 20 30

Lab Data and Comments: GRAIN SIZE DISTRIBUTION (%) (MIT) GR SA SI CL

Borehole was dry and open upon completion of drilling.

file: 7-18-0051-42 - elm st.gpj

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LOG OF BOREHOLE MW24-1

PROJECT:
CLIENT: Valentine Coleman 1 Inc. and Valentine Coleman 2 Inc.
PROJECT LOCATION: 21 and 23 Elm Street, Grimsby, Ontario
DATUM: Geodetic
BH LOCATION: N 4783217.26 E 616832.562

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150 mm
Date: Nov/22/2024 to Nov/22/2024

REF. NO.: 24-330-100
ENCL NO.:

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS "N" 0.3 m	GROUND WATER CONDITIONS	ELEVATION	Soil Head Space Vapors PID (ppm)	Soil Head Space Vapors CGD (ppm)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT (w_P w w_L) WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
93.7								10 20 30 40	10 20 30 40	10 20 30			
93.7 / 0.0	**ASPHALT:** granular base (150mm)												
	FILL: clayey silt, some gravel, brown, dry to moist		1	SS			93						
1			2	SS									PHCs, BTEXs & VOCs
			3	SS			92						
2	...red shale fragements		4	SS									Metals and ORPs, PAHs
90.7 / 3.1	**CLAYEY SILT WITH GRAVEL:** trace tree root, brown, moist		5	SS			91						
4			6	SS			90						
			7	SS			89						
5			8	SS			88						
6			9	SS									PHCs, BTEXs & VOCs
			10	SS			87						
7			11	SS			86						
85.4 / 8.4	**END OF BOREHOLE:**												

Water Level Readings
November 26, 2024 Dry
Decemeber 6, 2024 Dry

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: +3, ×3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH24-2

PROJECT:
CLIENT: Valentine Coleman 1 Inc. and Valentine Coleman 2 Inc.
PROJECT LOCATION: 21 and 23 Elm Street, Grimsby, Ontario
DATUM: Geodetic
BH LOCATION: N 4783182.932 E 616818.19

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150 mm
Date: Nov/22/2024 to Nov/22/2024

REF. NO.: 24-330-100
ENCL NO.:

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	Soil Head Space Vapors: PID (ppm)	Soil Head Space Vapors: CGD (ppm)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT (w_P w w_L) WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
94.7								10 20 30 40	10 20 30 40	10 20 30			
94.6 0.0	**ASPHALT: granular base (150mm)**												
	FILL: clayey silt, red shale fragements, brown, moist		1	SS			94						
1			2	SS									PAHs PHCs, BTEXs
	...trace brick pieces, trace gravel, wood pieces		3	SS			93						Metals and ORPs
2			4	SS			92						
3 91.6													
3.1	**FILL**: sandy silt, yellow to brown, moist		5	SS			91						
90.9													
3.8 4	**CLAYEY SILT WITH GRAVEL** grey, wet		6	SS									
90.1													
4.6	**END OF BOREHOLE:**												

DS ENVIRO 0-50 PPM-2021 24-330-100.GPJ DS.GDT 12/16/24

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH24-3

PROJECT:
CLIENT: Valentine Coleman 1 Inc. and Valentine Coleman 2 Inc.
PROJECT LOCATION: 21 and 23 Elm Street, Grimsby, Ontario
DATUM: Geodetic
BH LOCATION: N 4783186.933 E 616804.05

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150 mm
Date: Nov/22/2024 to Nov/22/2024

REF. NO.: 24-330-100
ENCL NO.:

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION	Soil Head Space Vapors: PID (ppm)	Soil Head Space Vapors: CGD (ppm)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT; WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
94.9													
94.8 0.0	**ASPHALT:** granular base (150 mm)												
	FILL: sand and gravel, some clay, brown, moist		1	SS									
1			2	SS			94						Metals and ORPs, PAHs PHCs, BTEXs
2			3	SS			93						
	...limestone fragments, some sand, trace silt, moist		4	SS									
3	...sandy silt, yellow to brown, moist		5	SS			92						
91.1													
3.8 4	**CLAYEY SILT WITH GRAVEL:** brown, moist		6	SS			91						Metals and ORPs
90.3													
4.6	**END OF BOREHOLE:**												

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH24-4

PROJECT:
CLIENT: Valentine Coleman 1 Inc. and Valentine Coleman 2 Inc.
PROJECT LOCATION: 21 and 23 Elm Street, Grimsby, Ontario
DATUM: Geodetic
BH LOCATION: N 4783209 E 616809.947

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150 mm
Date: Nov/22/2024 to Nov/22/2024

REF. NO.: 24-330-100
ENCL NO.:

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	Soil Head Space Vapors PID (ppm) 10 20 30 40	Soil Head Space Vapors CGD (ppm) 10 20 30 40	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
94.7													
94.7 / 0.0	**ASPHALT:** granular base (150mm)												
	FILL: silt clay, some sand trace wood pieces, black to brown, moist		1	SS									
			2	SS			94						PHCs, BTEXs
1	...brick pieces, wood pieces, red shale fragments		3	SS			93						Metals and ORPs, PAHs
2			4	SS			92						
3	...some sand, some gravel		5	SS			91						
90.9													
3.8 / 4	**CLAYEY SILT WITH GRAVEL:** grey, moist to wet		6	SS									Metals and ORPs
90.1													
4.6	**END OF BOREHOLE:**												

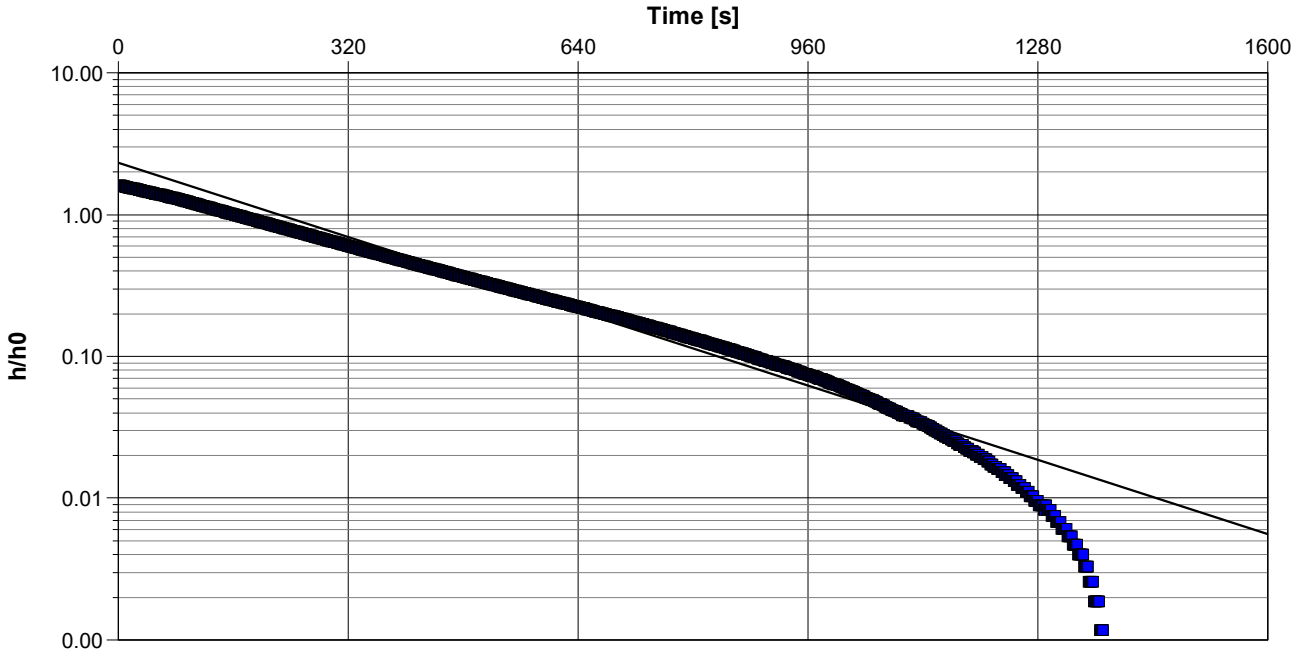
GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

Appendix B: Hydraulic Conductivity Analysis

	Slug Test Analysis Report
	Project: Hydrogeological Investigation
	Number: 25-403-100
	Client: Woolverton Holdings Corp

Location: 13 Mountain St & 19-23 Elm St	Slug Test: BH1	Test Well: BH1
Test Conducted by: CL		Test Date: 11/26/2025
Analysis Performed by: MJ	Hvorslev	Analysis Date: 11/28/2025
Aquifer Thickness:		

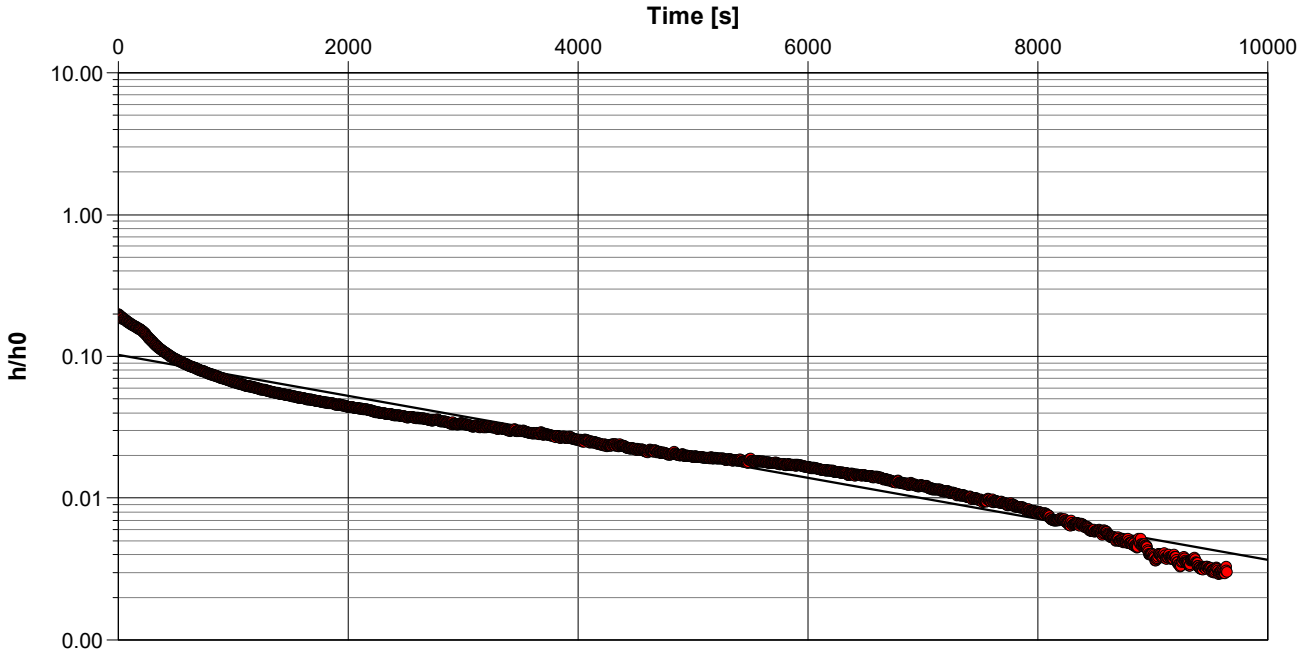


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH1	1.65×10^{-6}	

Slug Test Analysis Report	
Project: Hydrogeological Investigation	
Number: 25-403-100	
Client: Woolverton Holdings Corp	

Location: 13 Mountain St & 19-23 Elm St	Slug Test: BH3	Test Well: BH3
Test Conducted by: CL		Test Date: 11/26/2025
Analysis Performed by: MJ	Hvorslev	Analysis Date: 11/28/2025
Aquifer Thickness:		

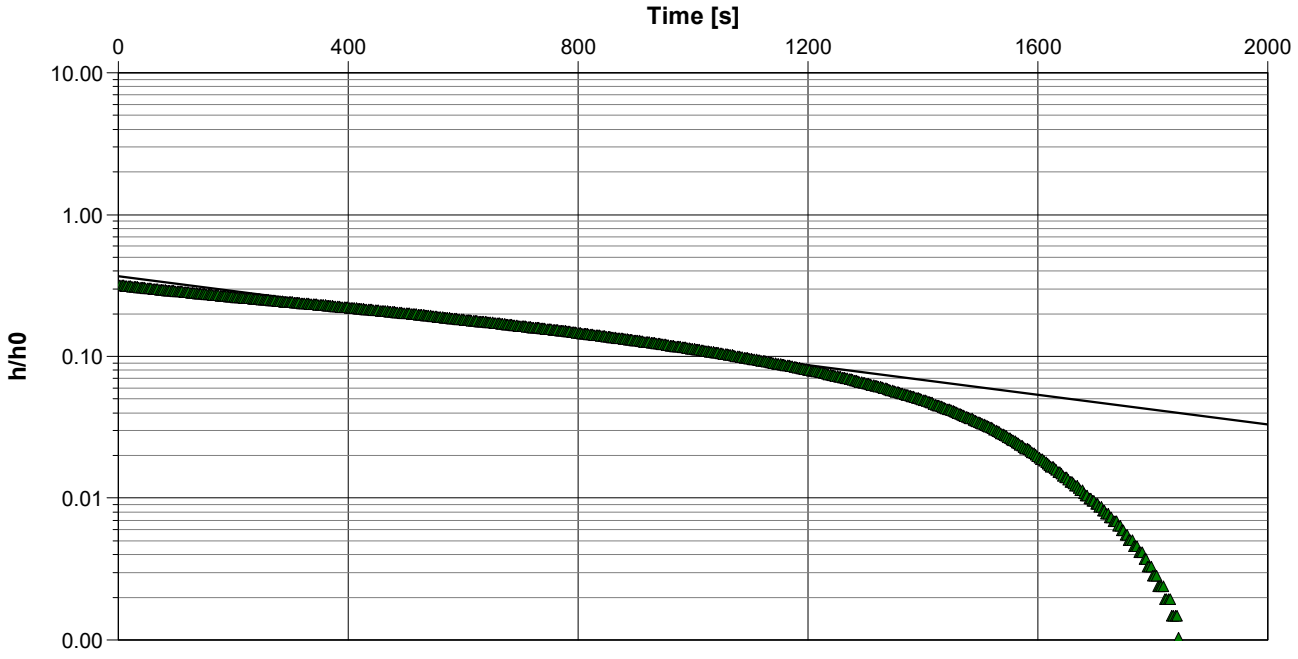


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH3	1.46×10^{-7}	

	Slug Test Analysis Report
	Project: Hydrogeological Investigation
	Number: 25-403-100
	Client: Woolverton Holdings Corp

Location: 13 Mountain St & 19-23 Elm St	Slug Test: BH4	Test Well: BH4
Test Conducted by: CL		Test Date: 11/26/2025
Analysis Performed by: MJ	Hvorslev	Analysis Date: 11/28/2025
Aquifer Thickness:		

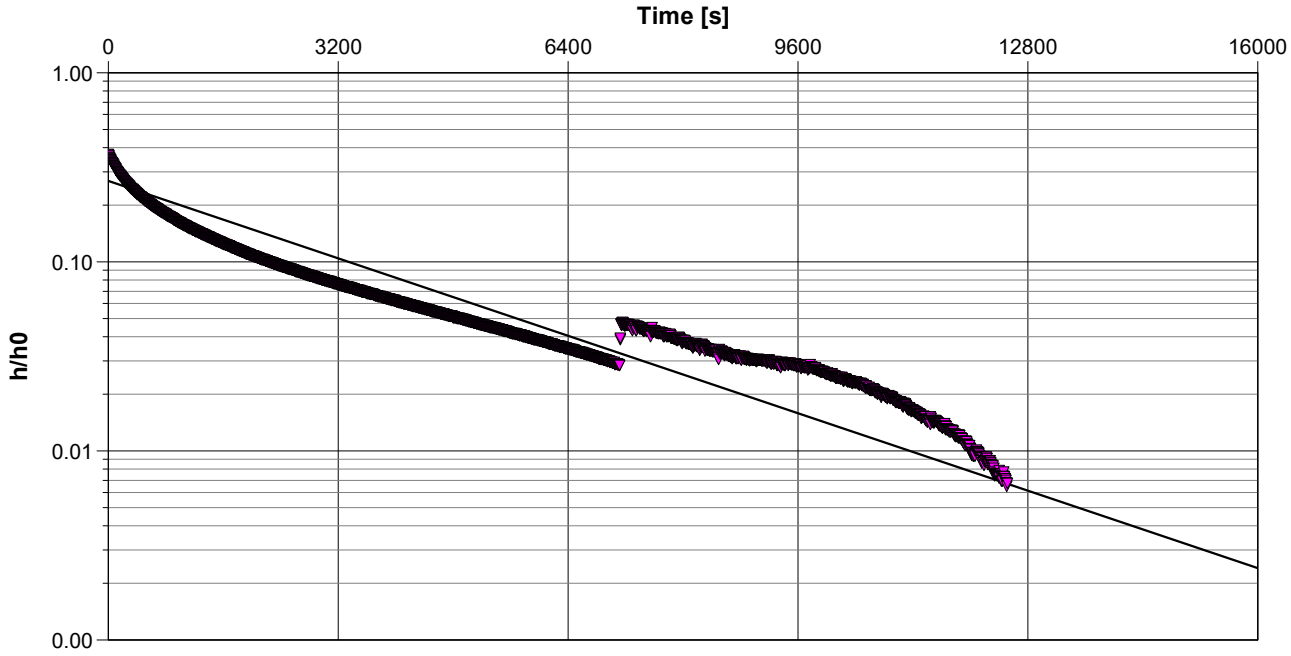


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH4	5.28×10^{-7}	

Slug Test Analysis Report	
Project: Hydrogeological Investigation	
Number: 25-403-100	
Client: Woolverton Holdings Corp	

Location: 13 Mountain St & 19-23 Elm St	Slug Test: BH5	Test Well: BH5
Test Conducted by: CL		Test Date: 11/26/2025
Analysis Performed by: MJ	Hvorslev	Analysis Date: 11/28/2025
Aquifer Thickness:		

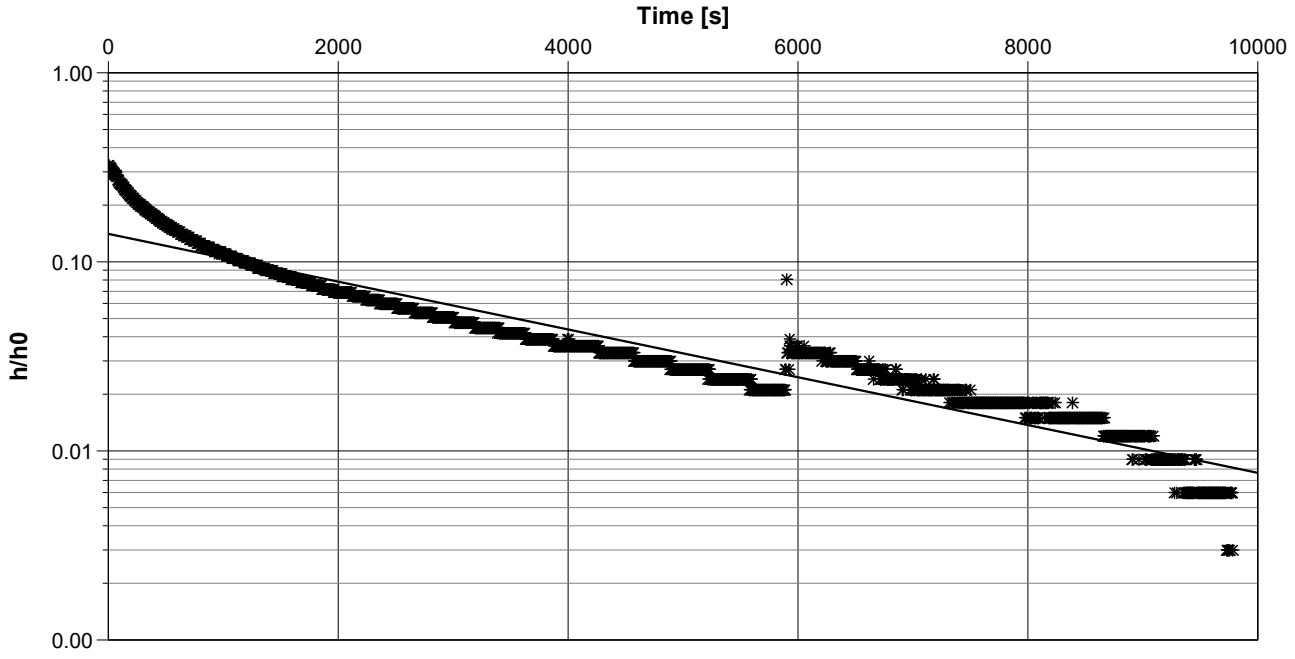


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH5	1.29×10^{-7}	

Slug Test Analysis Report	
Project: Hydrogeological Investigation	
Number: 25-403-100	
Client: Woolverton Holdings Corp	

Location: 13 Mountain St & 19-23 Elm St	Slug Test: BH24-1	Test Well: BH24-1
Test Conducted by: CL		Test Date: 11/26/2025
Analysis Performed by: MJ	Hvorslev	Analysis Date: 11/28/2025
Aquifer Thickness:		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [m/s]	
BH24-1	1.44×10^{-7}	

Appendix C: Groundwater Quality Certificate of Analysis

FINAL REPORT

CA40285-NOV25 R1

25-403-100, 13 Mountain Rd, Grimsby, ON

Prepared for

DS Consultants

FINAL REPORT

CA40285-NOV25 R1

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	DS Consultants	Project Specialist	Jill Campbell, B.Sc.,GISAS
Address	6221 Highway 7 Unit 16 Vaughan, Ontario L4H 0K8, Canada	Laboratory	SGS Canada Inc.
		Address	185 Concession St., Lakefield ON, K0L 2H0
Contact	Meysam Jafari		
Telephone	905-264-9393	Telephone	2165
Facsimile	905-264-2685	Facsimile	705-652-6365
Email	mjafari@dsconsultants.ca	Email	jill.campbell@sgs.com
Works #		SGS Reference	CA40285-NOV25
Project	25-403-100, 13 Mountain Rd, Grimsby, ON	Received	2025-11-26
Reference		Approved	12/02/2025
Batch		Report Number	CA40285-NOV25 R1
Samples	WATER (1)	Date Reported	12/02/2025

COMMENTS

RL - SGS Reporting Limit

Nonylphenol Ethoxylates is the sum of nonylphenol monoethoxylate and nonylphenol diethoxylate.

Total PAH is the sum of anthracene, benzo(a)pyrene, benzo(a)anthracene, benzo(e)pyrene, benzo(b,j)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, dibenzo(a,i)pyrene, dibenzo(a,j)acridine, 7H-dibenzo(c,g)carbazole, fluoranthene, indeno(1,2,3-c,d)pyrene, perylene, phenanthrene and pyrene..

Temperature of Sample upon Receipt: 9 degrees C
Cooling Agent Present:Yes
Custody Seal Present:Yes

Chain of Custody Number:046130

SIGNATORIES

Jill Campbell, B.Sc.,GISAS

TABLE OF CONTENTS

Client: DS Consultants
Project: 25-403-100, 13 Mountain Rd, Grimsby, ON
Project Manager: Meysam Jafari
Samplers: Chaitanya

MATRIX: WATER

L1 = SANSEW / WATER / - - Niagara Sewer Use ByLaw - Sanitary Sewer Discharge - BL_2024_51

L2 = SANSEW / WATER / - - Niagara Sewer Use ByLaw - Storm Sewer Discharge - BL_2024_51

Sample Number	8
Sample Name	BH 1
Sample Matrix	Ground Water
Sample Date	2025-11-26 00:00

Parameter	Units	RL	L1	L2	Result
General Chemistry					
Biochemical Oxygen Demand (BOD5)	mg/L	2	300		< 4 ↑
Total Suspended Solids	mg/L	2	350		94
Total Kjeldahl Nitrogen	as N mg/L	0.5	100		< 0.5
Chemical Oxygen Demand	mg/L	8	600		12
Metals and Inorganics					
Cyanide (total)	mg/L	0.01	1		< 0.01
Fluoride	mg/L	0.06	10		0.16
Sulphide	mg/L	0.02	1		< 0.02
Sulphate	mg/L	2	1500		190
Antimony (total)	mg/L	0.0009	5		< 0.0009
Arsenic (total)	mg/L	0.0002	1		0.0018
Cadmium (total)	mg/L	0.000003	0.7		0.000153
Chromium (total)	mg/L	0.00008	3		0.00481
Cobalt (total)	mg/L	0.000004	5		0.00147
Copper (total)	mg/L	0.001	3		0.006
Lead (total)	mg/L	0.00009	1		0.00348
Molybdenum (total)	mg/L	0.0004	5		0.0017
Nickel (total)	mg/L	0.0001	2		0.0046
Phosphorus (total)	mg/L	0.003	10		0.101
Selenium (total)	mg/L	0.00004	1		0.00029
Silver (total)	mg/L	0.00005	5		0.00007
Tin (total)	mg/L	0.00006	5		0.00114

Client: DS Consultants
Project: 25-403-100, 13 Mountain Rd, Grimsby, ON
Project Manager: Meysam Jafari
Samplers: Chaitanya

MATRIX: WATER

Sample Number	8
Sample Name	BH 1
Sample Matrix	Ground Water
Sample Date	2025-11-26 00:00

L1 = SANSEW / WATER / - - Niagara Sewer Use ByLaw - Sanitary Sewer Discharge - BL_2024_51

L2 = SANSEW / WATER / - - Niagara Sewer Use ByLaw - Storm Sewer Discharge - BL_2024_51

Parameter	Units	RL	L1	L2	Result
Metals and Inorganics (continued)					
Zinc (total)	mg/L	0.002	3		0.026
Microbiology					
Ecoli	mpn/100mL	0		200	0
Oil and Grease					
Oil & Grease (total)	mg/L	2			< 2
Oil & Grease (animal/vegetable)	mg/L	4	150		< 4
Oil & Grease (mineral/synthetic)	mg/L	4	15		< 4
Other (ORP)					
pH	No unit	0.05	11.1	9	7.23
Mercury (total)	mg/L	0.00001	0.01		< 0.00001
PCBs					
Polychlorinated Biphenyls (PCBs) - Total	mg/L	0.0001	0.0001		< 0.0001

Client: DS Consultants
Project: 25-403-100, 13 Mountain Rd, Grimsby, ON
Project Manager: Meysam Jafari
Samplers: Chaitanya

MATRIX: WATER

Sample Number 8
Sample Name BH 1
Sample Matrix Ground Water
Sample Date 2025-11-26 00:00

L1 = SANSEW / WATER / - - Niagara Sewer Use ByLaw - Sanitary Sewer Discharge - BL_2024_51

L2 = SANSEW / WATER / - - Niagara Sewer Use ByLaw - Storm Sewer Discharge - BL_2024_51

Parameter	Units	RL	L1	L2	Result
Phenols					
4AAP-Phenolics	mg/L	0.001	1		0.004
SVOCs					
Bis(2-ethylhexyl)phthalate	mg/L	0.002	0.28		0.002
VOCs					
Chloroform	mg/L	0.0005	0.04		< 0.0005
1,2-Dichlorobenzene	mg/L	0.0005	0.05		< 0.0005
1,4-Dichlorobenzene	mg/L	0.0005	0.08		< 0.0005
Methylene Chloride	mg/L	0.0005	0.21		< 0.0005
1,1,2,2-Tetrachloroethane	mg/L	0.0005	0.04		< 0.0005
Tetrachloroethylene (perchloroethylene)	mg/L	0.0005	0.05		< 0.0005
Trichloroethylene	mg/L	0.0005	0.05		< 0.0005
VOCs - BTEX					
Benzene	mg/L	0.0005	0.01		< 0.0005
Ethylbenzene	mg/L	0.0005	0.16		< 0.0005
Toluene	mg/L	0.0005	0.2		< 0.0005
Xylene (total)	mg/L	0.0005	1.4		< 0.0005
m-p-xylene	mg/L	0.0005			< 0.0005
o-xylene	mg/L	0.0005	0.52		< 0.0005

EXCEEDANCE SUMMARY

No exceedances are present above the regulatory limit(s) indicated

QC SUMMARY

Anions by discrete analyzer

Method: US EPA 375.4 I Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Sulphate	DIO8034-NOV25	mg/L	2	<2	5	20	106	80	120	105	75	125

Biochemical Oxygen Demand

Method: SM 5210 I Internal ref.: ME-CA-IENVIEWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Biochemical Oxygen Demand (BOD5)	BOD0043-NOV25	mg/L	2	< 2	15	30	102	70	130	NV	70	130

Chemical Oxygen Demand

Method: HACH 8000 I Internal ref.: ME-CA-IENVIEWL-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chemical Oxygen Demand	EWL0598-NOV25	mg/L	8	<8	5	20	84	80	120	101	75	125

QC SUMMARY

Cyanide by SFA

Method: SM 4500 I Internal ref.: ME-CA-IENVISFA-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Cyanide (total)	SKA0016-DEC25	mg/L	0.01	<0.01	ND	10	100	90	110	99	75	125

Fluoride by Specific Ion Electrode

Method: SM 4500 I Internal ref.: ME-CA-IENVIEWL-LAK-AN-014

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Fluoride	EWL0607-NOV25	mg/L	0.06	<0.06	9	10	100	90	110	NV	75	125

Mercury by CVAAS

Method: EPA 7471A/SM 3112B I Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0067-NOV25	mg/L	0.00001	< 0.00001	ND	20	108	80	120	106	70	130

QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Silver (total)	EMS0362-NOV25	mg/L	0.00005	<0.00005	ND	20	101	90	110	NV	70	130
Arsenic (total)	EMS0362-NOV25	mg/L	0.0002	<0.0002	1	20	102	90	110	86	70	130
Cadmium (total)	EMS0362-NOV25	mg/L	0.000003	<0.000003	7	20	101	90	110	91	70	130
Cobalt (total)	EMS0362-NOV25	mg/L	0.000004	<0.000004	13	20	101	90	110	92	70	130
Chromium (total)	EMS0362-NOV25	mg/L	0.00008	<0.00008	2	20	103	90	110	96	70	130
Copper (total)	EMS0362-NOV25	mg/L	0.001	<0.001	ND	20	99	90	110	102	70	130
Molybdenum (total)	EMS0362-NOV25	mg/L	0.0004	<0.0004	3	20	103	90	110	100	70	130
Nickel (total)	EMS0362-NOV25	mg/L	0.0001	<0.0001	0	20	98	90	110	90	70	130
Lead (total)	EMS0362-NOV25	mg/L	0.00009	<0.00009	15	20	99	90	110	91	70	130
Phosphorus (total)	EMS0362-NOV25	mg/L	0.003	<0.003	2	20	102	90	110	NV	70	130
Antimony (total)	EMS0362-NOV25	mg/L	0.0009	<0.0005	ND	20	98	90	110	89	70	130
Selenium (total)	EMS0362-NOV25	mg/L	0.00004	<0.00004	8	20	100	90	110	95	70	130
Tin (total)	EMS0362-NOV25	mg/L	0.00006	<0.00006	ND	20	103	90	110	NV	70	130
Zinc (total)	EMS0362-NOV25	mg/L	0.002	<0.002	4	20	102	90	110	127	70	130

QC SUMMARY

Microbiology

Method: SM 9223B | Internal ref.: ME-CA-IENVIMIC-LAK-AN-021

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ecoli	BAC9393-NOV25	mpn/100mL	-	ACCEPTED	ACCEPTED							

Oil & Grease

Method: MOE E3401 | Internal ref.: ME-CA-IENVIGC-LAK-AN-019

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Oil & Grease (total)	GCM0464-NOV25	mg/L	2	<2	NSS	20	101	75	125			

QC SUMMARY

Oil & Grease-AV/MS

Method: MOE E3401/SM 5520F | Internal ref.: ME-CA-[ENV]GC-LAK-AN-019

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Oil & Grease (animal/vegetable)	GCM0464-NOV25	mg/L	4	< 4	NSS	20	NA	70	130			
Oil & Grease (mineral/synthetic)	GCM0464-NOV25	mg/L	4	< 4	NSS	20	NA	70	130			

pH

Method: SM 4500 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0613-NOV25	No unit	0.05	NA	0		100			NA		

Phenols by SFA

Method: SM 5530B-D | Internal ref.: ME-CA-[ENV]SFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0255-NOV25	mg/L	0.001	<0.001	ND	10	111	80	120	97	75	125

QC SUMMARY

Polychlorinated Biphenyls

Method: MOE E3400/EPA 8082A | Internal ref.: ME-CA-[ENV]GC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Polychlorinated Biphenyls (PCBs) - Total	GCM0006-DEC25	mg/L	0.0001	<0.0001	NSS	30	105	60	140	NSS	60	140

Semi-Volatile Organics

Method: EPA 3510C/8270D | Internal ref.: ME-CA-[ENV]GC-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Bis(2-ethylhexyl)phthalate	GCM0461-NOV25	mg/L	0.002	< 0.002	NSS	30	113	50	140	NSS	50	140

Sulphide by SFA

Method: SM 4500 | Internal ref.: ME-CA-[ENV]SFA-LAK-AN-008

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Sulphide	SKA0266-NOV25	mg/L	0.02	<0.02	ND	20	100	80	120	NA	75	125

QC SUMMARY

Suspended Solids

Method: SM 2540D | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Suspended Solids	EWL0609-NOV25	mg/L	2	< 2	9	10	95	90	110	NA		

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-[ENV]SFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0008-DEC25	as N mg/L	0.5	<0.5	ND	10	98	90	110	96	75	125

QC SUMMARY

Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-[ENV]GC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1,1,2,2-Tetrachloroethane	GCM0446-NOV25	mg/L	0.0005	<0.0005	ND	30	91	60	130	97	50	140
1,2-Dichlorobenzene	GCM0446-NOV25	mg/L	0.0005	<0.0005	ND	30	101	60	130	99	50	140
1,4-Dichlorobenzene	GCM0446-NOV25	mg/L	0.0005	<0.0005	ND	30	103	60	130	97	50	140
Benzene	GCM0446-NOV25	mg/L	0.0005	<0.0005	ND	30	104	60	130	100	50	140
Chloroform	GCM0446-NOV25	mg/L	0.0005	<0.0005	ND	30	101	60	130	97	50	140
Ethylbenzene	GCM0446-NOV25	mg/L	0.0005	<0.0005	ND	30	106	60	130	100	50	140
m-p-xylene	GCM0446-NOV25	mg/L	0.0005	<0.0005	ND	30	106	60	130	101	50	140
Methylene Chloride	GCM0446-NOV25	mg/L	0.0005	<0.0005	ND	30	88	60	130	84	50	140
o-xylene	GCM0446-NOV25	mg/L	0.0005	<0.0005	ND	30	105	60	130	102	50	140
Tetrachloroethylene (perchloroethylene)	GCM0446-NOV25	mg/L	0.0005	<0.0005	ND	30	104	60	130	101	50	140
Toluene	GCM0446-NOV25	mg/L	0.0005	<0.0005	ND	30	104	60	130	101	50	140
Trichloroethylene	GCM0446-NOV25	mg/L	0.0005	<0.0005	ND	30	105	60	130	100	50	140

QC SUMMARY

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS	Insufficient sample for analysis.
RL	Reporting Limit.
↑	Reporting limit raised.
↓	Reporting limit lowered.
NA	The sample was not analysed for this analyte
ND	Non Detect

Results relate only to the sample tested.

Data reported represent the sample as submitted to SGS.

Test method information available upon request.

"Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

SGS Canada Inc. statement of conformity decision rule does not consider uncertainty when analytical results are compared to a specified standard or regulation.

-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Industries & Environment - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Fax: 705-652-6365 Web: www.sgs.com/environment
- London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361

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Laboratory Information Section - Lab use only

Received By: Avi Goodman
Received Date: 11/26/25 (mm/dd/yy)
Received Time: 17 : 20 (hr : min)
Received By (signature):
Custody Seal Present: Yes ☑ No ☐
Custody Seal Intact: Yes ☑ No ☐
Cooling Agent Present: Yes ☑ No ☐ Type: ice
Temperature Upon Receipt (°C): 9x3
LAB LIMS #: CA-40285-Nov25 SR

REPORT INFORMATION

Company: DS Consultants Ltd.
Contact: Meysam Jafari
Address: 6221 Hwy 7, Unit 16, Vaughan, ON
Phone: 647-831-5596
Fax:
Email: MJafari@dsconsultants.ca

INVOICE INFORMATION

☑ (same as Report Information)
Company:
Contact: Accounting
Address:
Phone:
Email:

Quotation #:
P.O. #:
Project #: 25-403-100
Site Location/ID: 13 Mountain Rd. Grimsby, ON

TURNAROUND TIME (TAT) REQUIRED

☐ Client Regular TAT ☑ Regular TAT (5-7days)

TAT's are quoted in business days (exclude statutory holidays & weekends). Samples received after 6pm or on weekends: TAT begins next business day

RUSH TAT (Additional Charges May Apply): ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days

PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION

Specify Due Date:

*NOTE: DRINKING (POTABLE) WATER SAMPLES FOR HUMAN CONSUMPTION MUST BE SUBMITTED WITH SGS DRINKING WATER CHAIN OF CUSTODY

REGULATIONS

☐ O.Reg 153/04 ☐ O.Reg 406/19
☐ Table 1 ☐ Res/Park Soil Texture: ☐ Coarse
☐ Table 2 ☐ Ind/Com ☐ Medium/Fine
☐ Table 3 ☐ Agri/Other
☐ Table ____ Appx. ____
Soil Volume ☐ <350m3 ☐ >350m3

Other Regulations:
☐ Reg 347/558 (3 Day min TAT)
☐ PWQO ☐ MMER
☐ CCME ☐ Other:
☐ MISA
☐ ODWS Not Reportable *See note

Sewer By-Law:
☑ Sanitary
☑ Storm
Municipality: Niagara

RECORD OF SITE CONDITION (RSC) ☐ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX	Field Filtered (Y/N)	M&I: Metals & Inorganics (incl CrVI, CN,Hg pH,(B(HWS),EC,SAR-soil) (Cl, Na-water)	M&I: Full Metals Suite (ICP metals plus B(HWS-soil only) Hg, CrVI	M&I: ICP Metals only Sb,As,Ba,Be,B,Cd, Cr,Co,Cu,Pb,Mo,Ni,Se,Ag,Tl,U,V,Zn	SVOC: PAHs only	SVOC: SVOCs all incl PAHs, ABNs, CPs	PCB: PCBs Total ☐ Aroclor ☐	PHC: F1-F4 + BTEX	PHC: F1-F4 only no BTEX	VOC: VOCs all incl BTEX	VOC: BTEX only	Pest: Pesticides Organochlorine or specify other	Other: Niagara Sanitary/Storm sewer use by-law	Other	Other	Other: Sewer Use: Specify pkg:	Other: Water Characterization Pkg General ☐ Extended ☐	SPLP: Specify tests ☐ Metals ☐ VOC ☐ 1,4-Dioxane ☐ OCP ☐ ABN	TCLP: Specify tests ☐ M&I ☐ VOC ☐ PCB ☐ B(a)P ☐ ABN ☐ Ignit.	COMMENTS:
1	BH 1	11/26/25	PM	17	Grw	N												✓							Unfiltered sample
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

Observations/Comments/Special Instructions

Sampled By (NAME): Chaitanya	Signature:	Date: 11/26/25 (mm/dd/yy)	Pink Copy - Client
Relinquished by (NAME): Chaitanya	Signature:	Date: 11/28/25 (mm/dd/yy)	Yellow & White Copy - SGS

Revision #: 1.8
Date of Issue: 06 SEP 2024

Appendix D: MECP Water Wells Records

Hydrogeological Investigation- 13 Mountain Street and 19, 21 & 23 Elm Street, Grimsby, Ontario												
TOWNSHIP C	**UTM**	**E**	**N**	**DATE CNTR**	**CASING**	**WATER**	**PUMP TEST**	**WELL USE**	**SCREEN**	**WELL**	**1**	**FORMATION**
GRIMSBY TOWN	17	616637	4783573	2009-09 7238				TH		7130108	(M04663) A086152	BRWN SAND GRVL 0002 BRWN SILT SAND 0012 GREY CLAY SILT 0015
GRIMSBY TOWN 134	17	616532	4783560	2005-03 7295	1.97	FR 0013		NU	0011 11	3804231	(Z23648) A023402	RED SAND SILT SLTY 0010 BRWN SAND SILT 0011 GREY CLAY SILT SLTY 0022
GRIMSBY TOWN (NORTH	17	616620	4783515	2015-01 7241	2			MT	0005 10	7237521	(Z167446) A161934	BRWN SAND SILT SOFT 0010 BRWN CLAY SAND SOFT 0015
GRIMSBY TOWN (NORTH	17	616567	4783550	2013-11 7464	1.97			NU	0005 10	7215870	(Z167990) A154586	GREY 0001 RED SAND SILT 0009 RED SAND 0014 GREY CLAY SILT 0015
GRIMSBY TOWN (NORTH	17	616885	4783431	2014-02 7241	2			MT	0005 10	7217433	(Z184558) A159281	BLCK FILL LOOS 0001 RED CLAY SILT DNSE 0015
GRIMSBY TOWN (NORTH	17	616880	4783432	2014-02 7241	2			MT	0005 10	7217434	(Z184557) A157884	BLCK FILL LOOS 0002 RED CLAY SILT DNSE 0015
GRIMSBY TOWN (NORTH	17	616885	4783427	2014-02 7241	2			MT	0005 10	7217435	(Z184555) A159282	BLCK FILL LOOS 0002 RED CLAY SILT DNSE 0015
GRIMSBY TOWN (NORTH	17	616884	4783427	2013-12 7464						7225161	(C23341) A154595 P	
GRIMSBY TOWN (NORTH	17	616643	4783504	2014-08 7241	1.75	9		MT		7227835	(Z194975) A	
GRIMSBY TOWN (NORTH	17	616646	4783515	2014-08 7241	1.75	10		MT		7227836	(Z194976) A	
GRIMSBY TOWN (NORTH	17	616769	4783509	2013-09 7320	2	UT 0004		TH	0005 10	7209395	(Z176208) A152530	BRWN SAND GRVL FILL 0004 BRWN SAND GRVL WBRG 0010 GREY SILT GRVL WBRG 0013 GREY SILT GRVL 0015
GRIMSBY TOWN (NORTH	17	616619	4783517	2015-01 7241	2			MT	0005 10	7237520	(Z167444) A161936	BRWN SAND SILT SOFT 0010 BRWN CLAY SAND SOFT 0015
GRIMSBY TOWN (NORTH	17	616653	4783503	2012-10 6607	2.13			TH	0005 5	7191890	(Z147906) A134066	GRVL 0003 SILT SAND 0010
GRIMSBY TOWN (NORTH	17	616614	4783508	2015-01 7241	2.04			MT	0005 10	7237522	(Z167449) A161931	BRWN SAND GRVL SOFT 0011 GREY SILT CLAY SOFT 0015
GRIMSBY TOWN (NORTH	17	616618	4783511	2015-01 7241	2			MT	0005 10	7237523	(Z167448) A161932	BRWN SAND SILT SOFT 0010 BRWN CLAY SAND SOFT 0015
GRIMSBY TOWN (NORTH	17	616600	4783528	2015-01 7241	2.04			MT	0005 10	7237525	(Z167447) A161933	BRWN SAND GRVL SOFT 0010 GREY SILT CLAY SOFT 0015
GRIMSBY TOWN (NORTH	17	616678	4783535	2014-12 7324	1.97	FR 0008		MO	0004 5	7236717	(Z178451) A154693	BRWN SAND SILT FILL 0009

GRIMSBY TOWN (NORTH	17	617016	4783676	2011-07 7295	1.79			MO	0010 10	7173959	(Z128958) A113814	BRWN GRVL SAND PCKD 0002 BRWN SAND STNS DNSE 0008 RED SHLE HARD 0020
GRIMSBY TOWN (NORTH	17	617137	4783176	2005-10 6607	2				0005 10	3804305	(Z38234) A034535	BRWN SAND GRVL FILL 0001 BRWN FSND 0005 BRWN CLAY SILT 0015
GRIMSBY TOWN (NORTH	17	617002	4783680	2009-09 7295	1.79			MO	0020 10	7134023	(Z86942) A090344	---- 0001 FILL 0008 RED SHLE 0030
GRIMSBY TOWN (NORTH	17	616667	4783510	2010-07 6607	2	FR 0009		MO	0004 10	7149431	(M07268) A100971	BRWN SAND GRVL FILL 0006 GREY CLAY SILT DNSE 0014
GRIMSBY TOWN (NORTH	17	616673	4783532	2010-07 6607	2			MO		7149433	(M07270) A	
GRIMSBY TOWN (NORTH	17	616736	4783459	2013-09 7320	2	UT 0013		TH	0010 10	7209393	(Z176220) A152532	BRWN SAND GRVL FILL 0015 BRWN SAND GRVL WBRG 0016 GREY SILT WBRG 0200
GRIMSBY TOWN (NORTH	17	616742	4783487	2013-09 7320	2	UT		TH	0005 10	7209394	(Z176207) A152531	BRWN SAND GRVL FILL 0009 BRWN SAND GRVL FILL 0011 GREY SILT GRVL WBRG 0013 GREY SILT GRVL 0015
GRIMSBY TOWN (NORTH	17	616663	4783532	2012-10 6607	2.13			MO	0005 10	7191884	(Z147908) A134156	GREY GRVL 0003 BRWN SILT SAND 0015
GRIMSBY TOWN (NORTH	17	616660	4783520	2012-10 6607	2.13			MO	0005 10	7191885	(Z147909) A134052	GREY GRVL 0003 BRWN SILT SAND 0015
GRIMSBY TOWN (NORTH	17	616658	4783515	2012-10 6607	2.13			MO	0005 10	7191886	(Z147910) A134123	GREY GRVL 0003 BRWN SILT SAND 0015
GRIMSBY TOWN (NORTH	17	616659	4783508	2012-10 6607	2.13			MO	0005 10	7191887	(Z147911) A134050	GREY GRVL 0003 BRWN SILT SAND 0015
GRIMSBY TOWN (NORTH	17	617290	4783435	2015-05 7464						7241737	(C29668) A184239 P	
GRIMSBY TOWN (NORTH	17	616657	4783540	2012-10 6607	2.13			MO	0005 5	7191891	(Z147907) A134158	GREY GRVL 0003 BRWN SILT SAND 0010
GRIMSBY TOWN (NORTH	17	616640	4783546	2015-10 7215				MO		7254466	(Z203557) A197147 A	
GRIMSBY TOWN (NORTH	17	616685	4783471	2022-08 7324						7435261	(C57909) A353131 P	
GRIMSBY TOWN (NORTH	17	616708	4783476	2020-01 7241	2		///:	TH MO	0015 10	7354155	(Z329076) A283802	BRWN SAND 0008 BRWN SILT 0016 GREY SILT SAND 0025
GRIMSBY TOWN (NORTH	17	616985	4783663	2020-10 7687	2			MO	0017 12	7373653	(Z340232) A299797	BRWN FILL 0006 RED SHLE ROCK 0017
GRIMSBY TOWN (NORTH	17	616767	4783525	2020-01 7241	2		///:	TH MO	0005 10	7354153	(Z329078) A283804	BRWN SAND 0002 BRWN SAND SILT 0010 BRWN SILT SAND 0015

GRIMSBY TOWN (NORTH	17	616730	4783464	2020-01 7241	2		///:	TH MO	0007 10	7354154	(Z329077) A283803	BRWN SAND 0004 BRWN SILT 0012 GREY SILT 0017
GRIMSBY TOWN (NORTH	17	616797	4783257	2021-03 6988						7389870	(C49293) A314260 P	
GRIMSBY TOWN (NORTH	17	616677	4783527	2014-12 7324	1.97	FR 0008		MO	0004 5	7267158	(Z178449) A154693	BRWN SAND SILT 0009
GRIMSBY TOWN (NORTH	17	616772	4783354	2016-01 7241	2			MT	0010 10	7257968	(Z209988) A177072	BLCK ---- HARD 0000 BRWN TILL CLAY SOFT 0010 BRWN CLAY TILL SOFT 0020
GRIMSBY TOWN (NORTH	17	616876	4783442	2017-11 7215	2	13		TH	0010 10	7301154	(Z274508) A238148	BRWN FILL LOOS 0010 BRWN CLAY SILT 0020
GRIMSBY TOWN (NORTH	17	616792	4783374	2016-01 7241	2			MT	0010 10	7257966	(Z209990) A177074	BLCK ---- HARD 0000 BRWN TILL CLAY SOFT 0010 BRWN CLAY TILL SOFT 0020
GRIMSBY TOWN (NORTH	17	616631	4783522	2015-08 7215	2	UT 0009		TH	0015 10	7256257	(Z203519) A197147	FILL 0013 RED CLAY WBRG 0015
GRIMSBY TOWN (NORTH 01 434	17	617120	4783570	2004-08 6607	1.97	FR 0013		NU	0007 10	3804313	(Z17064) A015794	CLAY 0003 SAND 0013 CLAY 0017
GRIMSBY TOWN (NORTH 04 434	17	616990	4783670	2005-12 6607						3804310	(Z24171) A015794 A	
GRIMSBY TOWN (NORTH CON 01 009	17	617052	4783249	2017-05 7472	2			MO	0015 10	7292483	(Z259581) A227342	RED CLAY SILT PCKD 0025
GRIMSBY TOWN (NORTH CON 01 009	17	617132	4783083	2010-07 6946	2.04	0		MO	0010 7	7149166	(Z109139) A091093	BRWN SAND GRVL LOOS 0001 BRWN SAND LOOS 0005 GREY SILT CLAY TILL 0008 BRWN SILT CLAY TILL 0020
GRIMSBY TOWN (NORTH CON 01 010	17	616782	4783364	2016-01 7241	2			MT	0015 10	7257967	(Z209989) A177073	BLCK ---- HARD 0000 BRWN TILL CLAY SOFT 0010 BRWN CLAY TILL SOFT 0025
GRIMSBY TOWN (NORTH CON 01 010	17	616613	4783542	2004-09 7215	1				0007 10	3804207	(Z15676) A015587	
GRIMSBY TOWN (NORTH CON 01 010	17	616752	4783506	2020-01 7282	2	5	///:	MO	0006 5	7360356	(RJ6ARJ6L) A269940	FILL GRVL 0001 BRWN SAND 0011
GRIMSBY TOWN (NORTH CON 01 010	17	616844	4783430	2014-10 7295	1.79			MO	0005 10	7234478	(Z192920) A156066	BRWN FILL 0005 BRWN CLAY 0015
GRIMSBY TOWN (NORTH CON 01 010	17	616710	4783505	2020-01 7282	2	5	///:	MO	0004 10	7360357	(2P4BW97H) A269940	FILL GRVL 0001 BRWN SAND 0014

GRIMSBY TOWN (NORTH CON 01 010	17	616638	4783541	2015-01 7241	2.04			MT	0005 10	7237524	(Z167445) A161935	BRWN SAND GRVL SOFT 0011 GREY SILT CLAY SOFT 0015
GRIMSBY TOWN (NORTH CON 01 010	17	616636	4783545	2015-08 7215	0			TH	0015 10	7256256	(Z203518) A189448	FILL 0002 RED CLAY WBRG 0014 GREY CLAY 0015

R.J. Burnside & Associates Limited