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Functional Servicing and Stormwater Management Report

The Woolverton
13 Mountain Street & 19-23 Elm Street, Grimsby

Woolverton Holdings Corp.

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13 Mountain Street & 19-23 Elm Street, Grimsby

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

May 2025
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Revision	Date	Description
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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 19-23 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 an 8-storey residential building with 177 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 May 16, 2025).

2.1.1 Ownership Structure

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

3.0 Water Servicing

3.1 Existing Water Infrastructure

Based on 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 3.59 L/s for the maximum hourly demand and 1.51 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 Fire Underwriters Survey (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 3,118 USGPM (196.5 L/s), the watermain will operate at a pressure of 31 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, therefore 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 on 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).

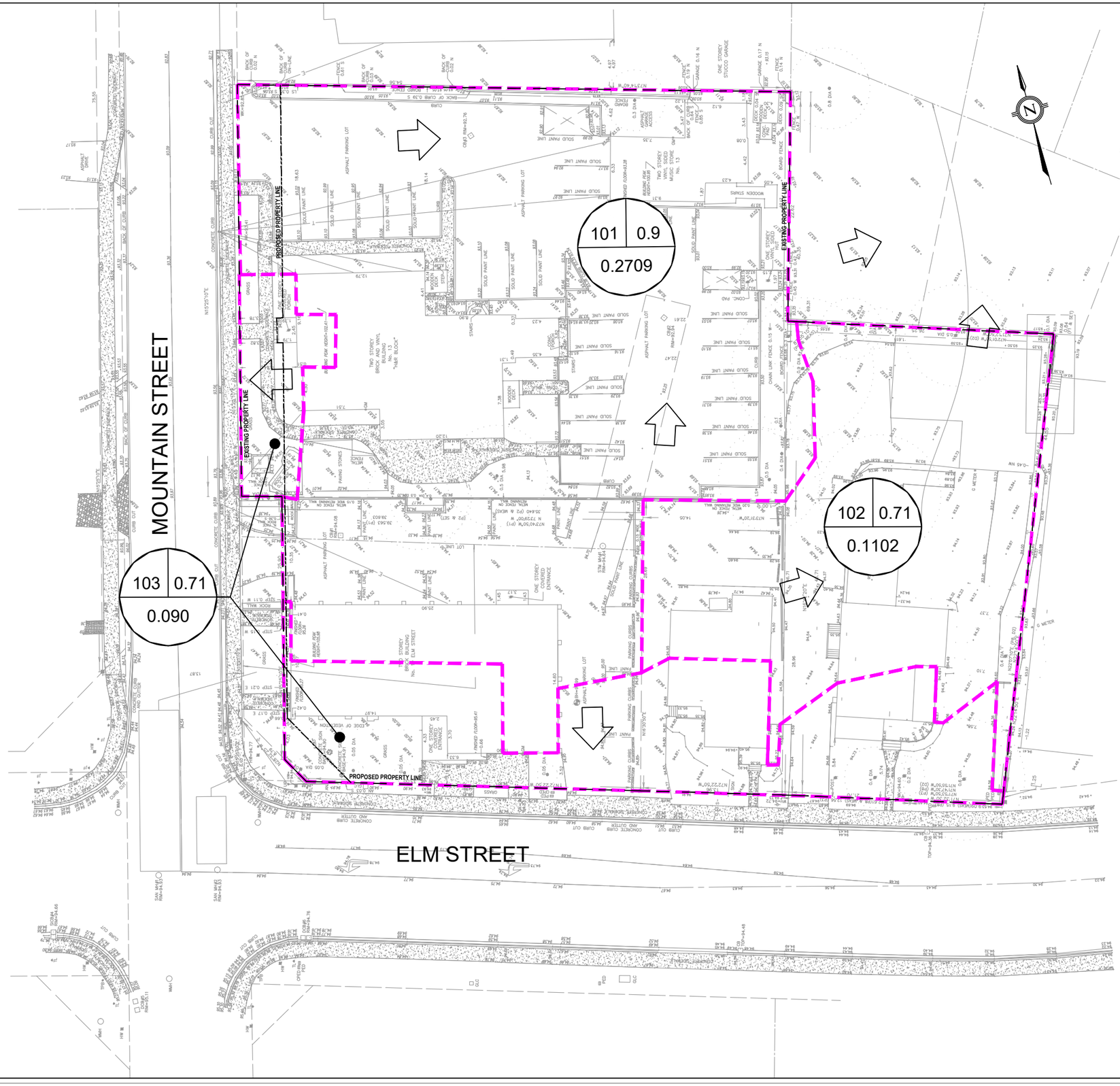
A CCTV investigation of the existing storm sewer was completed to verify the alignment and condition of the existing 300 mm storm sewer connection to Balsam Lane. Based on the results of the CCTV investigation, two areas of concern in the existing 300 mm storm sewer were identified. These areas of concern 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.

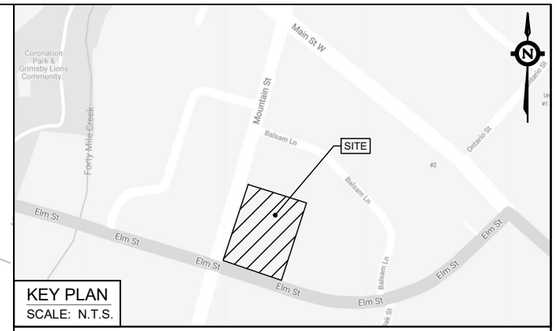
4.2 Existing Drainage Conditions

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	1102	0.70	14.4 L/s	30.1 L/s
Total Drainage to Balsam Lane		**3811**		**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

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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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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)	0.027	0.109	62%	0.161	92%
Proposed Condition (2-Year Storm Event with 100-year Controlled Flow from Site)	0.052	0.134	76%	0.186	106%

*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

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 & 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 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 (m²)	C	Q (2-Year)	Q (100-Year)
Controlled To Balsam from SWM Tank (majority of Site including Roof and patio areas)	201	4019	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
Total to Balsam Lane		**4063**		**27.1 L/s**	**52.47 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		**4710**		**38.02 L/s**	**75.32 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.

4.5.4 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, and 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.

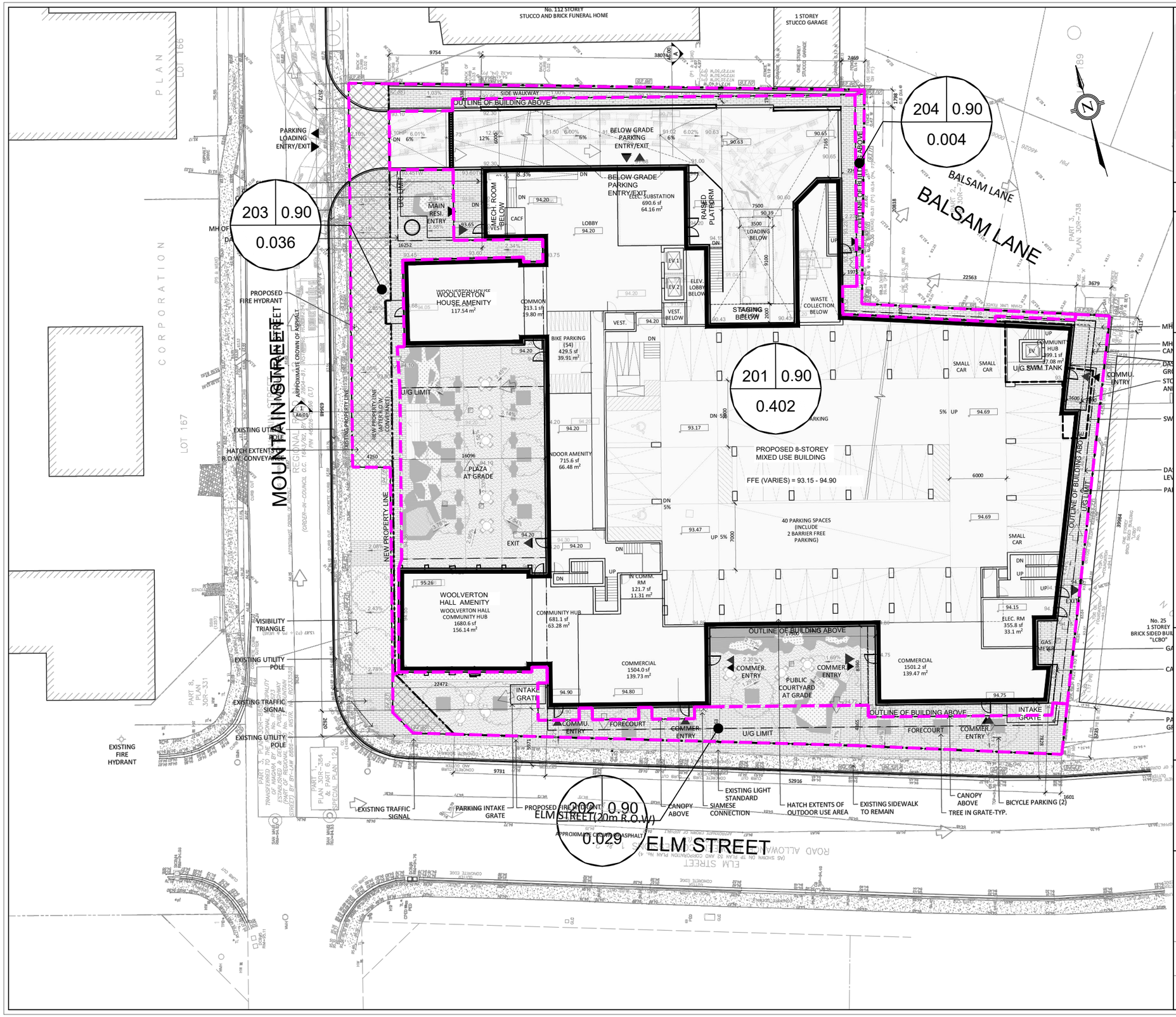
4.7 Erosion and Sediment Control

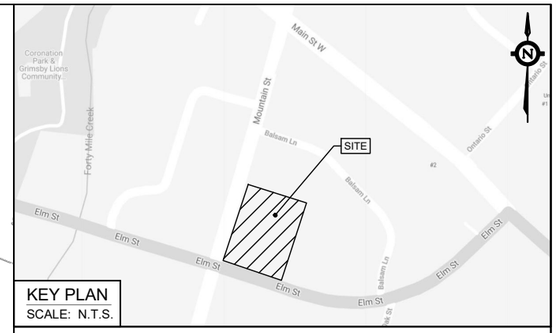
The Erosion and Sediment Control (ESC) strategy has been designed in conformance with the Stormwater Management Guidelines (December 2022) and will be subject to Region of Niagara and Town of Grimsby approval prior to issuance of Building Permit.

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 for further details.





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- 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: May 15, 2025 - 1:34 PM

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 3. The proposed new Commercial Area for the site is 277.6 m^2, with an equivalent population of 6. The proposed development will have 177 residential units, with an equivalent population of 318 persons. Refer to the Site statistics provided by the Architect (dated May 16, 2025), 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 the groundwater and infiltration allowance) is 5.02 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)	177 units	318	
Groundwater Allowance	-	-	1.00
Infiltration Allowance	-	-	0.14
Total	-	**327**	5.02

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 3.59 L/s for maximum hourly demand and 1.51 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.
- 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 19-23 Elm Street (including the infiltration and groundwater allowances) has been calculated as 5.02 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]

Drawings

EXISTING FIRE HYDRANT

WATER METER, BACKFLOW PREVENTOR, AND DETECTOR ASSEMBLY LOCATED IN MECHANICAL ROOM ON P1 LEVEL, REFER TO MECHANICAL DRAWINGS FOR DETAILS.

TRENCH DRAIN
TOP=92.67

TRENCH DRAINS TO BE CONNECTED INTERNALLY TO MECHANICAL SYSTEM

CONNECT INTO EXISTING 250mmØ WATERMAIN

150mmØ DOMESTIC

200mmØ FIRE

90° BEND

VB

200mmØ WATERMAIN

250x250 x200 TEE

200x200 x150 TEE

INV=91.80
MECH. RM

OVERHEAD DOOR

CONNECT PROPOSED 300mm SANITARY SEWER TO EXISTING 375mm SANITARY SEWER

MH1A (1200Ø)
TOP=91.51
E INV=90.40
EX. S INV=90.12
EX. N INV=90.10

1.4m-300mmØ PVC SAN @ 1.50%
INV=90.59

MH2A (CTRL MH)
(1200Ø)
TOP=93.43
E INV=90.59
W INV=90.59

9.2m-300mmØ PVC Pipe SI SAN @ 1.50%

PROPOSED FIRE HYDRANT (TO BE LOCATED IN MUNICIPAL ROW)

150mmØ WATERMAIN

CONNECT INTO EXISTING 250mmØ WATERMAIN

250x250 x150 TEE

OUTLINE OF BUILDING ABOVE

PLUG

BALSAM LANE

STORMWATER TANK
60 m³ @ 1.40m DEPTH OF ACTIVE STORAGE
BOTTOM OF TANK ELEV. = 90.85
TOP OF TANK ELEV.= 92.40
OUTLET INVERT ELEV.= 91.00
HWL= 92.18

OUTLINE OF UNDERGROUND LEVEL

PROP.MH1
(1200Ø)
TOP=92.19
S INV=90.64
SW INV=90.59
NE INV=90.58

31.0m-300mmØ STM @ 0.8%

MH1
TOP=93.11
S INV=90.93
N INV=90.90

2.4m-250mmØ STM @ 0.9%

MH2 (OGS EF4)
TOP=93.07
S INV=90.98
N INV=90.95

2.1m-250mmØ STM @ 1.0%

PROPOSED 150mm ORIFICE AT TANK OUTLET INV= 91.00

SWM TANK

AD4
TOP=93.00

CONNECT AD4 DIRECTLY TO PROPOSED STORMWATER TANK

STORM TANK INSPECTION AND OVERFLOW HATCH

MOUNTAIN STREET

EXISTING PROPERTY LINE

NEW PROPERTY LINE

OUTLINE OF UNDERGROUND LEVEL

OUTLINE OF BUILDING ABOVE

AD1
TOP=93.95

AD1 AND AD2 TO BE CONNECTED INTERNALLY TO MECHANICAL SYSTEM

AD2
TOP=94.00

PROPOSED 8-STOREY MIXED USE BUILDING

FFE (VARIES) = 93.15 - 94.90

OUTLINE OF BUILDING ABOVE

AD3 TO BE CONNECTED INTERNALLY TO MECHANICAL SYSTEM

OUTLINE OF BUILDING ABOVE

AD3
TOP=94.60

AD5
TOP=94.60

AD5 TO BE CONNECTED INTERNALLY TO MECHANICAL SYSTEM

OUTLINE OF BUILDING ABOVE

INTAKE GRATE

INTAKE GRATE

EXISTING FIRE HYDRANT

LOCATED IN MUNICIPAL ROW)

150mmØ PVC WATERMAIN

OUTLINE OF UNDERGROUND LEVEL

VB

VB

CONNECT INTO EXISTING 150mmØ WATERMAIN VIA CUT IN TEE

150x150 x150 TEE

ELM STREET

KEY PLAN
SCALE: N.T.S.

LEGEND:

- SITE PROPERTY LINE
- PROPOSED PROPERTY LINE
- LIMIT OF CONSTRUCTION
- OUTLINE OF BUILDING ABOVE
- OUTLINE OF BUILDING BELOW
- PROPOSED BUILDING ENTRANCE
- STORM SEWER AND MANHOLE
- SANITARY SEWER AND MANHOLE
- WATERMAIN
- EXISTING STORM SEWER AND MANHOLE
- EXISTING SANITARY SEWER AND MANHOLE
- WATERMAIN
- EXISTING PIPE REMOVAL
- QUALITY CONTROL DEVICE
- CATCHBASIN / DOUBLE CATCHBASIN
- CATCHBASIN MANHOLE
- AREA DRAIN
- HYD — HYDRANT AND VALVE
- VB — VALVE & BOX
- M — WATER METER

SITE PLAN
PREPARED BY: STUDIO JCI
DATE: MAY 16, 2025

TOPOGRAPHIC & LEGAL
PREPARED BY: J.D. BARNES LIMITED
DATE: JUNE 19, 2024

BENCHMARK NOTES
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LICENSED PROFESSIONAL ENGINEER
A. E. KROETSCH
100072069
May 16, 2025
PROVINCE OF ONTARIO

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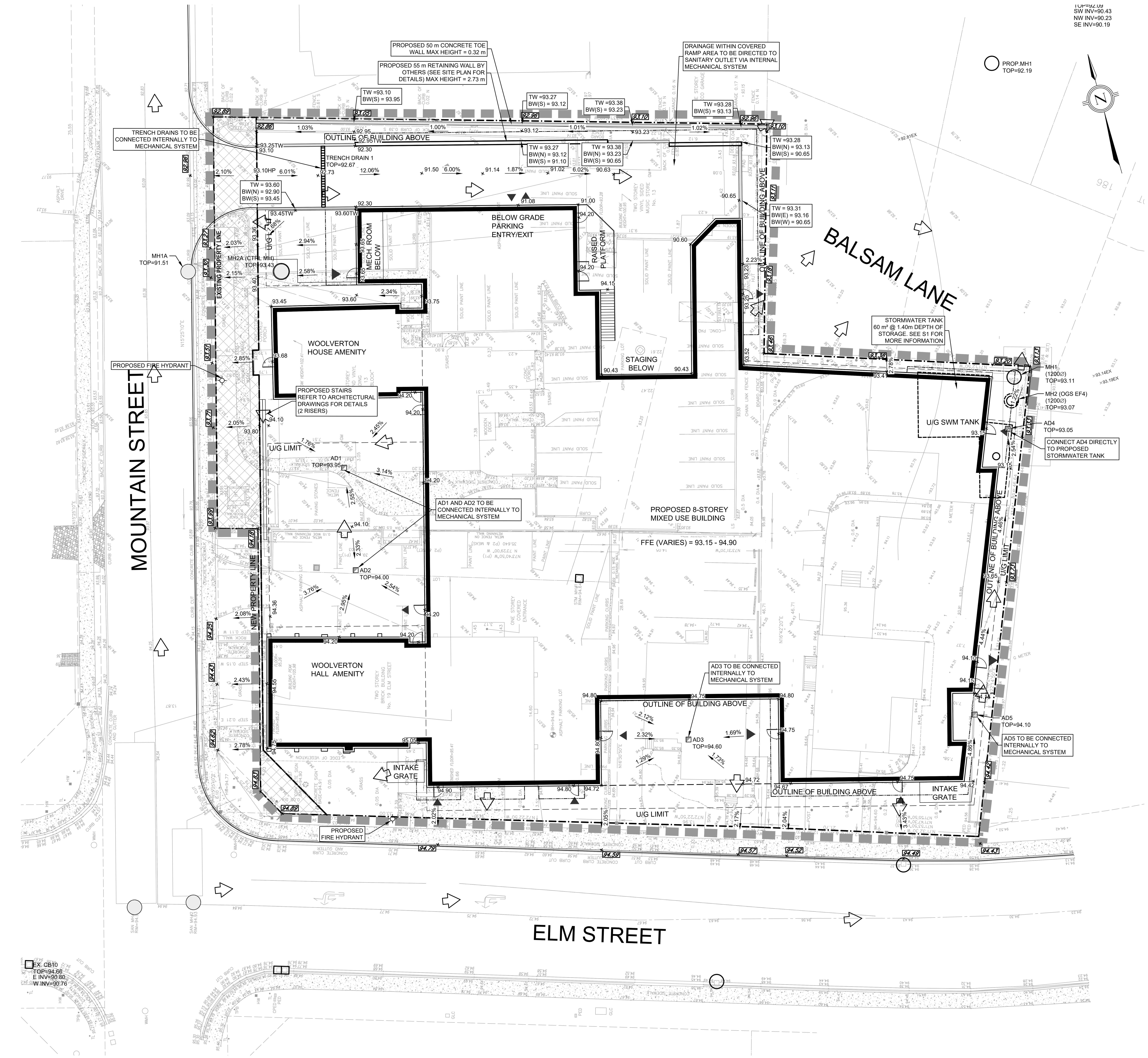
Client
WOOLVERTON HOLDINGS CORP.

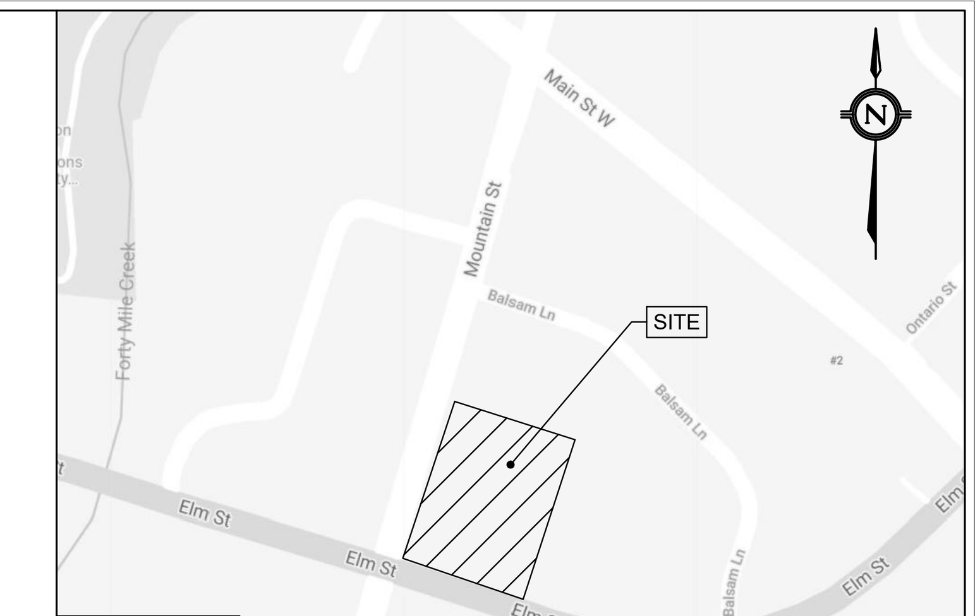
180 BLOOR STREET WEST, SUITE 701
TORONTO, ON
M5S 1T6

Drawing Title
THE WOOLVERTON
13 MOUNTAIN STREET & 19-23 ELM STREET
GRIMSBY, ON L3M 3J7

PRELIMINARY SITE SERVICING PLAN

Drawn	Checked	Designed	Checked	Date	Drawing No.
GP	AK	LG	AK	21/03/25	S1
Project No. 300053081		Contract No.		Revision No.	
Scale 1:200					





KEY PLAN
SCALE: N.T.S.

LEGEND:

- EXISTING SITE PROPERTY LINE
- PROPOSED PROPERTY LINE
- OUTLINE OF UNDERGROUND (BELOW)
- LIMIT OF CONSTRUCTION
- PROPOSED BUILDING ENTRANCE
- 48.79 — EXISTING ELEVATIONS
- 48.79 — EXISTING ELEVATIONS TO MATCH
- 48.21 — FINISHED GROUND ELEVATION
- 48.29TC — TOP OF CURB ELEVATION
- 48.29TW — TOP OF WALL ELEVATION
- OVERLAND FLOW ROUTE
- 2.00% — PROPOSED SLOPES
- QUALITY CONTROL DEVICE
- CATCHBASIN / DOUBLE CATCHBASIN
- AREA DRAIN
- MANHOLE
- HYD — HYDRANT AND VALVE
- VB — VALVE & BOX

SITE PLAN
PREPARED BY: STUDIO JCI
DATE: MAY 16, 2025

TOPOGRAPHIC & LEGAL
PREPARED BY: J.D. BARNES LIMITED
DATE: JUNE 19, 2024

BENCHMARK NOTES
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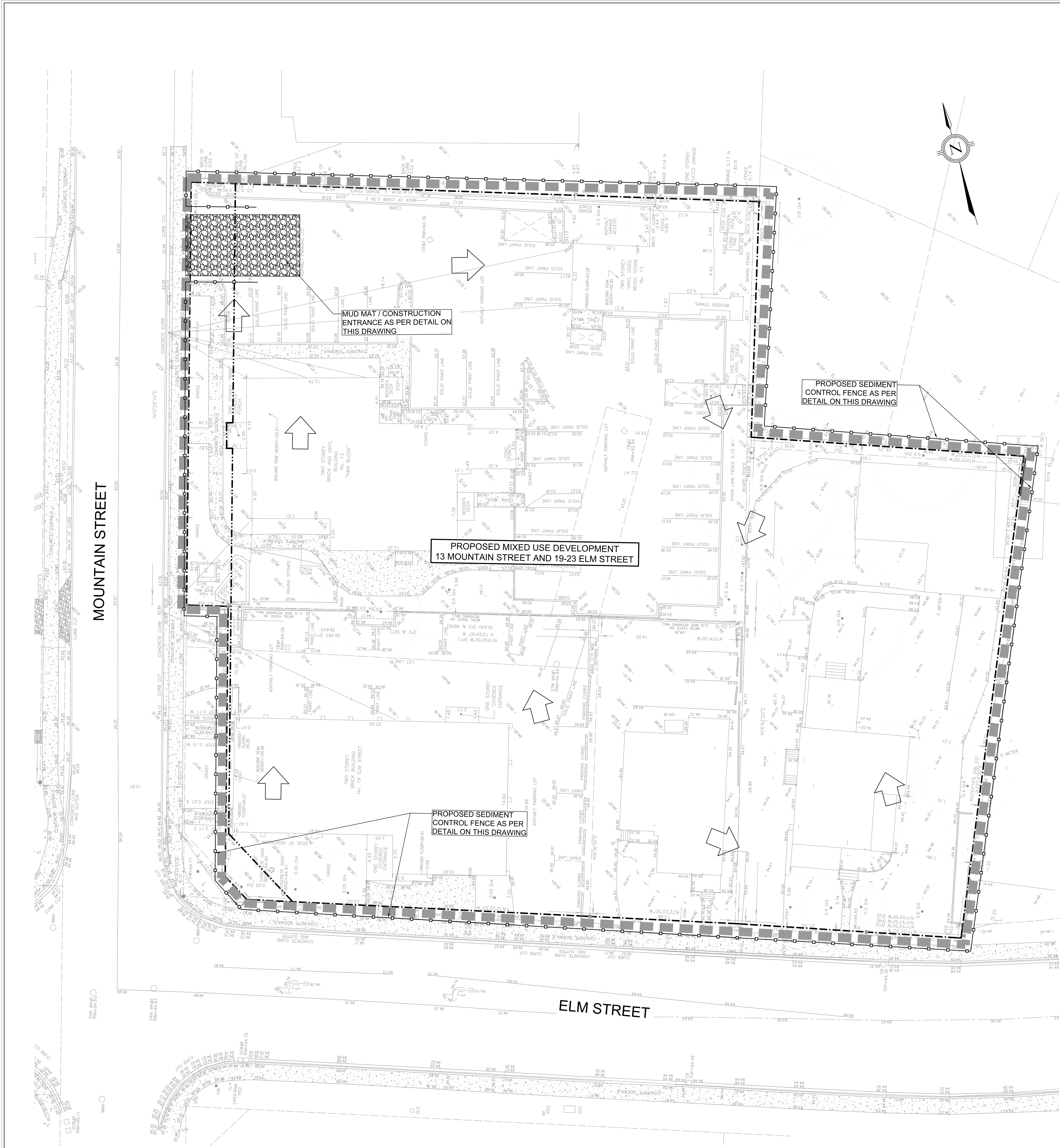
M5S 1T6

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

PRELIMINARY SITE GRADING PLAN

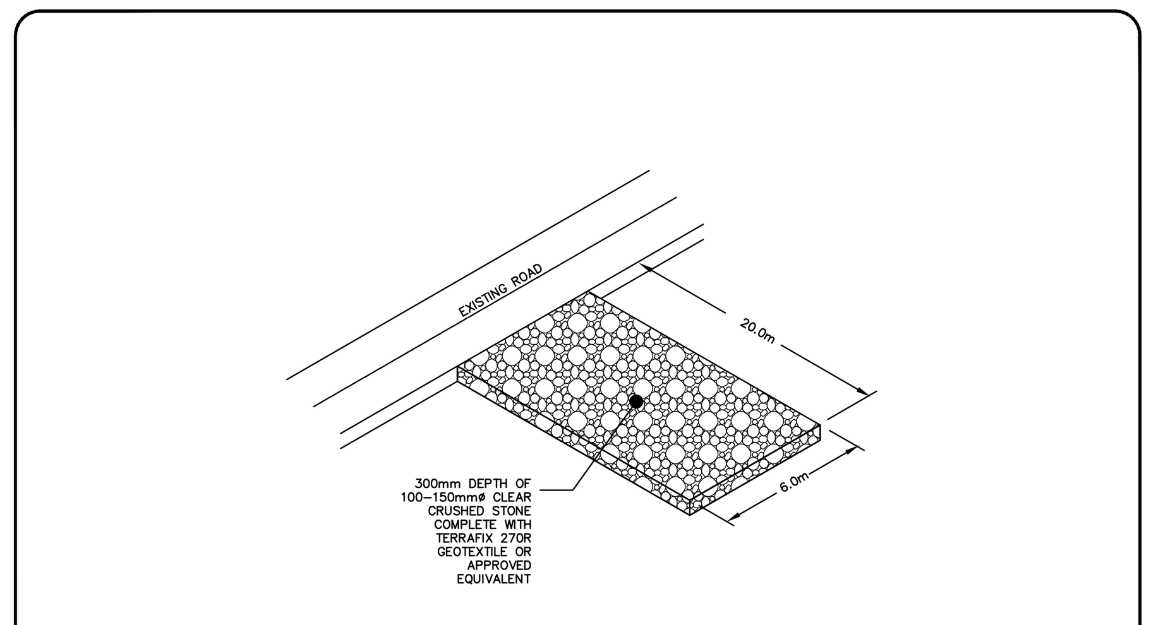
Drawn	Checked	Designed	Checked	Date	Drawing No.
GP	AK	LG	AK	21/03/25	G1
Project No. 300053081		Contract No.		Revision No.	
Scale 1:200					

0 4.0 8.0 12.0m

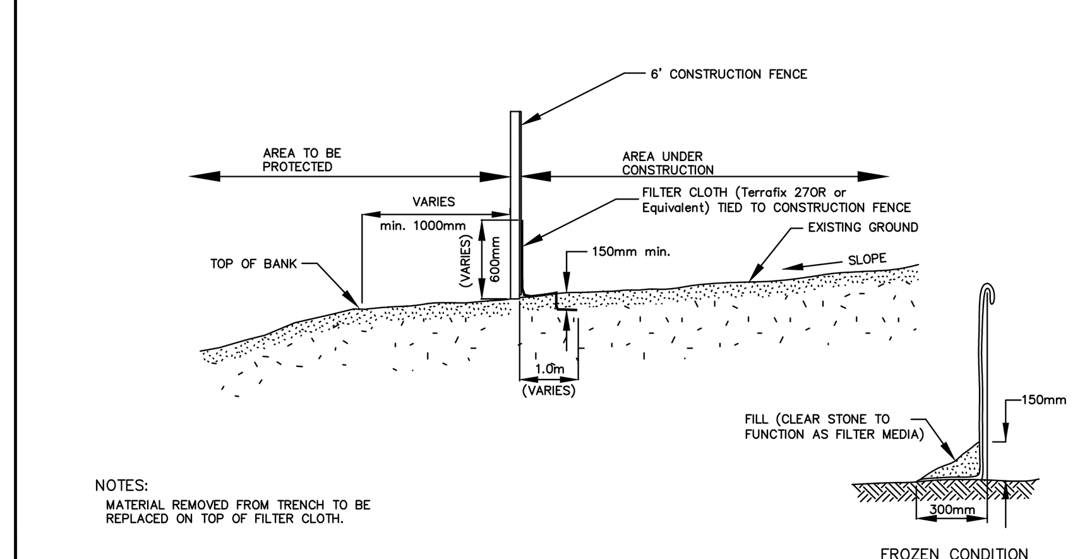


EROSION & SEDIMENT CONTROL:

1. EROSION AND SEDIMENT CONTROL (ESC) MEASURES WILL BE IMPLEMENTED PRIOR TO, AND MAINTAINED DURING CONSTRUCTION PHASES, TO PREVENT ENTRY OF SEDIMENT INTO THE WATER. ALL DAMAGED EROSION AND SEDIMENT CONTROL MEASURES SHOULD BE REPAIRED OR REPLACED WITHIN 48 HOURS OF INSPECTION OR BOTH.
2. ALL DISTURBED AREAS WILL BE MINIMIZED TO THE EXTENT POSSIBLE, AND TEMPORARILY OR PERMANENTLY STABILIZED OR RESTORED AS THE WORK PROGRESSES.
3. THE EROSION AND SEDIMENT CONTROL STRATEGIES OUTLINED ON THE PLANS ARE STATIC AND MAY NEED TO BE UPGRADED/AMENDED AS SITE CONDITIONS CHANGE TO MINIMIZE SEDIMENT LADEN RUNOFF FROM LEAVING THE WORK AREA. IF THE PRESCRIBED MEASURES ON THE PLANS ARE NOT EFFECTIVE IN PREVENTING THE RELEASE OF A DELETERIOUS SUBSTANCE, THEN ALTERNATIVE MEASURES MUST BE IMPLEMENTED IMMEDIATELY TO MINIMIZE POTENTIAL ECOLOGICAL IMPACTS AND A TORONTO REGION CONSERVATION AUTHORITY ENFORCEMENT OFFICE SHOULD BE IMMEDIATELY CONTACTED. ADDITIONAL ESC MEASURES TO BE KEPT ON SITE AND USED AS NECESSARY.
4. ALL ACTIVITIES, INCLUDING MAINTENANCE PROCEDURES, WILL E CONTROLLED TO PREVENT THE ENTRY OF PETROLEUM PRODUCTS, DEBRIS, RUBBLE, CONCRETE OR OTHER DELETERIOUS SUBSTANCES INTO THE WATER. VEHICULAR REFUELING AND MAINTENANCE AND REFUELING WILL BE CONDUCTED A MINIMUM OF 30 m FROM THE WATER.
5. ALL GRADES WITHIN THE REGULATORY FLOOD PLAN WILL BE MAINTAINED OR MATCHED.
6. IF NECESSARY, TRUCKS WILL BE WASHED DOWN BEFORE LEAVING THE SITE.
7. THE SITE WILL BE WET DOWN IF NECESSARY TO CONTROL DUST.
8. ALL CONSTRUCTION EQUIPMENT MUST BE PARKED ON-SITE.
9. SEDIMENT CONTROL FENCE TO BE AS PER DETAIL ON THIS DRAWING.
10. ALL SILTSACK SEDIMENT CONTROL DEVICES TO BE ROUTINELY INSPECTED AND MAINTAINED IN PROPER WORKING ORDER UNTIL AREA IS STABILIZED.
11. SILTSACK TO BE PLACED UNDER GRATES ON ALL CATCHBASINS TO TRAP SEDIMENT. SILTSACK ARE TO BE CLEANED REGULARLY AND ARE NOT TO BE REMOVED UNTIL SUCH TIME AS THE CURBS ARE CONSTRUCTED AND THE BOULEVARDS ARE SODDED OR BACKYARDS GRADED AND SODDED. SILTSACK FOR SILT CONTROL TO BE TERRA FIX SILTSACK OR APPROVED EQUIVALENT AS PER DETAIL ON DRAWING D1.
12. IN THE CASE OF ANY CONFLICT WITH ANOTHER PLAN, THIS PLAN PREVAILS ONLY IN RESPECT TO CONSTRUCTION MEASURES AND ACTIVITIES SUCH AS THE CONSTRUCTION ACCESS, SILT FENCE, SECURITY FENCING, SEDIMENT CONTROL, AND MUD MATS.
13. STREET SWEEPING, CATCH BASIN CLEANING AND DUST CONTROL ARE THE RESPONSIBILITY OF THE DEVELOPER AND MUST BE KEPT UNDER CONTROL ON ALL ROADWAYS TO THE SATISFACTION OF THE CITY.
14. APPROPRIATE SIGNAGE IS TO BE INSTALLED ON THE BOULEVARD TO INDICATE THAT THE SIDEWALK IS NOT ACCESSIBLE.



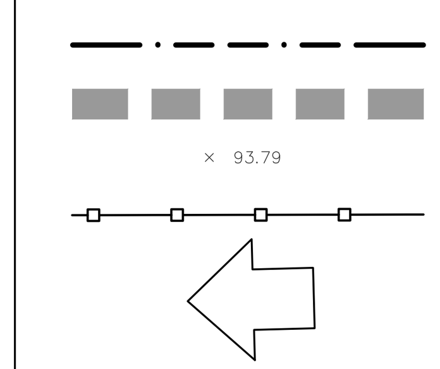
MUD MAT - CONSTRUCTION ACCESS
SCALE: N.T.S.



CONSTRUCTION/SEDIMENT CONTROL FENCE
SCALE: N.T.S.

KEY PLAN
SCALE: N.T.S.

LEGEND:



SITE PLAN
PREPARED BY: STUDIO JCI
DATE: MAY 16, 2025

TOPOGRAPHIC & LEGAL
PREPARED BY: J.D. BARNES LIMITED
DATE: JUNE 19, 2024

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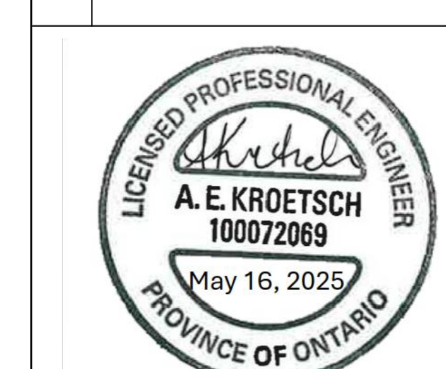

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180 BLOOR STREET WEST, SUITE 701
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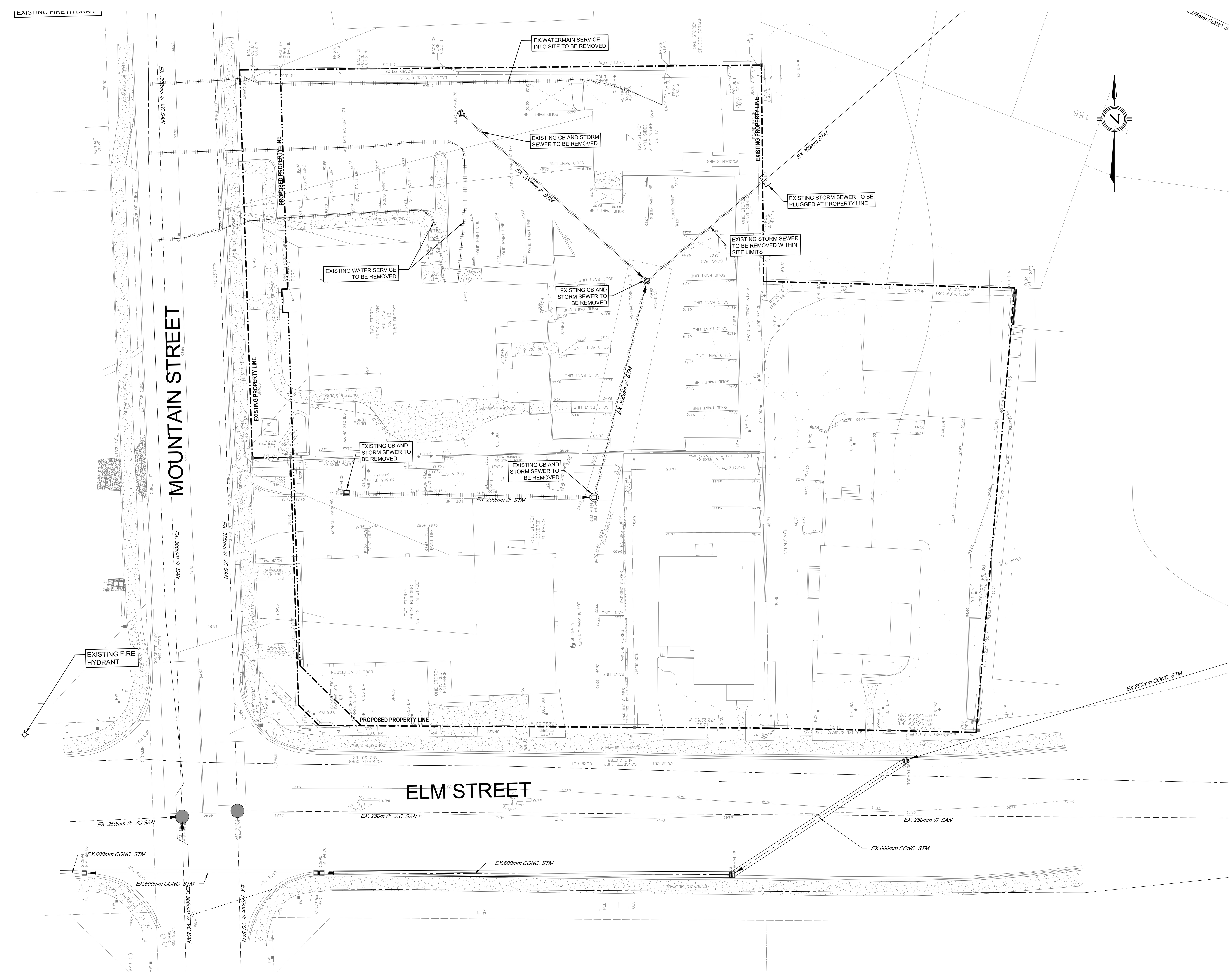
M5S 1T6

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

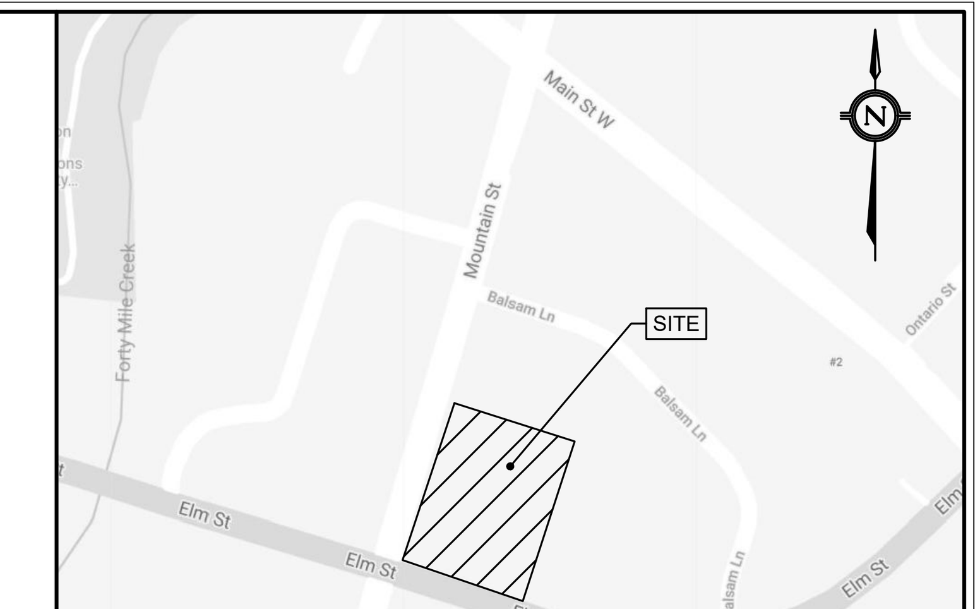
EROSION AND SEDIMENT CONTROL PLAN

Drawn	Checked	Designed	Checked	Date	Drawing No.
GP	AK	LG	AK	21/03/25	ESC1
Project No. 300053081		Contract No.		Revision No.	
Scale 1:200	0 4.0 8.0 12.0m				



REMOVALS NOTE:

1. ALL UNDERGROUND, ABOVEGROUND, AND SURFACE WORKS TO BE REMOVED WITHIN SITE LIMITS.
2. THE TWO EXISTING BUILDINGS AT 21 & 23 ELM STREET ARE TO BE DEMOLISHED.
3. ONLY THE EXISTING TWO STOREY BRICK BUILDINGS AT 19 ELM STREET AND 13 MOUNTAIN STREET WILL REMAIN AND BE INTEGRATED INTO PROPOSED DESIGN. SEE SITE PLAN PREPARED BY STUDIO JCI FOR DETAILS.



KEY PLAN
SCALE: N.T.S.

LEGEND:

- EXISTING PROPERTY LINE
- PROPOSED PROPERTY LINE
- SERVICE REMOVALS

SITE PLAN
PREPARED BY: STUDIO JCI
DATE: MAY 16, 2025

TOPOGRAPHIC & LEGAL
PREPARED BY: J.D. BARNES LIMITED
DATE: JUNE 19, 2024

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100072069
May 16, 2025
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M5S 1T6

Drawing Title
THE WOOLVERTON
13 MOUNTAIN STREET & 19-23 ELM STREET
GRIMSBY, ON L3M 3J7

EXISTING CONDITIONS AND REMOVALS PLAN

Drawn	Checked	Designed	Checked	Date	Drawing No.
GP	AK	LG	AK	21/03/25	EX1
Project No. 300053081		Contract No.		Revision No.	
Scale 1:200		0 4.0 8.0 12.0m			

File: \\pops\Shared Work Areas\053081 - 13 Mountain and 19 Elm Grimsby\03_ProductionDwg\053081 - EXISTING CONDITIONS AND REMOVALS.dwg Date Plotted: May 15, 2025 - 1:34 PM

Plotted by:MLeji Paper size: ARCH D (24.00 X 36.00 Inches) Plot table: Rjb Full Scale-pickering 2013.ctb

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)	2,798.8
LOT COVERAGE %	62%
HERITAGE BUILDING (6% OF SITE AREA)	273.7
-EXISTING WOOLVERTON HOUSE AREA	117.5
-EXISTINGWOOLVERTON HALL AREA	156.2

02. FLOOR AREA SUMMARY	(m^2)
TOTAL GCA (including Parking below grade)	22,801.2
TOTAL GCA (excluding Parking below grade)	19,608.7
NEW RESIDENTIAL GFA	12,472.0
NEW NON-RESIDENTIAL GFA (At Grade Commercial)	279.1
TOTAL GFA	12,751.1
COMMUNITY HUB (not includes in GFA)	449.5
NUMBER OF STORIES	8

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)	**2.83**

04. RESIDENTIAL UNITS	PROPOSED
TOTAL	**177**

05. CAR PARKING	PROPOSED
STANDARD PARKING	134
SMALL CAR PARKING	8
ACCESSIBLE PARKING	6
CAR-SHARE	2
TOTAL	**150**

06. BIKE PARKING	PROPOSED
RESIDENTIAL	54
RETAIL	2
TOTAL	**56**

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

08. BUILDING HEIGHT	PROPOSED
BUILDING HEIGHT	**29.85 m**
BUILDING HEIGHT *(including mech)*	**34.00 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 8th floor.

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. Building GFA excludes amenity spaces, community hubs, corridors and vertical and horizontal circulation, above grade parking and all other common areas.

AREA BREAKDOWN

LEVEL	TOTAL GCA		RESIDENTIAL AREA		COMMERCIAL/ RETAIL		COMMUNITY HUB		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	m^2	sf
P1	3,192.5	34,363.8	0.0	0.0	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	250.5	2,696.0	0.0	0.0	1,409.7	15,174.2	173.4	1,866.2	0.0	0.0	2,441.5	26,280.2	279.1	3,004.4
INTERMIDIATE FLOOR	1,662.5	17,894.9	0.0	0.0	0.0	0.0	199.1	2,142.8	0.0	0.0	1,333.8	14,356.8	0.0	0.0	190.0	2,045.1	1,662.5	17,894.9	0.0	0.0
FLOOR 2	2,557.8	27,531.4	2,168.8	23,344.8	0.0	0.0	0.0	0.0	113.6	1,222.3	0.0	0.0	0.0	0.0	0.0	0.0	389.0	4,186.6	2,168.8	23,344.8
FLOOR 3	2,423.2	26,082.8	2,133.6	22,965.9	0.0	0.0	0.0	0.0	37.5	403.8	0.0	0.0	0.0	0.0	0.0	0.0	289.6	3,116.9	2,133.6	22,965.9
FLOOR 4	2,035.5	21,910.4	1,744.3	18,775.4	0.0	0.0	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	1,744.3	18,775.4
FLOOR 5	2,035.5	21,910.4	1,744.3	18,775.4	0.0	0.0	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	1,744.3	18,775.4
FLOOR 6	2,035.5	21,910.4	1,744.3	18,775.4	0.0	0.0	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	1,744.3	18,775.4
FLOOR 7	2,035.5	21,910.4	1,744.3	18,775.4	0.0	0.0	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	1,744.3	18,775.4
FLOOR 8	1,468.5	15,806.7	1,192.4	12,834.9	0.0	0.0	0.0	0.0	37.5	403.8	0.0	0.0	0.0	0.0	0.0	0.0	276.1	2,971.8	1,192.4	12,834.9
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	0.0	0.0	634.0	6,824.5	0.0	0.0
TOTAL	**22,801.2**	**238,605.6**	**12,472.0**	**134,247.1**	**279.1**	**3,004.4**	**449.5**	**4,838.8**	**338.6**	**3,644.9**	**5,473.1**	**58,912.2**	**173.4**	**1,866.2**	**190.0**	**2,045.1**	**6,857.6**	**66,990.4**	**12,751.1**	**137,251.5**

ABOVE GROUND GCA **19,608.7** **211,066.4**

VEHICULAR PARKING

VEHICULAR PARKING REQUIREMENTS - Site Specific ZBL (OLT-24-001)			
USE	**UNITS/GFA**	**MINIMUM PARKING RATE**	**MINIMUM REQUIRED**
RESIDENTIAL DWEILLING UNIT	177 units	1.00	177
RESIDENTIAL SUB-TOTAL			177
NON-RESIDENTIAL			
-RESIDENTIAL VISITOR	177 units	0.25	45
-RETAIL USE	279 sqm	1/28sqm	10
NON-RESIDENTIAL SUB-TOTAL			55
TOTAL PARKING REQUIREMENT			232

ACCESSIBLE PARKING REQUIREMENT	2 SPACES + 2% of supply	7

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 PARKING**					**RESIDENTIAL PARKING**				**TOTAL PARKING SUPPY**				
	STANDARD	ACCESSIBLE	SMALL CAR	CAR-SHARE	TOTAL	STANDARD	ACCESSIBLE	SMALL CAR	TOTAL	STANDARD	ACCESSIBLE	SMALL CAR	CAR-SHARE	TOTAL
P1	25	2	0	2	29	42	0	1	43	67	2	1	2	72
GROUND	0	0	0	0	0	35	2	3	40	35	2	3	0	40
INTERMIDIATE	0	0	0	0	0	32	2	4	38	32	2	4	0	38
TOTAL	**25**	**2**	**0**	**2**	**29**	**109**	**4**	**8**	**121**	**134**	**6**	**8**	**2**	**150**
* Tandem parking spaces do not count into total parking spaces. 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	177 units	0.3	54	54
RETAIL	10 spaces	7% of supply	1	2
TOTAL BICYCLE PARKING			**55**	**56**

LOADING AND WASTE

PROPOSED LOADING AND WASTE	
UNITS COUNT	177
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 OPA/ZBA1 May 16, 2025

Description: Date:

General Notes:

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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.

DRAFT

Architects:

STUDIO JCI

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

MULTI-UNIT RESIDENTIAL DEVELOPMENT

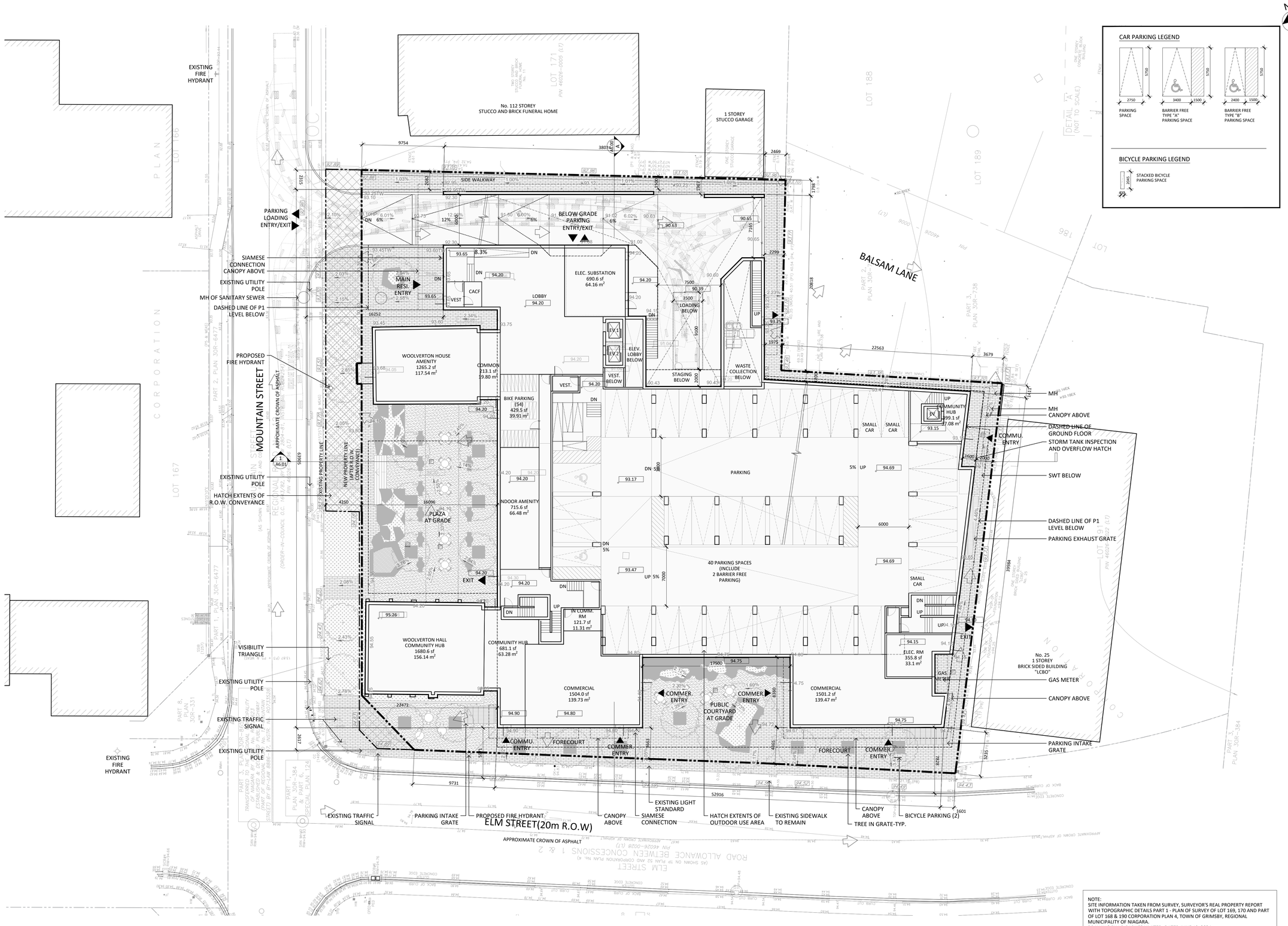
13 Mountain Street & 19 - 23 Elm Street
Grimsby, ON L3M 3J7

PROJECT STATISTICS

Project No.: 2416
Scale: NTS
Date: May 16, 2025
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 OPA/ZBA1	May 16, 2025
Description:	Date:

General Notes:

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MULTI-UNIT RESIDENTIAL DEVELOPMENT

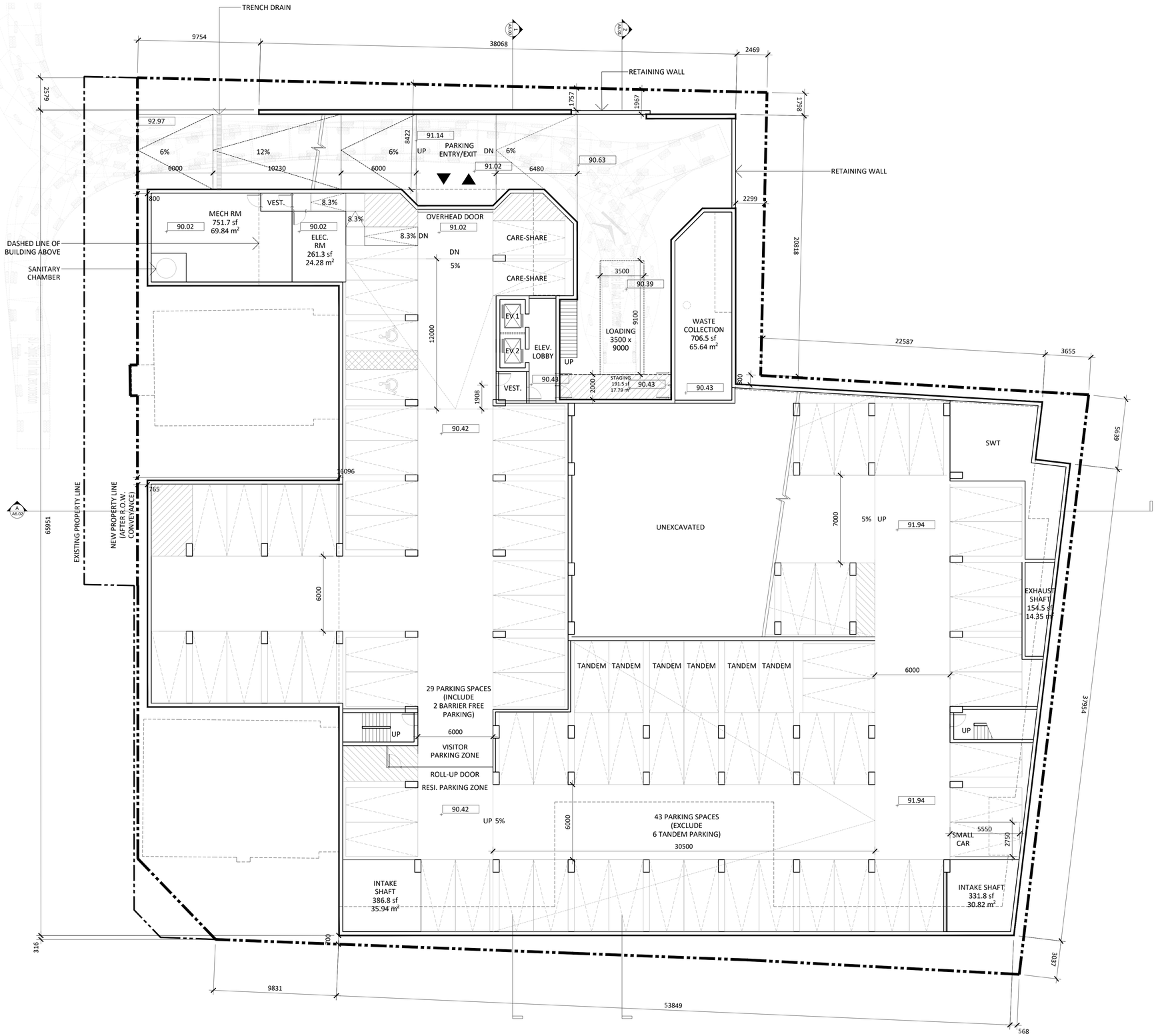
13 Mountain Street & 19 - 23 Elm Street
Grimsby, ON L3M 3J7

GROUND FLOOR SITE PLAN

Project No.:	2416
Scale:	1:200
Date:	May 16, 2025
Drawn by:	JCI

Drawing No.:

A1.01



Issued

Issued for OPA/ZBA1	May 16, 2025
Description:	Date:

General Notes:

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DRAFT

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

P1 FLOOR PLAN

Project No.:	2416
Scale:	1:150
Date:	May 16, 2025
Drawn by:	JCI

Drawing No.:

A3.0Z

Unit Count & Bedroom Breakdown for FSR Calcs.

Mike Gojsic

From: Jingshu Wang <jwang@studiojci.com>
Sent: Monday, April 21, 2025 7:25 PM
To: Mike Gojsic; Laura Galati
Cc: 'Sanjam Raisuada'; Sudipto Sengupta
Subject: FW: Grimsby_ZBA1 Submission Timeline

Hi Sanjam and Mike,

Following up on this email—Please find the unit mix breakdown attached for the purpose of calculations for the report. Kindly note that this has not been updated to reflect the marketing targets.

UNIT COUNT 21-Apr-25

FLOORS	Studio	1b	2b	3b	Total
	#	#	#	#	0
GF	0	0	0	0	0
INT	0	0	0	0	0
2	1	7	12	8	28
3	1	7	15	6	29
4	4	1	16	4	25
5	4	1	16	4	25
6	4	1	16	4	25
7	4	1	16	4	25
8	3	6	11	0	20
MPH	0	0	0	0	0
Total	21	24	102	30	177
%	12%	14%	58%	17%	100%

Regards,

Jingshu Wang
M.Arch.,OAA
Jr. Project Manager

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

STUDIO JCI

From: Jingshu Wang
Sent: April 21, 2025 7:19 PM
To: Chester Rennie <crennie@svn-ap.com>; Steven Pignataro <Steven.Pignataro@bagroup.com>; Eric Cornish

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

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:	May 11, 2025

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	2558	100%
Floor 2	2423	25%
Floor 3	2036	25%

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

Largest Area = 3,672 sq.m.

F = 10,665.77 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:	May 11, 2025

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) =	318	persons*	*From Sanitary Calculations (Niagara Region Water & Wastewater Master Servicing Plan (2021) Volume 3)
	Avg. Day Demand (Residential) =	240	L/cap/day	
		0.88	L/s	
	Max. Daily Peaking Factor =	1.66		
	Max. Hourly Peaking Factor =	4.0		
	Max. Day Domestic Flow Rate F_{dom} =	1.51	L/s	
		24	US GPM	
	Max. Hourly Domestic Flow Rate F_{dom} =	3.59	L/s	
		57	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	196.5	***31.0***	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"

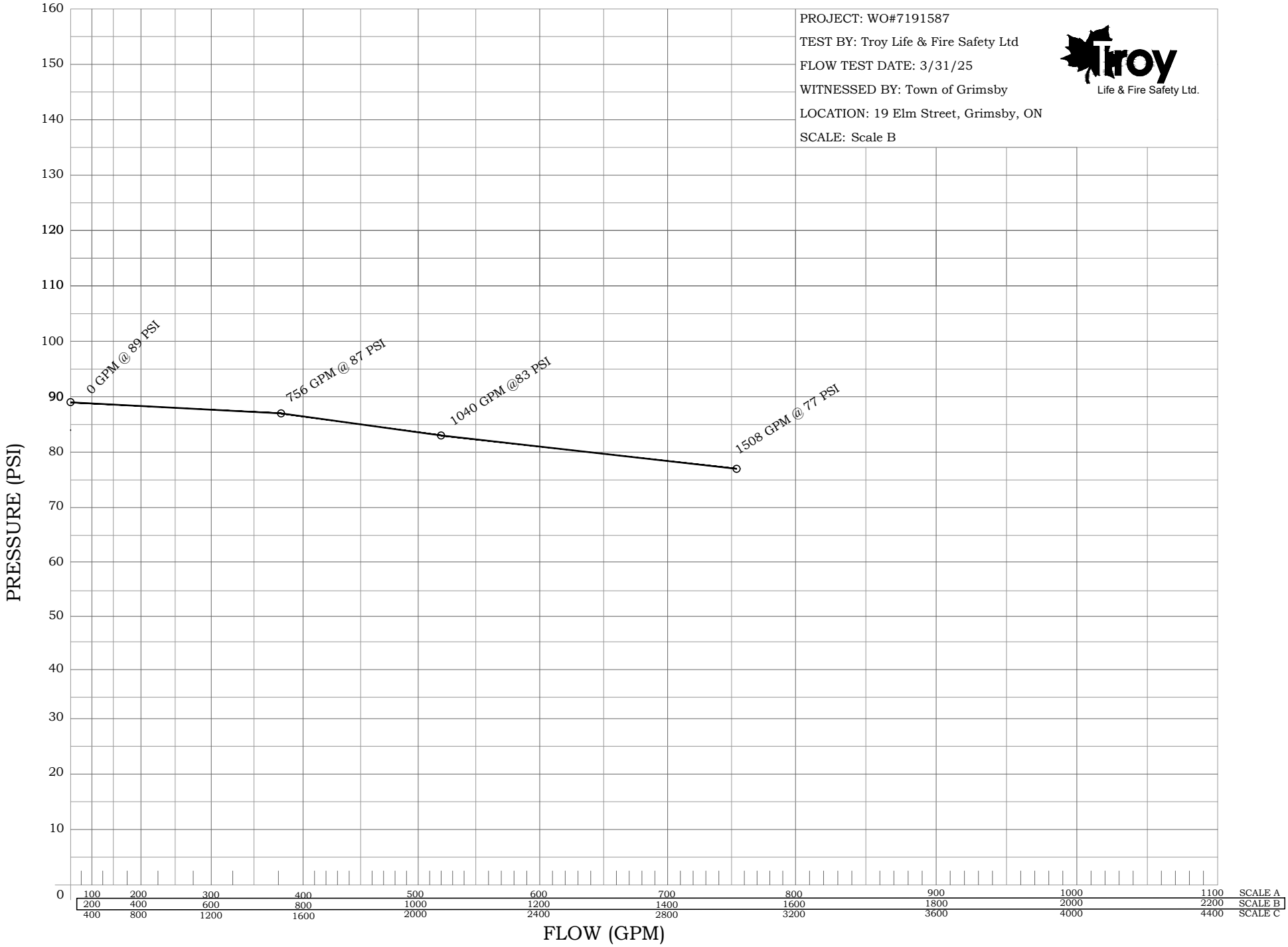
HYDRANT ELEVATION COMPARED TO BUILDING: No Elevation Change

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



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)	2,663.4
LOT COVERAGE %	59%
HERITAGE BUILDING (6% OF SITE AREA)	282.0

02. FLOOR AREA SUMMARY	(m^2)
TOTAL GCA (including Parking below grade)	22,814.4
TOTAL GCA (excluding Parking below grade)	19,608.7
GFA EXCLUSIONS (Grimsby by-Law No. 14-45,2019)	3,401.8
EXISTING RESIDENTIAL GFA (Woolverton House)	235.1
EXISTING NON-RESI. GFA (Woolverton Hall)	156.2
NEW RESIDENTIAL GFA	12,469.1
NEW NON-RESIDENTIAL GFA (At Grade Commercial)	277.6
TOTAL GFA	16,206.9
NUMBER OF STORIES	8

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)	**3.59**

04. RESIDENTIAL UNITS	PROPOSED
TOTAL	**177**

05. CAR PARKING	PROPOSED
STANDARD PARKING	136
SMALL CARE PARKING	8
ACCESSIBLE PARKING	6
TOTAL	**150**

06. BIKE PARKING	PROPOSED
RESIDENTIAL	54
RETAIL	2
TOTAL	**56**

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

08. BUILDING HEIGHT	PROPOSED
BUILDING HEIGHT *(including mech)*	**34.00 m**

BUILDING HEIGHT DETERMINED AS FOLLOWS:

Height measured from average finished grade of the front wall of the building along Montain Street and Elm street to the top 8th floor.

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. GFA is measure between the exterior faces of exterior walls of the building, excluding any cellar, basement, parking lot or mechanical room. Building GFA includes amenity spaces, vertical and horizontal circulation.

AREA BREAKDOWN

LEVEL	TOTAL GCA		NSA				LOCKERS		VEHICLE PARKING		INDOOR AMENITY		OUTDOOR AMENITY		GFA EXCLUSION		TOTAL GFA	
			RESIDENTIAL AREA		COMMERCIAL/ RETAIL													
	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	3,205.7	34,505.9	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	277.6	2,987.7	0.0	0.0	1,409.7	15,174.2	423.9	4,562.3	0.0	0.0	1,473.9	15,864.8	1,246.7	13,419.8
GF-UPPER	1,662.5	17,894.9	0.0	0.0	0.0	0.0	0.0	0.0	1,333.8	14,356.8	199.1	2,142.8	0.0	0.0	1,333.8	14,356.8	328.7	3,538.1
FLOOR 2	2,557.8	27,531.4	2,168.8	23,344.8	0.0	0.0	113.6	1,222.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,557.8	27,531.4
FLOOR 3	2,423.2	26,082.8	2,133.6	22,965.7	0.0	0.0	37.5	403.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,423.2	26,082.8
FLOOR 4	2,035.5	21,910.4	1,744.3	18,775.4	0.0	0.0	37.5	403.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,035.5	21,910.4
FLOOR 5	2,035.5	21,910.4	1,744.3	18,775.4	0.0	0.0	37.5	403.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,035.5	21,910.4
FLOOR 6	2,035.5	21,910.4	1,744.3	18,775.4	0.0	0.0	37.5	403.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,035.5	21,910.4
FLOOR 7	2,035.5	21,910.4	1,744.3	18,775.4	0.0	0.0	37.5	403.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,035.5	21,910.4
FLOOR 8	1,468.5	15,806.7	1,192.4	12,834.9	0.0	0.0	37.5	403.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,468.5	15,806.7
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	594.1	6,394.7	39.9	429.8
TOTAL	**22,814.4**	**238,747.7**	**12,471.9**	**134,246.8**	**277.6**	**2,987.7**	**338.6**	**3,644.9**	**5,473.1**	**58,912.2**	**622.9**	**6,705.1**	**0.0**	**0.0**	**3,401.8**	**30,221.6**	**16,206.9**	**174,020.2**

ABOVE GROUND GCA 19,608.7 211,066.4

LOADING AND WASTE

PROPOSED LOADING AND WASTE	
UNITS COUNT	177
LOADING SPACE REQUIREMENT	Loading Space (3.5 x 9.0 m)
STAGING AREA	17.8 m^2
WASTE STORAGE ROOM	65.64 m^2

VEHICULAR PARKING

PROPOSED VEHICLE PARKING DISTRIBUTION					
LEVEL	TYPE			COUNT	TANDEM*
	STANDARD PARKING	SMALL CARE PARKING	ACCESSIBLE PARKING		
P1	69	1	2	72	6
GF	35	3	2	40	0
GF-UPPER	32	4	2	38	0
TOTAL	136	8	6	150	6
TOTAL VEHICULAR PARKING				**150**	**156**

** incl. tandem spaces*

BICYCLE PARKING

PROPOSED BIKE PARKING			
TYPE	REQUIRED RATE	REQUIRED SPACES	PROPOSED SPACES
RESIDENTIAL			54
RETAIL			2
TOTAL			56

Issued

Description: Date:

General Notes:

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MULTI-UNIT RESIDENTIAL DEVELOPMENT

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

PROJECT STATISTICS

Project No.: 2416
Scale: NTS
Date: April 28, 2025
Drawn by:

Drawing No.:
A0.01

Unit Count & Bedroom Breakdown for FSR Calcs.

Mike Gojsic

From: Jingshu Wang <jwang@studiojci.com>
Sent: Monday, April 21, 2025 7:25 PM
To: Mike Gojsic; Laura Galati
Cc: 'Sanjam Raisuada'; Sudipto Sengupta
Subject: FW: Grimsby_ZBA1 Submission Timeline

Hi Sanjam and Mike,

Following up on this email—Please find the unit mix breakdown attached for the purpose of calculations for the report. Kindly note that this has not been updated to reflect the marketing targets.

UNIT COUNT 21-Apr-25

FLOORS	Studio	1b	2b	3b	Total
	#	#	#	#	0
GF	0	0	0	0	0
INT	0	0	0	0	0
2	1	7	12	8	28
3	1	7	15	6	29
4	4	1	16	4	25
5	4	1	16	4	25
6	4	1	16	4	25
7	4	1	16	4	25
8	3	6	11	0	20
MPH	0	0	0	0	0
Total	21	24	102	30	177
%	12%	14%	58%	17%	100%

Regards,

Jingshu Wang
M.Arch.,OAA
Jr. Project Manager

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

STUDIO JCI

From: Jingshu Wang
Sent: April 21, 2025 7:19 PM
To: Chester Rennie <crennie@svn-ap.com>; Steven Pignataro <Steven.Pignataro@bagroup.com>; Eric Cornish

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

ONSITE LOCATES INC.

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
E 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.

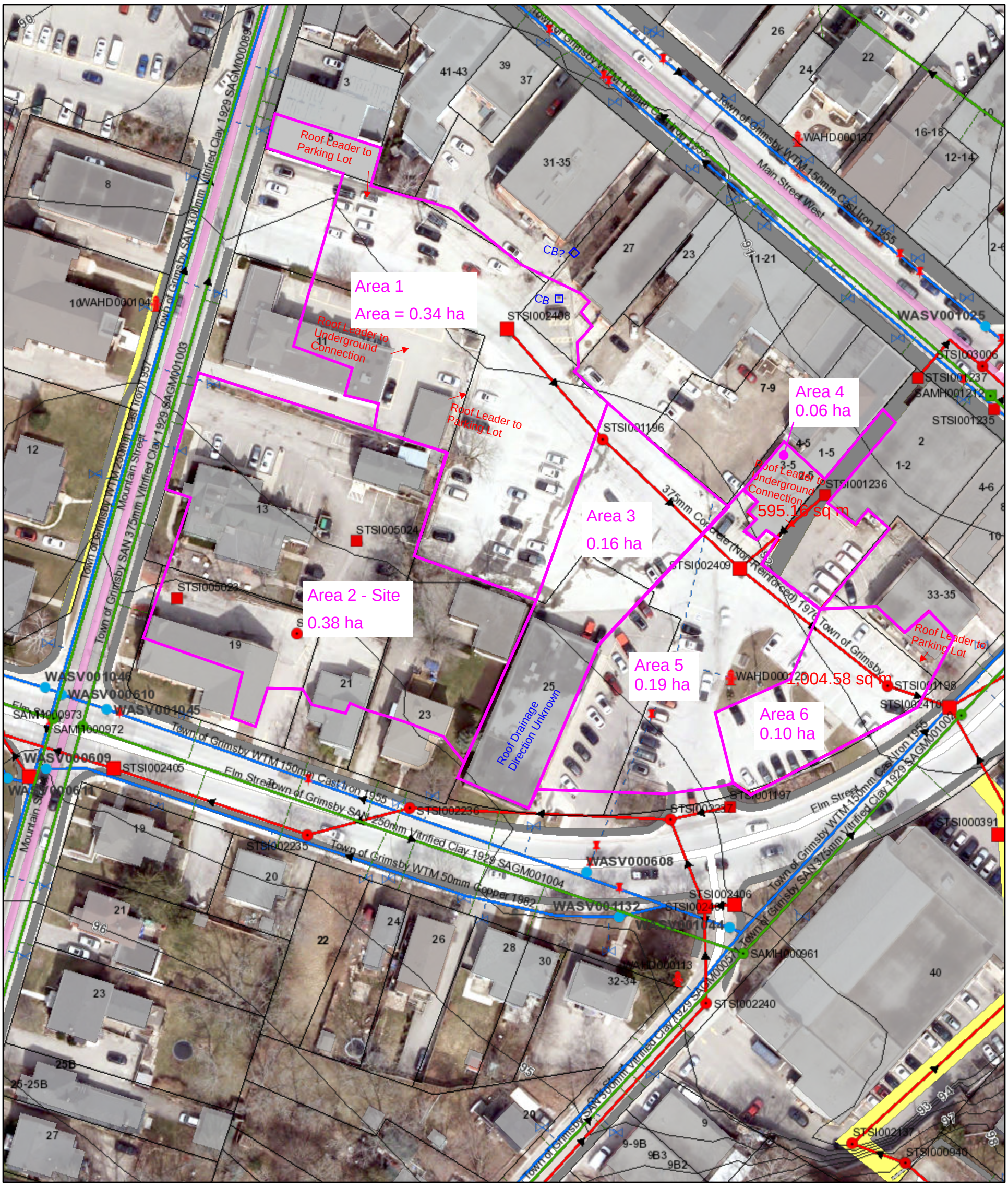
140 RENFREW DRIVE, SUITE 100, MARKHAM, ON L3R 6B3
T: 1-800-805-6155 www.onsitelocates.ca

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

FILE: \\USER8\usrl\ONSITE\21-46-31781-cctv-13\To Client\Oct21\2021-46-30678-Rev03-Oct21.dgn DATED: 2021-10-21

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

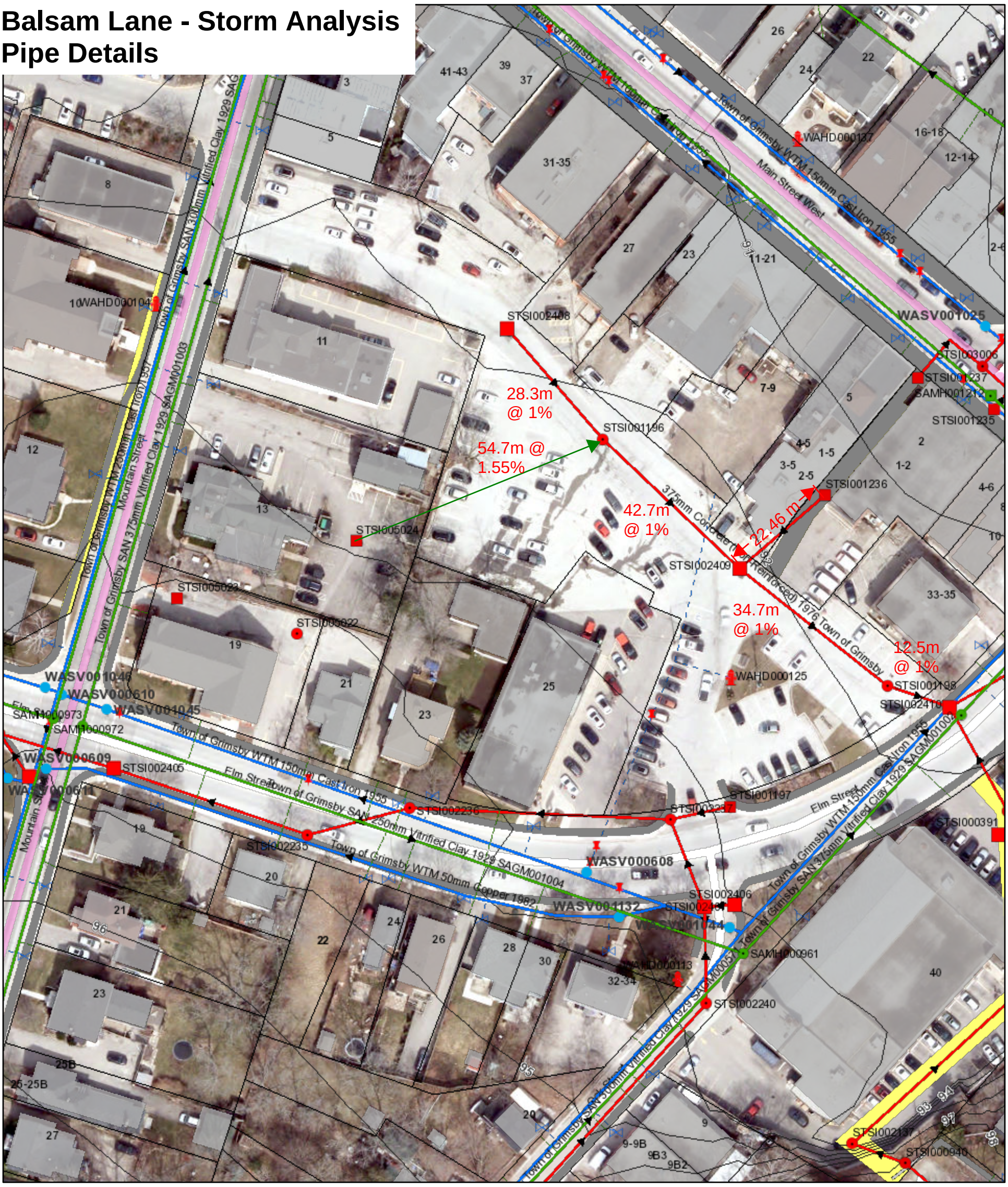
swInlet

- 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



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

1:1,128

0 50 100 200 ft

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
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- 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

BURNSIDE
[THE DIFFERENCE IS OUR PEOPLE]

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

BURNSIDE
[THE DIFFERENCE IS OUR PEOPLE]

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
C = 0.79
(2 Yr)

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		0.027	0.027	0.027	54.7	0.80	300	0.086	1.22	10.00	0.75	10.75	31%
Area 3 - Balsam Lane	STSI001196	STSI002409	0.16	0.90	0.15	0.45	65.1	0.082		0.027	0.109	42.7	1.00	375	0.175	1.59	10.75	0.45	11.19	62%
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		0.027	0.147	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		0.027	0.161	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
[THE DIFFERENCE IS OUR PEOPLE]

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
C = 0.79
(2 Yr)

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		0.052	0.052	0.052	54.7	0.80	300	0.086	1.22	10.00	0.75	10.75	60%
Area 3 - Balsam Lane	STSI001196	STSI002409	0.16	0.90	0.15	0.45	65.1	0.082		0.052	0.134	42.7	1.00	375	0.175	1.59	10.75	0.45	11.19	76%
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		0.052	0.172	34.7	1.00	375	0.175	1.59	11.19	0.36	11.56	98%
Area 6 - Balsam Lane	STSI001198	STSI002410	0.10	0.90	0.09	0.77	62.7	0.134		0.052	0.186	12.5	1.00	375	0.175	1.59	11.56	0.13	11.69	106%

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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:	May 11, 2025

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:	May 11, 2025

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** **m²** 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** **m²** 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** **m²** 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** **m²** 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** **m²**

			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: May 11, 2025

	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**
Total 2-yr Post-development flow to Balsam =	**27.1 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: May 11, 2025

	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**
Total 5-yr Post-development flow to Balsam =	**33.7 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:	May 11, 2025

	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
Total 100-yr post development flows to Balsam =	52.47	

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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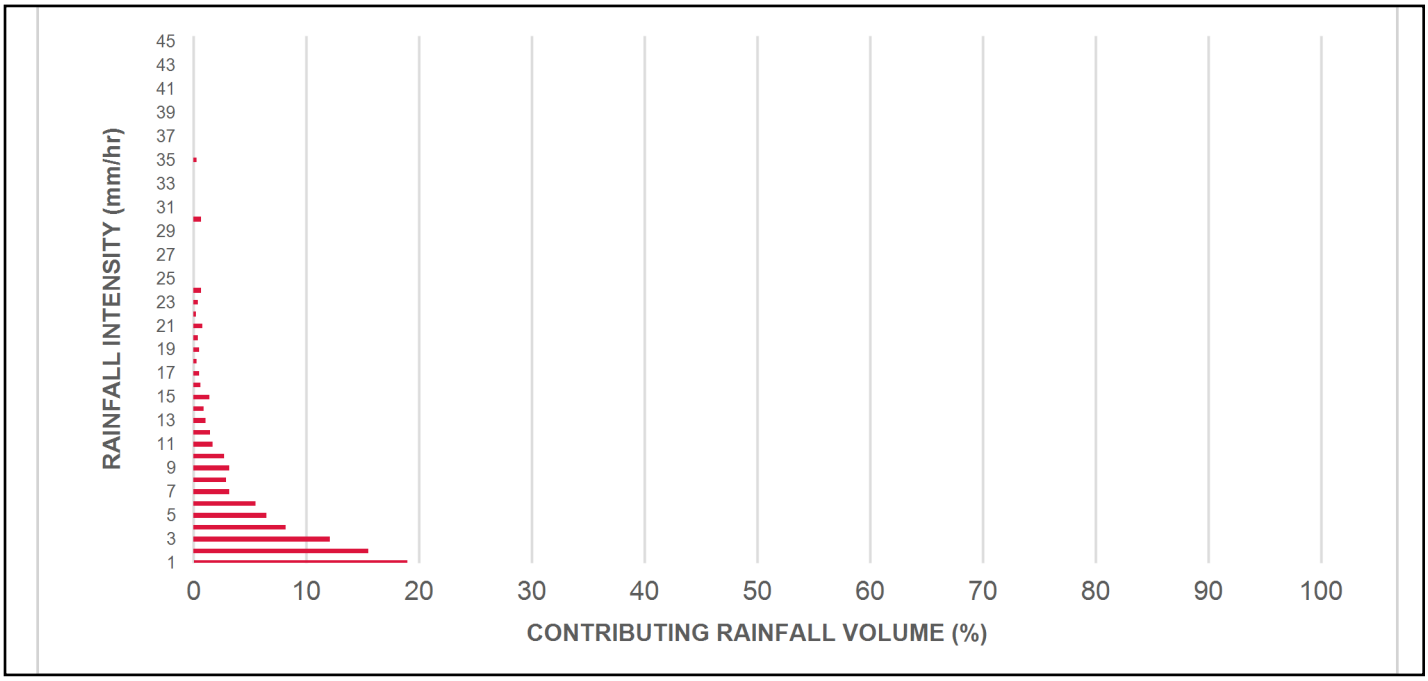
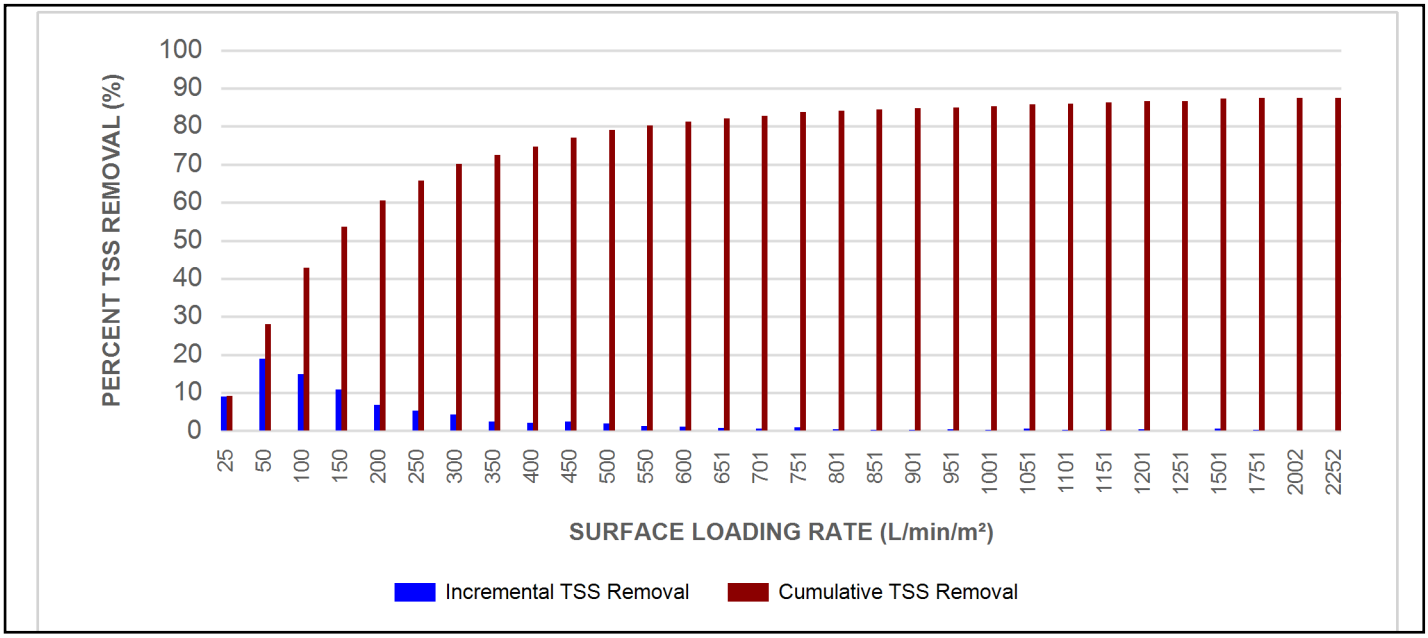
RAINFALL DATA FROM HAMILTON RBG CS RAINFALL STATION



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

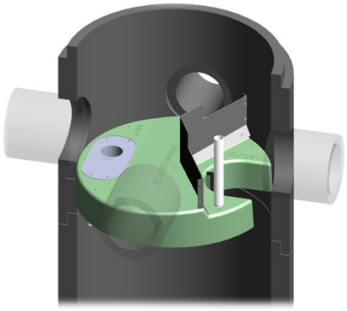
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test 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.

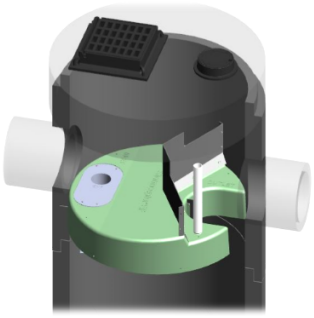
DESIGN FLEXIBILITY

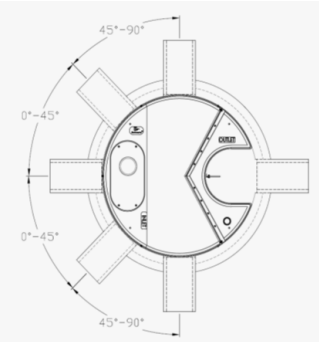
►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend 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 May 11, 2025

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=	45	1.2	54
2 & 3 Bedroom =	132	2	264
Total=	**177**		**318**

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)

$Q_{(residential)}$= 3.75 L/s

Groundwater Pump Rate

$Q_{(Peak)}$= 1.00 L/s

**Groundwater Pump Rate, based on preliminary Hydrogeological Information for Long Term Discharge of 28,500 L/day or 0.33 L/s. Refer to Preliminary Groundwater Summary information provided in this Appendix.*

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

$Q_{proposed\ total}$ = 5.02 L/s

R.J. Burnside & Associates Limited