



**CANADIAN INFRASTRUCTURE DESIGN CONSULTANTS INC.**

Business NO: 84212 0586 RT0001

# Functional Servicing Report (FSR)

1–21 John Street and 46–50 Ontario Street,

**Proposed Mixed-Use**

**Purpose-Built Rental Development**

**Town of Grimsby, Ontario**

Prepared for: Caricari Lee Architects Inc

**Prepared by: Canadian Infrastructure Design Consultants Inc. (CIDC)**

Date: January 2026



Written by: Najib Trombo. P. Eng

Checked by: Farooq Siddiqi. P. Eng



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## 1.0 Introduction

Canadian Infrastructure Design Consultants Inc. (CIDC) was retained by Sirati & Partners Consultants Ltd to prepare this Functional Servicing Report (FSR) in support of Official Plan Amendment (OPA) and Zoning By-law Amendment (ZBA) applications for the redevelopment of lands municipally known as 1–21 John Street and 46–50 Ontario Street in the Town of Grimsby (the “Site”).

In accordance with the Town of Grimsby Functional Servicing Report Terms of Reference (Rev. Dec 2022), this study addresses water supply, sanitary sewage, and stormwater drainage requirements; assesses net impacts to municipal infrastructure; and identifies required improvements and mitigation measures, where applicable.

Stormwater management is addressed under a separate Stormwater Management Report (SWM) prepared and appended to this FSR. This FSR is prepared at a functional level to support planning approvals. Detailed engineering design will be completed at the Site Plan Approval stage.

## 2.0 Site Location and Description

The Site is located within the Town of Grimsby’s downtown area, generally at the northeast corner of John Street and Ontario Street, with frontage on both roads. The Site Building Footprint area is approximately 0.77 ha and is currently occupied by low-rise residential buildings and ancillary structures.



*Figure 1 Location Map.*



The Site is generally bounded by Ontario Street to the west, John Street to the south, the Canadian National Railway (CNR) corridor to the north, and lands along Robinson Street to the east.

As per the Town of Grimsby official Plan issued in January 2025, the subject Site falls into the category of Commercial Core-Transition Area. The proposed development is also situated under the zoning schedule-13A and 13B, of the Zoning Master Plan issued by the Town of Grimsby in January 2025. It is also included in the designated Urban Settlement Area as per Land Use Plan.

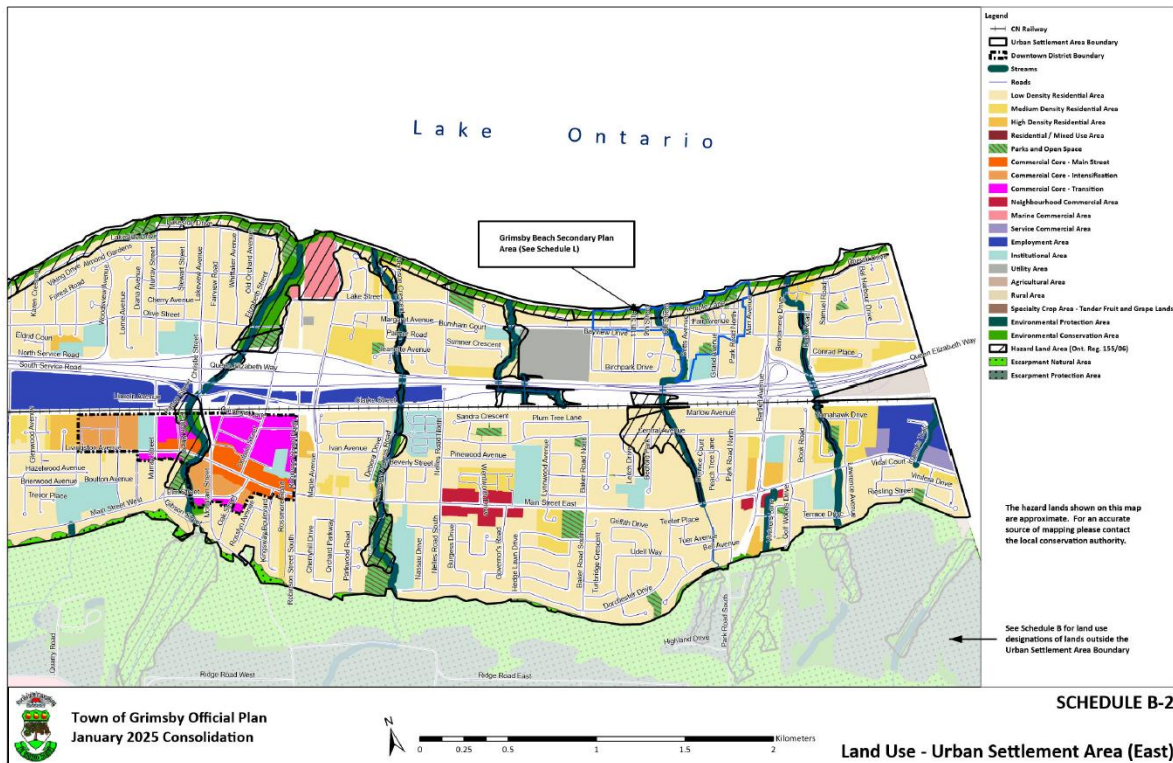


Figure 2 Land Use Urban Settlement Area ( East)Schedule B Town of Grimsby



## **2.1 Municipal Record Information (Town of Grimsby)**

Record information for existing municipal servicing infrastructure adjacent to the Site was provided by the Town of Grimsby Engineering Department. Available record drawings include the following:

- SA-49-1 – John Street Sanitary (installed circa 1949)
- SA-80-41 – Ontario Street Sanitary (installed circa 1929)
- ST-78-10E – Ontario Street Storm (installed circa 1980)
- RD-81-46H – John Street Storm (shown during road reconstruction)
- WM-Y16-69D – Watermain on John Street (updated approximately 10 years ago)
- Ontario Street Watermain – Cast iron installed circa 1955 (no record drawing available)

The Town confirmed that municipal drainage area plans are not available for the subject area. The Town also confirmed that formal hydrant flow test data is not available; however, internal hydrant flushing records were provided for information.

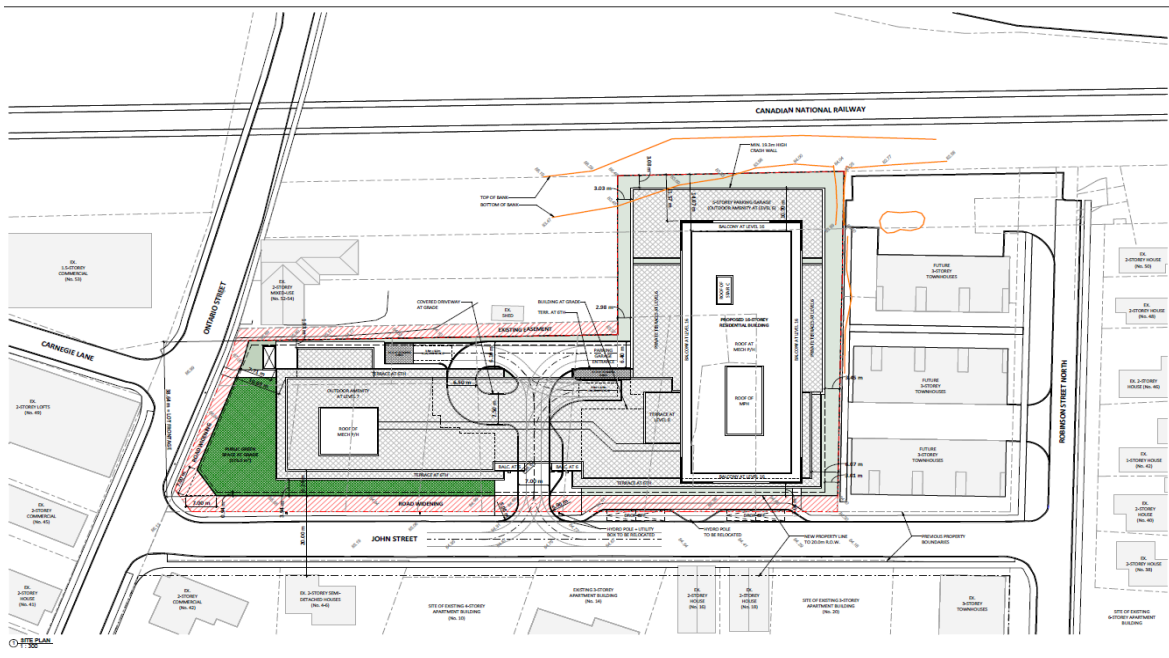
## **3.0 Proposed Development and Magnitude**

The proposed redevelopment consists of a 16-storey mixed-use, purpose-built rental residential building with a podium and underground parking, containing 305 residential units and ground-floor non-residential space (retail/commercial and office). A preliminary site design, access and servicing concept will be finalized through the Site Plan Approval process.



46, 48 + 50 ONTARIO STREET, AND 1, 3, 5, 7, 11, 13,  
15, 17 + 21 JOHN STREET

*Figure 3 Proposed Concept Plan Isometric*



*Figure 4 Proposed Concept Plan*



### 3.1 Development Statistics (Servicing Basis)

Table 3.1 Shows the Development Statistics

**Table 3.1**

<b>Item</b>	<b>Proposed</b>
Building Footprint Area	0.77 ha
Residential Units	305 (152 <b>1B</b> ; 107 <b>2B</b> ; 46 <b>3B</b> )
Residential Population (design)	581 persons
Total Non-Residential GFA (Retail + Office)	(708.06 + 1178.48) = 1886.54 m <sup>2</sup>

### 3.2 Servicing Phasing

The development is anticipated to proceed as a single phase for servicing purposes. Any interim work or sequencing requirements (e.g., temporary service connections, roadway restoration staging, or utility relocations) will be confirmed during detailed design and coordinated with the Town.

## 4.0 Water Supply and Distribution

### 4.1 Existing Water Infrastructure and Pipe Capacity Context.

Based on Town record drawing WM-Y16-69D, an existing 200 mm diameter municipal watermain is located within John Street fronting the Site. The Town has advised that this watermain was upgraded approximately 10 years ago. The watermain along Ontario Street consists of older cast iron infrastructure installed circa 1955; no record drawing is available for this segment.



At this functional Servicing stage, the proposed development is intended to be serviced from the existing John Street watermain.

Hydrant flushing records provided by the Town for the past 10 years indicate an average static pressure of approximately 99.3 psi within the local distribution system. This consistently high static pressure reflects a well-supplied distribution network and indicates that sufficient system pressure is available to support both domestic and fire flow conditions.

The total site water demand is estimated at 149 L/s, consisting of 139.87 L/s for fire flow and 9.137 L/s for domestic demand. While static pressure alone is not a direct measure of available flow, an available pressure on the order of 99.3 psi provides a strong indication that the existing 200 mm diameter municipal watermain has adequate capacity to deliver the required demand while maintaining minimum residual pressure criteria (typically 140 kPa or 20 psi during fire flow conditions).

On this basis, the existing municipal watermain is considered adequate to service the proposed development from a functional planning perspective.

Confirmation of available fire flow, residual pressures, and any Town or Region of Niagara requirements for upstream system capacity assessment will be undertaken through hydrant flow testing as part of the detailed design and Site Plan Approval process.

#### **4.2 Estimated Water Consumption (Demands).**

Domestic water demands were calculated in accordance with Niagara Region Design Criteria using 300 L/capita/day for residential and 75 L/m<sup>2</sup>/day for non-residential uses. Peaking factors of 1.5 (maximum day) and 2.5 (peak hour) were applied to average day demand. Table 4-1 Shows the Population estimation., while Table -2 shows domestic water demand calculation.



**Table 4-1: Residential Population Estimate**

<b>Unit Type</b>	<b>No. of Units</b>	<b>Occupancy (persons/unit)</b>	<b>Population (persons)</b>
1B	152	1.4	213
2B	107	2.1	225
3B	46	3.1	143
<b>Total</b>	<b>305</b>	<b>—</b>	<b>581</b>

**Table 4-2: Domestic Water Demand Calculations**

<b>Component</b>	<b>Demand Rate</b>	<b>Basis</b>	<b>ADD (L/day)</b>
Residential	300 L/cap/day	581 persons	174,300
Non-Residential (Retail + Office)	75 L/m <sup>2</sup> /day	1886.54 m <sup>2</sup>	141,491
<b>Total</b>	<b>—</b>	<b>—</b>	<b>315,791</b>

**Equation Set 4A: Domestic Demand Conversion and Peaking**

$$Q_{ADD} = (P_{res} \times 300 + A_{NR} \times 75) / 86,400$$

$$Q_{ADD} = (581 \times 300 + 1886.54 \times 75) / 86,400 = 3.655 \text{ L/s}$$

$$Q_{MDD} = 1.5 \times Q_{ADD} = 5.482 \text{ L/s}$$

$$Q_{PHD} = 2.5 \times Q_{ADD} = 9.137 \text{ L/s}$$



### 4.3 Net Impact and Distribution Concept Plan

The proposed redevelopment will result in an increase in water demand relative to existing low-rise residential uses. The water distribution concept is to provide separate domestic and fire services from the John Street watermain. Any required municipal appurtenances (valves, chambers, backflow prevention, metering arrangement) will be designed to Town and Niagara Region standards. The anticipated water servicing connection is shown in Drawing PD-2 in Appendix A, final connection approvals will be completed at Site Plan Approval stage

### 4.4 Hydrant Flow Test and Fire Flow

Fire flow requirements were estimated using the Fire Underwriters Survey (FUS) methodology. The preliminary required fire flow is estimated at 139.87 L/s. Combined fire flow plus peak hour domestic demand is summarized below.

$$RFF\_base (L/min) = 220 \times C \times \sqrt{A}$$

$$C = 1.0$$

$$A = 2,694 \text{ m}^2$$

$$\sqrt{A} = \sqrt{(2,694)} = 51.90$$

$$RFF\_base = 220 \times 1.0 \times 51.90 = 11,418 \text{ L/min}$$

$$RFF\_base = 11,418 / 60 = 190.30 \text{ L/s}$$

$$\text{Sprinkler credit} = 30\% \Rightarrow RFF\_spr = RFF\_base \times (1 - 0.30)$$

$$RFF\_spr = 190.30 \times 0.70 = 133.21 \text{ L/s}$$

$$\text{Exposure charge (East)} = 5\% \Rightarrow RFF\_final = RFF\_spr \times (1 + 0.05)$$

$$RFF\_final = 133.21 \times 1.05 = 139.87 \text{ L/s}$$

$$Q\_Total = Q\_Fire + Q\_PHD$$

$$Q\_Total = 139.87 + 9.137$$

$$Q\_Total = 149.007 \text{ L/s} \approx \mathbf{149 \text{ L/s}}$$



The Town has confirmed that formal hydrant flow test data is not currently available for the subject area. Internal hydrant flushing records were provided and reviewed for baseline system pressure context only. In accordance with Town requirements, confirmatory hydrant flow testing (static and residual pressure) will be completed by the Owner's Engineer at the detailed design / Site Plan Approval stage to verify available flow and residual pressure and to confirm compliance with the Ontario Building Code, FUS criteria, and Town standards.

## **5.0 Wastewater (Sanitary Sewage)**

### **5.1 Existing Sanitary Infrastructure and Pipe Capacity Context**

Record drawing SA-49-1 indicates an existing sanitary sewer within John Street. The Town advised that the John Street sanitary sewer was installed circa 1949. The sewer is shown as 300 mm diameter flowing easterly at an approximate slope of 1.64%. Record drawing SA-80-41 identifies sanitary infrastructure within Ontario Street installed circa 1929. No new sanitary connections are proposed to Ontario Street.

At this functional stage, capacity is reviewed based on the local sewer size/slope and estimated site discharge. Any Town/Region requirements for downstream trunk system capacity confirmation, background flow assumptions, or sanitary modeling will be addressed during detailed design.

### **5.2 Estimated Wastewater Discharge (Flows)**

Sanitary flows were estimated using Niagara Region criteria: 275 L/capita/day for average sanitary flow, Harmon peaking factor for peak sanitary flow, and an infiltration/inflow (I/I) allowance of 0.26 L/s/ha applied to the Site area. Table 5.1 shows the summary of sanitary flow.



**Table 5-1: Sanitary Flow Summary**

Parameter	Value	Notes
Total Design Population, P	734	Residential + non-residential design population
Average Sanitary Flow Rate	275 L/cap/day	Niagara Region criterion
Average Sanitary Flow, Q Average	2.336 L/s	201,850 L/day
Harmon Peaking Factor, PF	3.8826	$PF = 1 + 14 / (4 + \sqrt{(P/1000)})$
Peak Sanitary Flow. Q peak	9.069 L/s	$Q \text{ peak} = Q \text{ avg} \times PF$
I/I Allowance	0.200 L/s	$0.26 \text{ L/s/ha} \times 0.77 \text{ ha}$
Total Peak Sanitary Flow, Q total	9.2659 L/s	$Q \text{ total} = Q \text{ peak} + I/I$

**Equation Set 5A: Sanitary Flow and Peaking**

$$Q. \text{ avg} = (P \times 275) / 86,400$$

$$Q. \text{ avg} = (734 \times 275) / 86,400 = 2.336 \text{ L/s}$$

$$PF_{\text{Harmon}} = 1 + 14 / (4 + \sqrt{(P/1000)})$$

$$PF_{\text{Harmon}} = 1 + 14 / (4 + \sqrt{(734/1000)}) = 3.8826$$

$$Q \text{ peak} = Q \text{ avg} \times PF_{\text{Harmon}} = 2.336 \times 3.8826 = 9.069 \text{ L/s}$$



$$Q_{I/I} = (0.26 \text{ L/s/ha}) \times (0.77 \text{ ha}) = 0.200 \text{ L/s}$$

$$Q_{total} = Q_{peak} + Q_{I/I} = 9.069 + 0.200 = 9.269 \text{ L/s}$$

### **5.3 Capacity Review and Net Impact**

A functional hydraulic capacity review was completed for the existing 300 mm sanitary sewer on John Street using the Manning equation ( $n=0.013$ ) and the record slope  $S=1.64\%$ . The estimated practical capacity (80% full) exceeds the proposed site peak sanitary discharge.

$$Q_{300mm(full)} \approx 124 \text{ L/s.}$$

$$Q_{300mm(80\% full)} \approx 99 \text{ L/s} > Q_{total} = 9.269 \text{ L/s}$$

Accordingly, no sanitary off-site upgrades are anticipated at this functional stage. Detailed downstream capacity confirmation and final connection approvals will be completed at Site Plan Approval.

### **5.4 Sanitary Servicing Concept Plan**

A new sanitary service connection is proposed to connect the development to the existing John Street sanitary sewer. A 150 mm sanitary service is anticipated at this functional stage; final sizing, invert elevations, and connection configuration will be confirmed during detailed design in accordance with Town requirements and OPSD/OPSS. Drawing PD-2 in Appendix A show the anticipated location for connection.

## **6.0 Stormwater Drainage (Refer to SWM Report)**

Stormwater servicing and drainage design are addressed in the Stormwater Management (SWM) Report appended to this FSR. The SWM Report provides pre-development and post-development drainage area plans, storm servicing concept plan, quantity and quality control measures, and demonstrates that post-



development runoff will be appropriately controlled and conveyed in accordance with Town/Regional requirements.

The Town confirmed that municipal drainage area plans are not available for this area. The SWM Report therefore establishes site drainage limits, pre- and post-development flow paths, and any required on-site controls. Any required municipal storm connection approvals and detailed design coordination will occur at the Site Plan Approval stage.

## **7.0 Conclusions and Commitments**

Based on this functional servicing assessment and in alignment with the Town of Grimsby FSR Terms of Reference:

- Domestic water demands are estimated as: ADD = 3.655 L/s; MDD = 5.482 L/s; PHD = 9.137 L/s.
- Preliminary required fire flow is estimated as 139.87 L/s (FUS), and combined fire + peak domestic is 149 L/s.
- Total peak sanitary flow including I/I is estimated as 9.269 L/s; functional capacity review indicates adequate local sewer capacity.
- Servicing is proposed from John Street; no new water or sanitary connections are proposed from Ontario Street.
- Confirmatory hydrant flow testing (static and residual pressure) will be completed at detailed design / Site Plan Approval stage to Town requirements.
- Downstream sanitary capacity confirmation and final connection approvals will be completed at Site Plan Approval stage, including any Town/Region background flow requirements.
- Stormwater servicing and mitigation measures are provided in the appended SWM Report, including pre- and post-development drainage area plans and storm servicing concept plan.

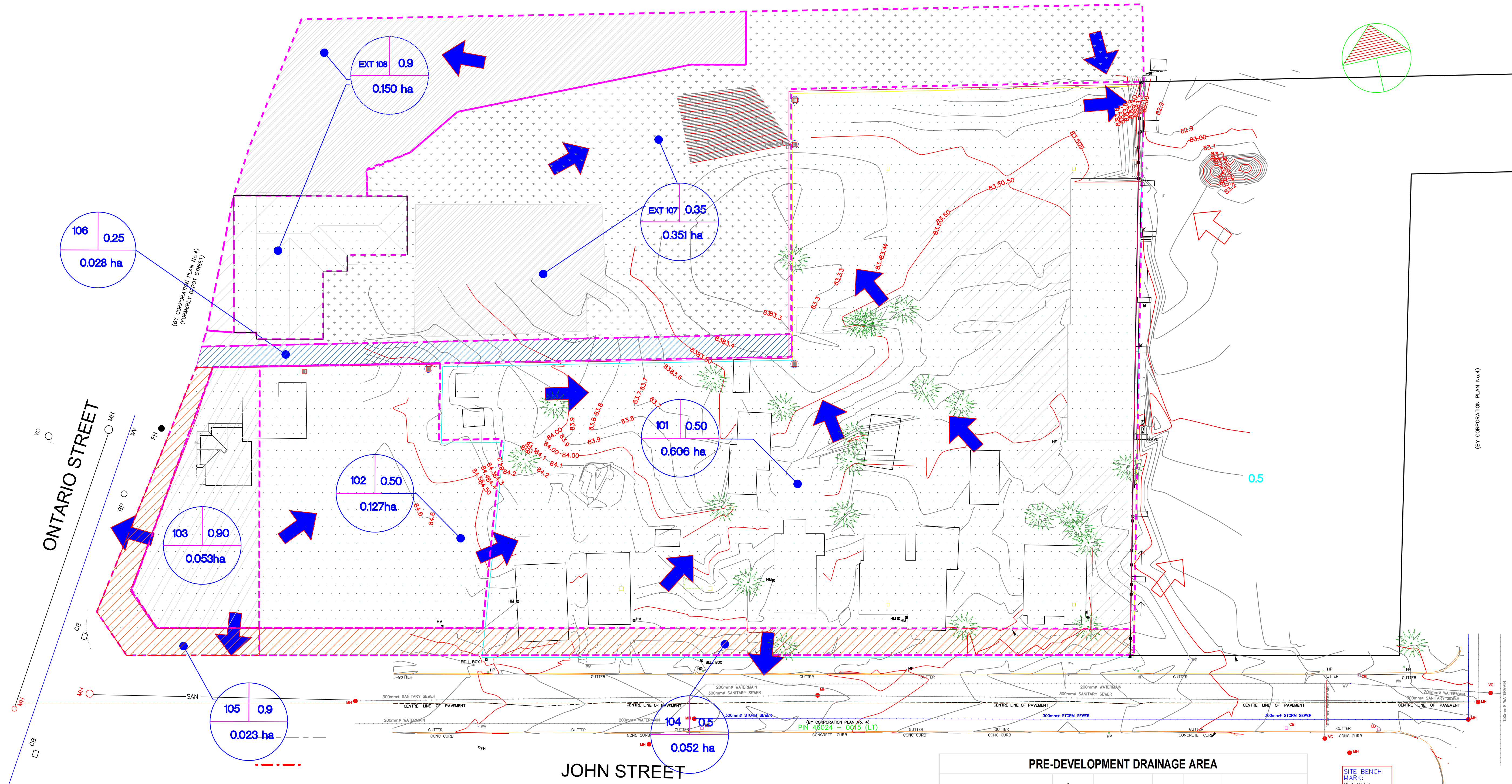


## **Appendix A**

### **Drawings**

1. PD-1          Predevelopment Drainage Plan
2. PD-2          Post Development Drainage & Servicing Plan
3. G-1            Proposed Grading Plan
4. SP-1          Servicing Plan

CANADIAN RAILWAY

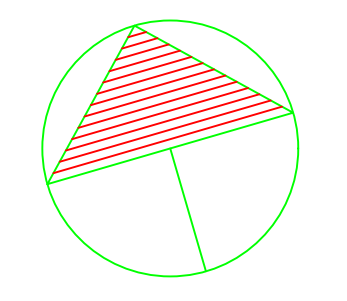


LEGEND

- PROPERTY LINE
- DRAINAGE AREA BOUNDARY
- DRAINAGE FLOW DIRECTION
- DENOTES AREA NUMBER
- DENOTES RUN-OFF COEFFICIENT
- DENOTES AREA IN HECTARES
- Asphalt/Concrete Area
- Existing buildings
- Road widening
- Easement
- Grass /Landscape Area
- Catch Basin
- Manhole
- Sanitary line
- Storm Line
- Water Line

NO.	DESCRIPTION	DATE	BY

**CIDIC** CANADIAN INFRASTRUCTURE DESIGN CONSULTANTS INC.  
 12 MANDARIN CRESCENT BRAMPTON, ONTARIO L6S 2S3  
 TEL. (905) 791-6283 TEL. (647) 300-6354



PRE-DEVELOPMENT DRAINAGE AREA

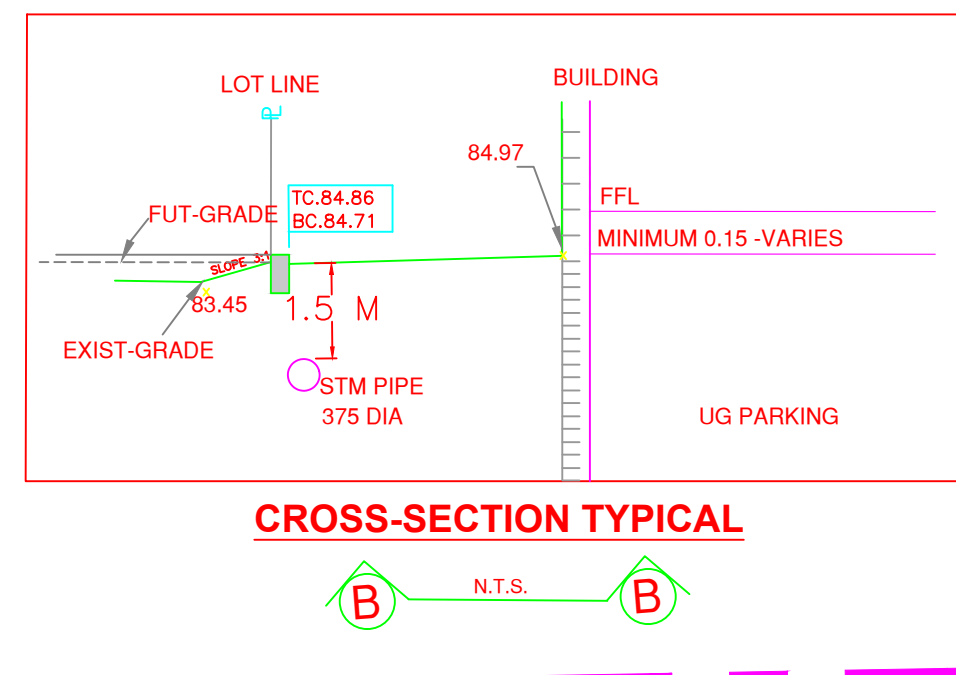
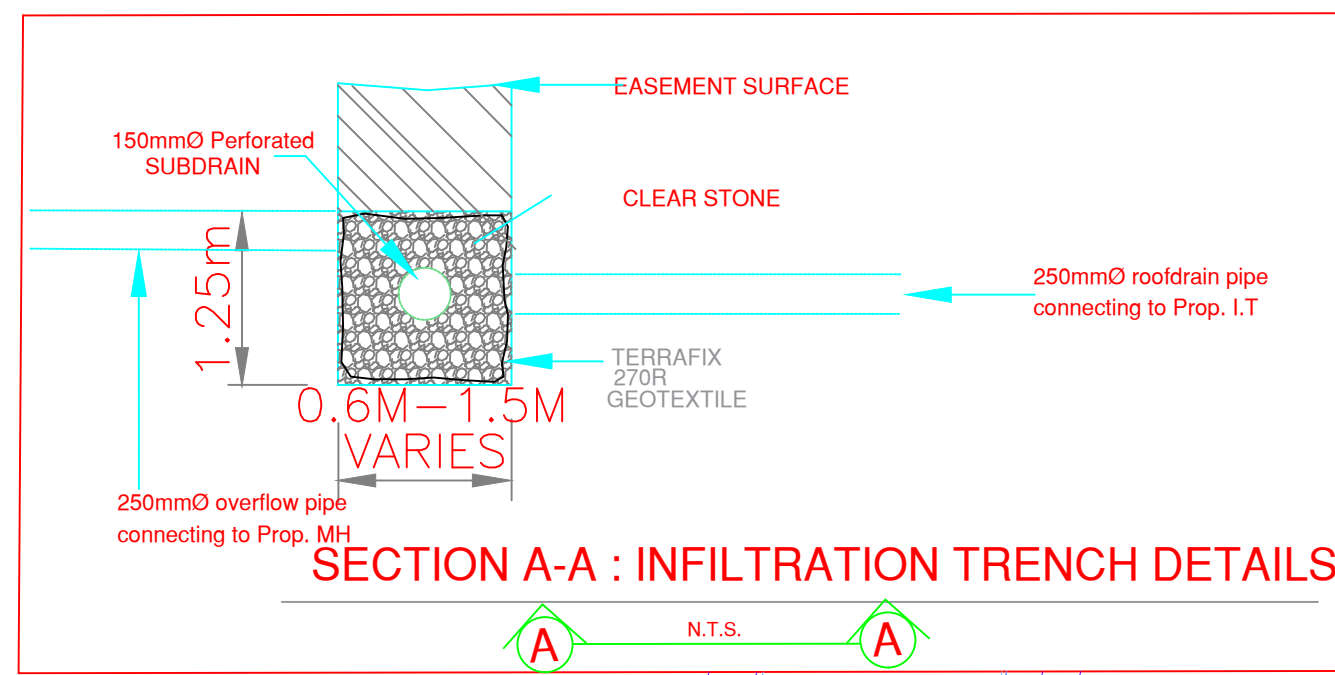
Drainage Area	Area Number	Development Area	Area ha	Area m2	Flowing To
Residential	101	Yes	0.606	6,060	North East
Residential	102	Yes	0.127	1,270	North East
Commercial	103	Yes	0.053	530	Ontario Street
Road Widening	104	Yes	0.052	520	John Street
Road Widening	105	Yes	0.023	230	Ontario /John Street
Easement	106	Yes	0.028	280	North East
Residential/Openpace	107	No	0.351	3,510	North East
Commercial	108	No	0.150	1,500	Ontario Street
<b>Total Area</b>			<b>1.390</b>	<b>13,900</b>	
<b>Development Area</b>			<b>0.889</b>	<b>8,890</b>	Check
<b>External Area</b>			<b>0.501</b>	<b>5,010</b>	0.000

6, 48 + 50 ONTARIO STREET  
 1, 3, 5, 7, 11, 13  
 & 15, 17 + 21 JOHN STREET

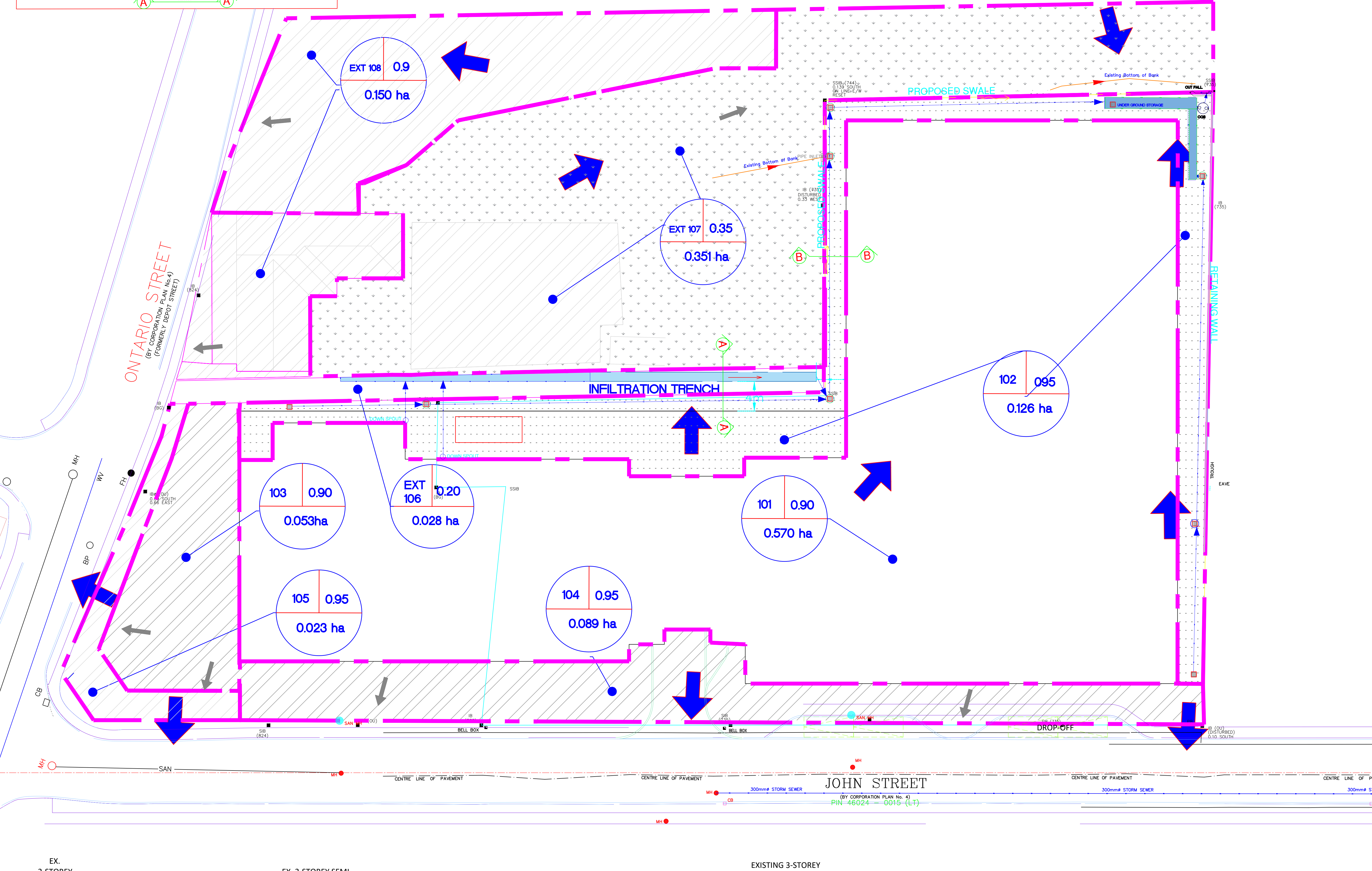
**JOHN STREET APARTMENTS**  
**TOWN OF GRIMBSBY**  
**ONTARIO**

SHEET TITLE:  
**PRE-DEVELOPMENT DRAINAGE PLAN**

DRAWN BY: K.B. PROJECT No: 26-01  
 CHECKED BY: F.S. DRAWING No.  
 SCALE: 1:1000 **PD-1**  
 DATE: DEC 2025



CANADIAN NATIONAL RAILWAY



- LEGEND:**
- UN CONTROLLED DRAINAGE AREAS
  - CONTROLLED AREAS (HARD SURFACE)
  - UNCONTROLLED AREAS OPEN SPACE
  - CONTROLLED AREAS (BUILDING)
  - DRAINAGE AREA FLOW DIRECTION
  - DENOTES AREA NUMBER
  - DENOTES RUN-OFF COEFFICIENT
  - DENOTES AREA IN HECTARES
  - U-G STORM STORAGE TANK - CONCRETE
  - PROPOSED SANITARY SEWER
  - PROPOSED STORM SEWER
  - PROPOSED MANHOLE CATCHBASIN
  - PROPOSED CATCHBASIN
  - PROPOSED DOUBLE CATCHBASIN
  - INFILTRATION TRENCH
  - PROPOSED SWALE
  - OVERLAND FLOW

**TOPO INFO:**  
 TOPOGRAPHIC INFORMATION TAKEN FROM DRAWING PREPARED BY AT McLAREN LTD. ONTARIO LAND SURVEYORS DATED JULY 17 2024, DRAWING No. 37768

**BENCHMARK INFO:**  
 SITE BENCH MARK: CUT STAKE ON THE SIDE WALK AT SW CORNER INTERSECTION OF ROBINSON STREET AND JOHN STREET ELEV. = 84.02 m

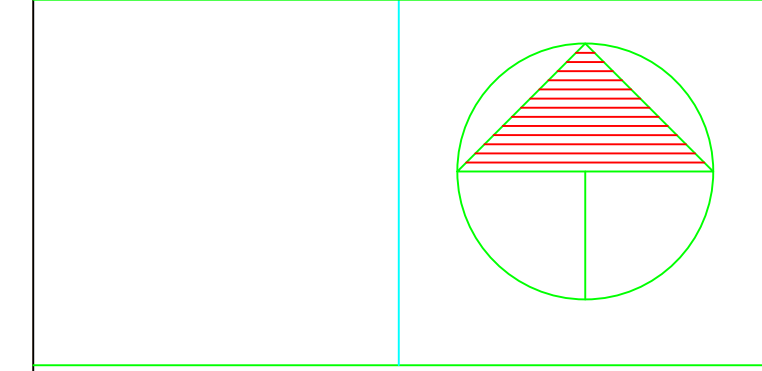
NO.	DESCRIPTION	DATE	BY

**REVISIONS**

**CIIC** CANADIAN INFRASTRUCTURE DESIGN CONSULTANTS INC. CONSULTING ENGINEERS

12 MANDARIN CRESCENT TEL: (905) 791-6283

BRAMPTON, ONTARIO L6S 2S3 TEL: (647) 300-6354



6, 48 + 50 ONTARIO STREET  
 1, 3, 5, 7, 11, 13  
 & 15, 17 + 21 JOHN STREET

JOHN STREET APARTMENTS  
 TOWN OF GRIMBSBY  
 ONTARIO

**SHEET TITLE:**  
 POST-DEVELOPMENT DRAINAGE PLAN

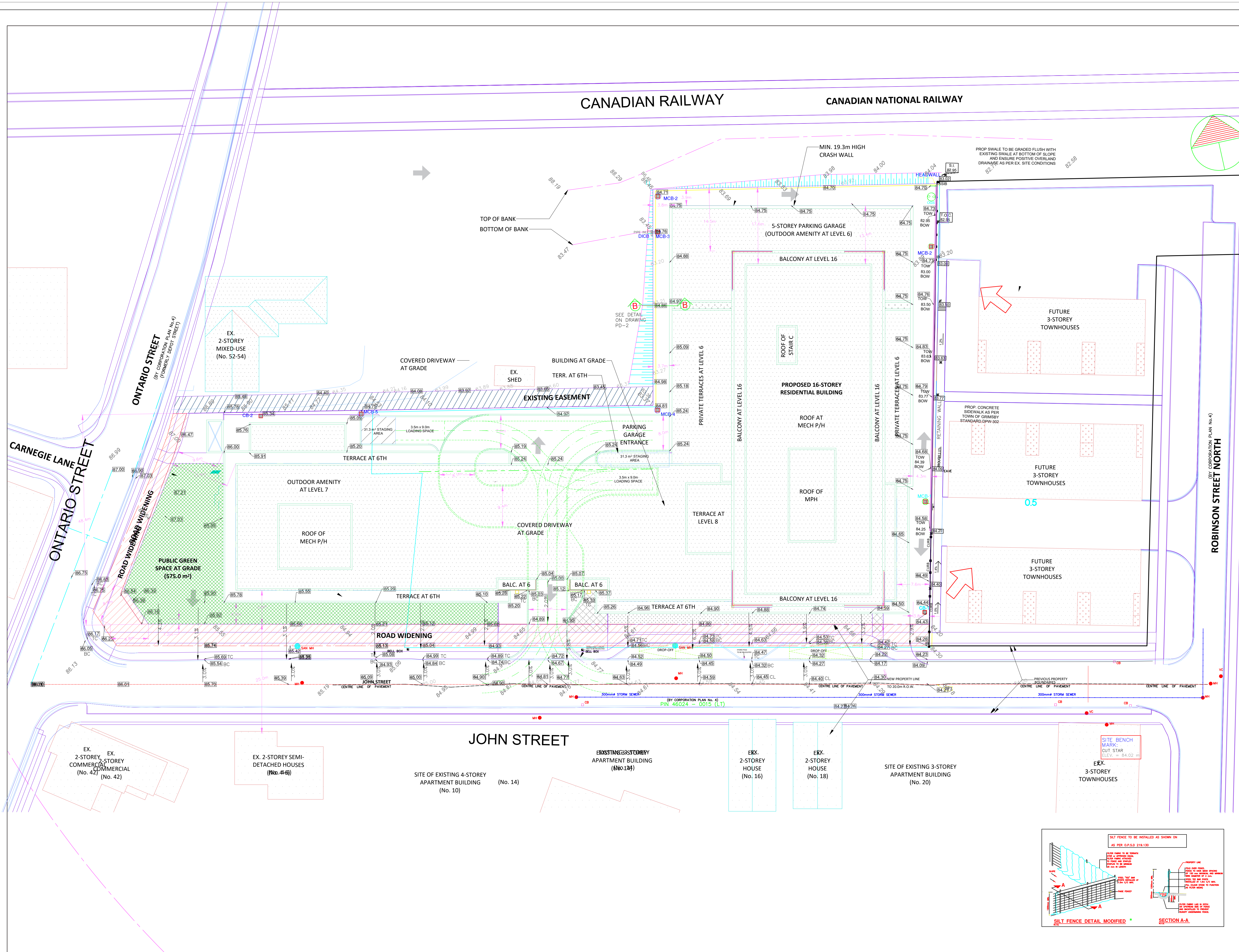
**DRAWN BY:** K.B. **PROJECT No.:** 26-01

**CHECKED BY:** F.S. **DRAWING No.:**

**SCALE:** 1:1000 **PD-2**

**DATE:** APRIL 2025

EXISTING 3-STORY



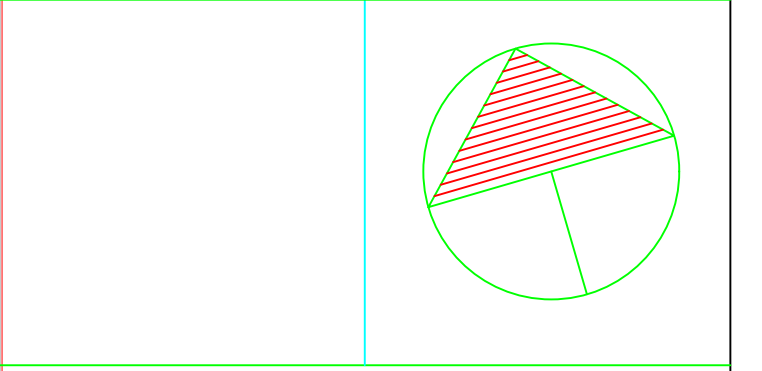
### LEGEND

- 84.41 EXISTING GRADE
- DRAINAGE FLOW DIRECTION
- Building Area
- Existing buildings
- Road widening
- Easement
- HARD /Landscape Area
- Catch Basin
- Proposed-San-Manhole
- 84.2 PROPOSED GRADES
- 84.29 TOP RETAINING WALL
- 83.63 BOTTOM RETAINING WALL
- 84.2 PROPOSED GRADES

NO.	DESCRIPTION	DATE	BY

### REVISIONS

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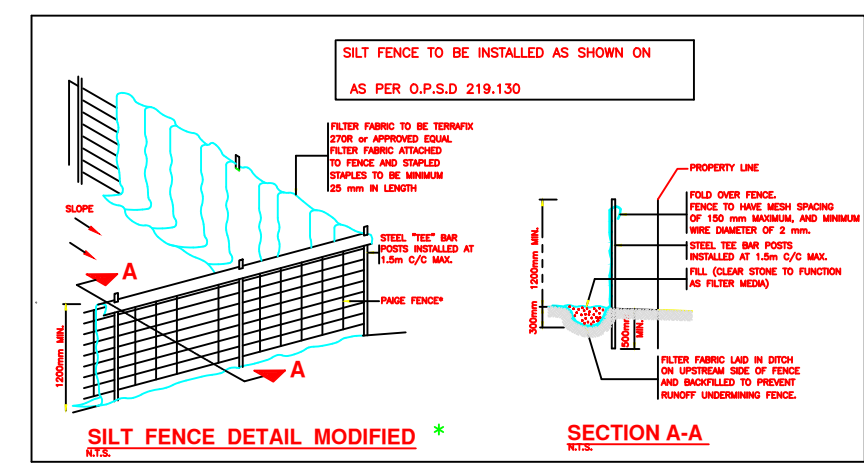


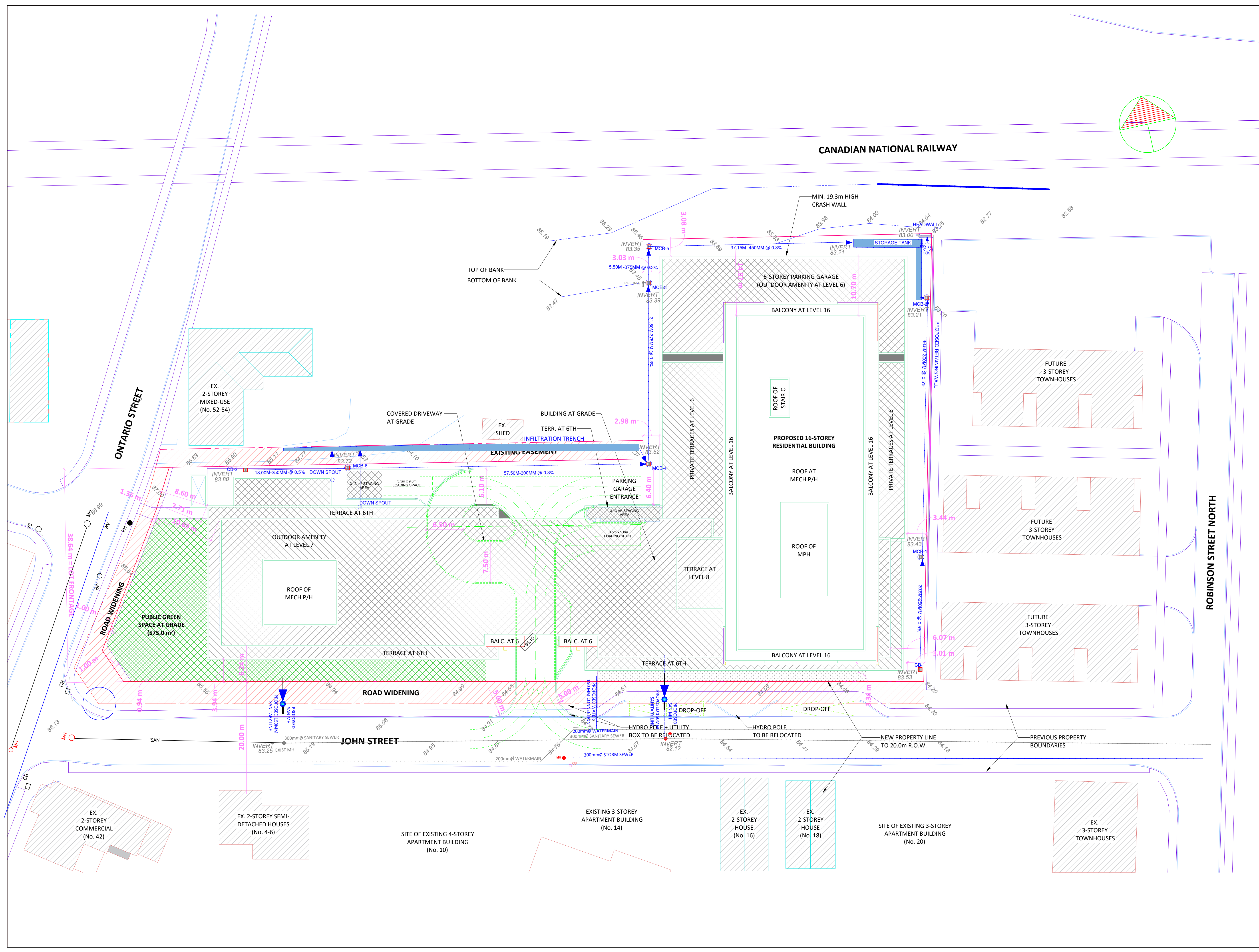
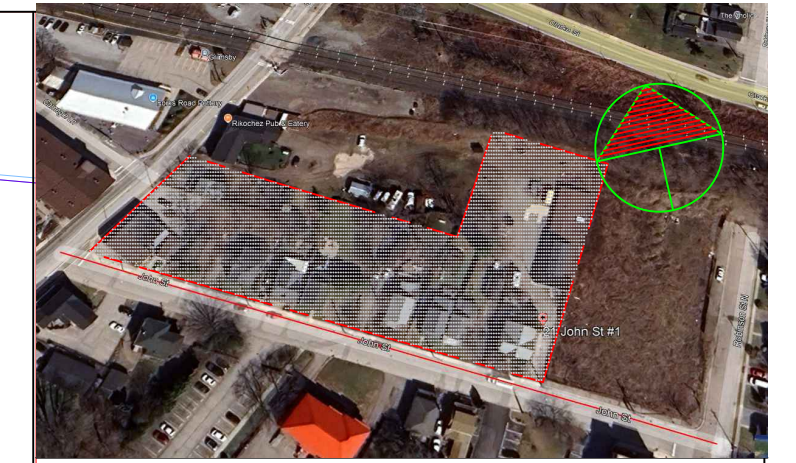
6, 48 + 50 ONTARIO STREET  
 1, 3, 5, 7, 11, 13  
 & 15, 17 + 21 JOHN STREET

**JOHN STREET APARTMENTS**  
**TOWN OF GRIMSBY**  
**ONTARIO**

SHEET TITLE:  
**PROPOSED GRADING PLAN**

DRAWN BY: **K.B.** PROJECT No: **26-01**  
 CHECKED BY: **F.S.** DRAWING No:  
 SCALE: **1:1000**  
 DATE: **DEC 2025**





CANADIAN NATIONAL RAILWAY

ONTARIO STREET

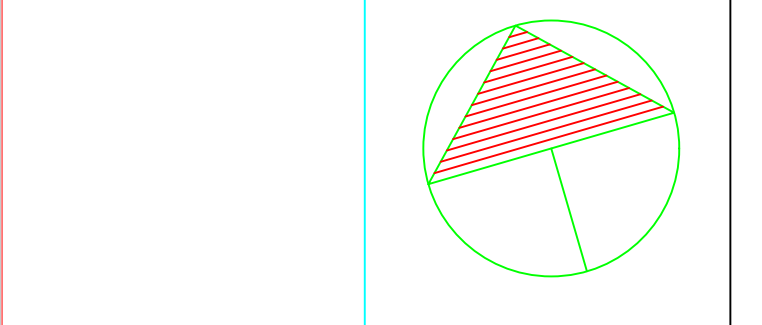
ROBINSON STREET NORTH

JOHN STREET

- PROP MHC/B / CB
- EXIST WATER LINE
- PROP WATER LINE
- PROP STORM PIPE
- PROP SAN MH
- PROP SANITARY
- EXIST STORM MH
- EXIST STORM CB
- EXIST SAN MH
- EXIST GRADE

NO.	DESCRIPTION	DATE	BY

**CIDIC** CANADIAN INFRASTRUCTURE DESIGN CONSULTANTS INC.  
 12 MANDARIN CRESCENT BRAMPTON, ONTARIO L6S 2S3  
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6, 48 + 50 ONTARIO STREET  
 1, 3, 5, 7, 11, 13  
 & 15, 17 + 21 JOHN STREET

**JOHN STREET APARTMENTS**  
**TOWN OF GRIMSBY**  
**ONTARIO**

**SHEET TITLE:**  
**SERVICING PLAN**

<b>DRAWN BY:</b> K.B.	<b>PROJECT No:</b> 26-01
<b>CHECKED BY:</b> F.S.	<b>DRAWING No.</b>
<b>SCALE:</b> 1:1000	<b>SP-1</b>
<b>DATE:</b> APRIL 2026	



## **Appendix B**

### **Received from Town of Grimsby**

WM-Y16-69D      Drawing-John Street

SA-49-1          Drawing-John Street

SA-80-41        Drawing-Ontario Street

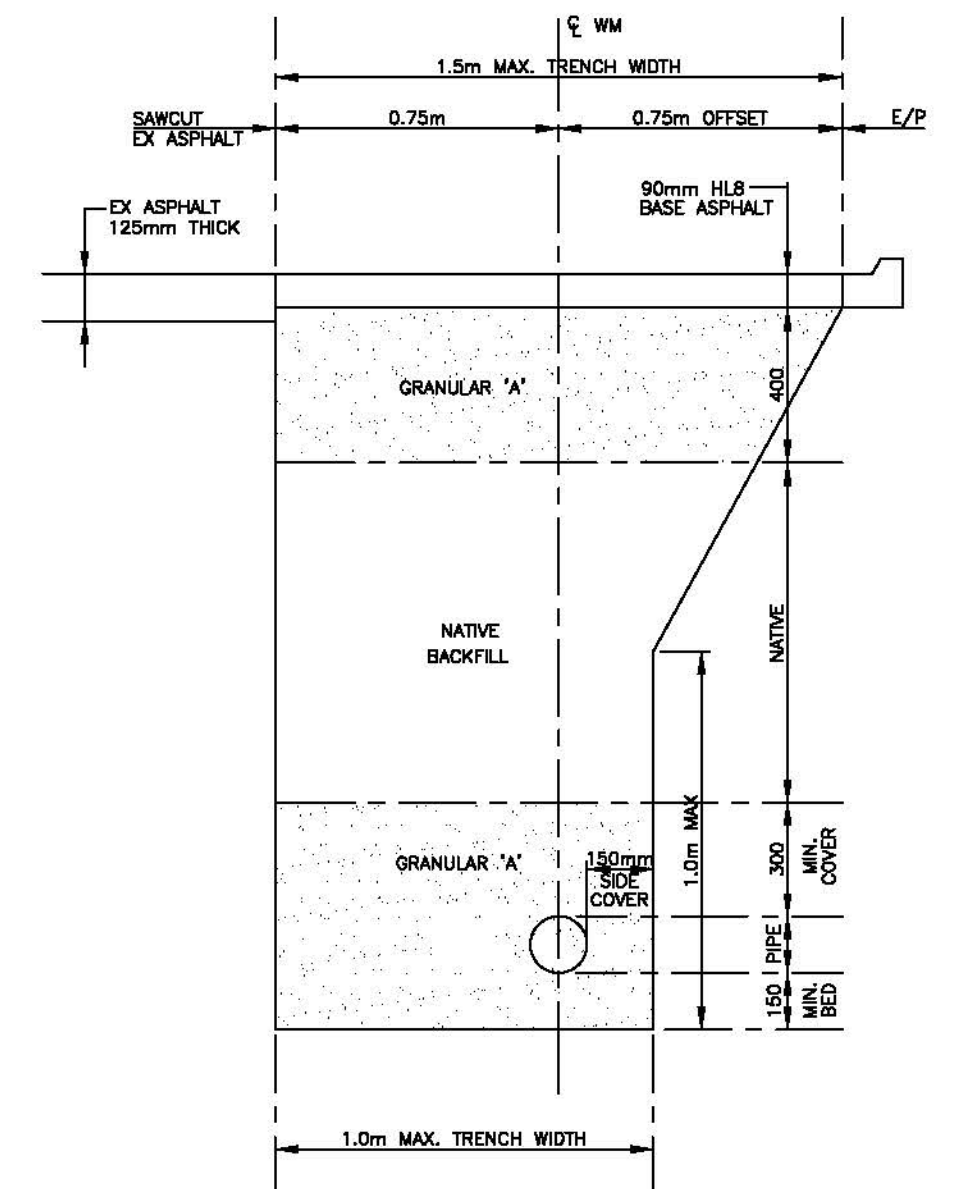
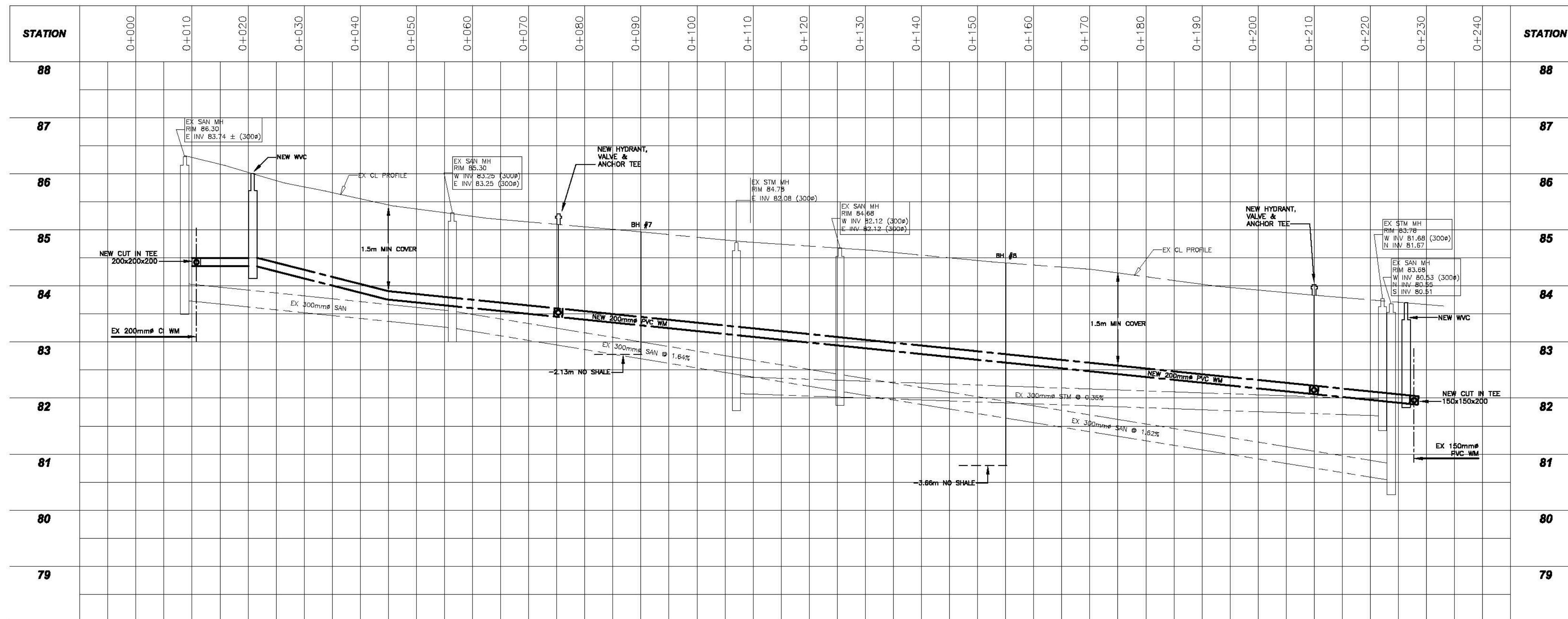
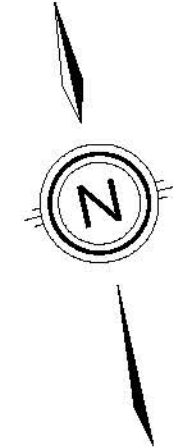
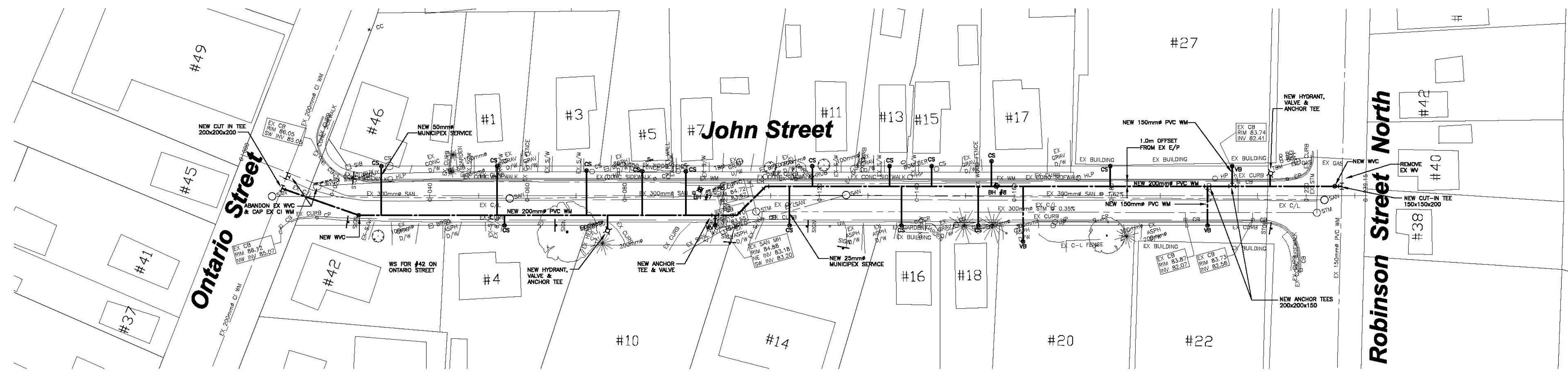
ST-78-10E      Drawing-Ontario Street

RD-81-46H      Drawing-John Street

Town Hydrant Flushing Records -John Street

Town Hydrant Flushing Records -Ontario Street

CONTRACTOR TO ALLOW FOR GAS MAINS  
LOCATED 600mm FROM PROPERTY LINES



TRENCH & RESTORATION DETAIL  
JOHN ST.  
SCALE = 1 : 20

NO.	REVISION	DATE	INIT.
3	AS CONSTRUCTED RECORD	2015-11-25	W.M.
2	ISSUED FOR TENDER	2015-03-17	W.M.
1	ISSUED FOR TOWN REVIEW	2015-02-06	W.M.

**NOTES/LEGEND**  
 1 THE POSITION OF POLE LINES, CONDUITS, WATERMANS, SEWER AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS AND, WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.  
 2 PROPERTY LINES WERE PLOTTED USING REGISTERED PLANS AND BARS LOCATED IN THE FIELD. TO VERIFY THE ACCURACY OF THESE PROPERTY LINES, A LEGAL SURVEY SHOULD BE PERFORMED PRIOR TO CONSTRUCTION.

DRAFTING  
D.R.  
DESIGN  
W.M.  
CHECKED BY  
W.M.  
APPROVED BY  
W.M.

STAMP:

**William Mackack**  
 Engineering Services  
 6572 January Drive, Niagara Falls, ON L2J 4J4

MUNICIPALITY:  
  
**TOWN OF GRIMSBY**  
 ENGINEERING  
 DEPARTMENT OF PUBLIC WORKS

**CONTRACT No. PWC 15-06-440034**  
**2015 WATERMAIN REPLACEMENT PROJECT**  
 John St.  
 from Ontario St. to Robinson St.  
 TOWN OF GRIMSBY  
 PLAN & PROFILE

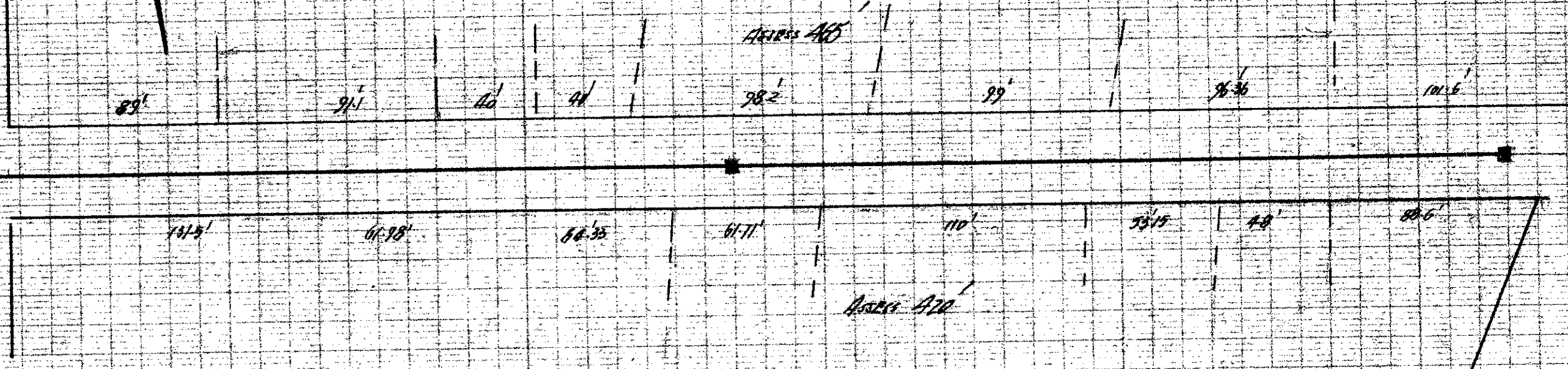
CONSULTANT FILE No. 14-050	REV.
DATE 2015-11-25	3
SCALE Hor : 1:500 m Ver : 1:50 m	
REF. No.	
DWG No. 14-050-04	

SA-49-1

ROBINSON ST

JOHN ST

DEPOT ST



660 LFT 12" <sup>OR CONCRETE</sup> K.P.P. WITH 3" CONCRETE ENVELOPE  
 28' 12" x 6" JS  
 2 H.H.S.



660 LFT 12" Sewer Slope 1%

275

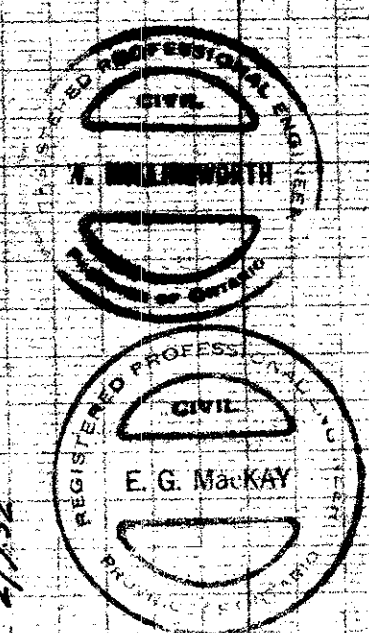
250

225

200

272.82  
 274.13  
 276.27  
 277.07  
 277.21  
 278.27  
 279.52

281.83  
 283.07



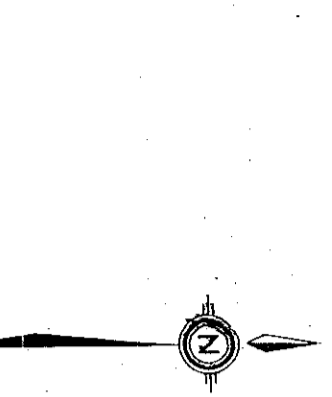
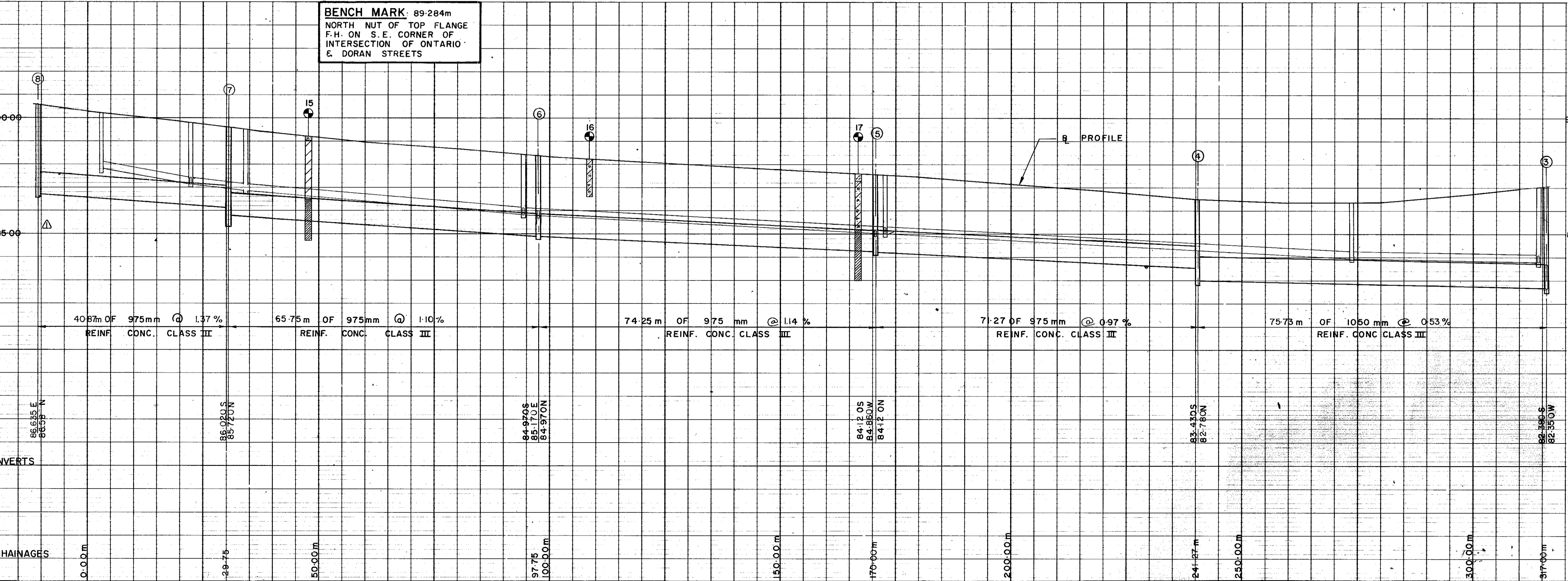
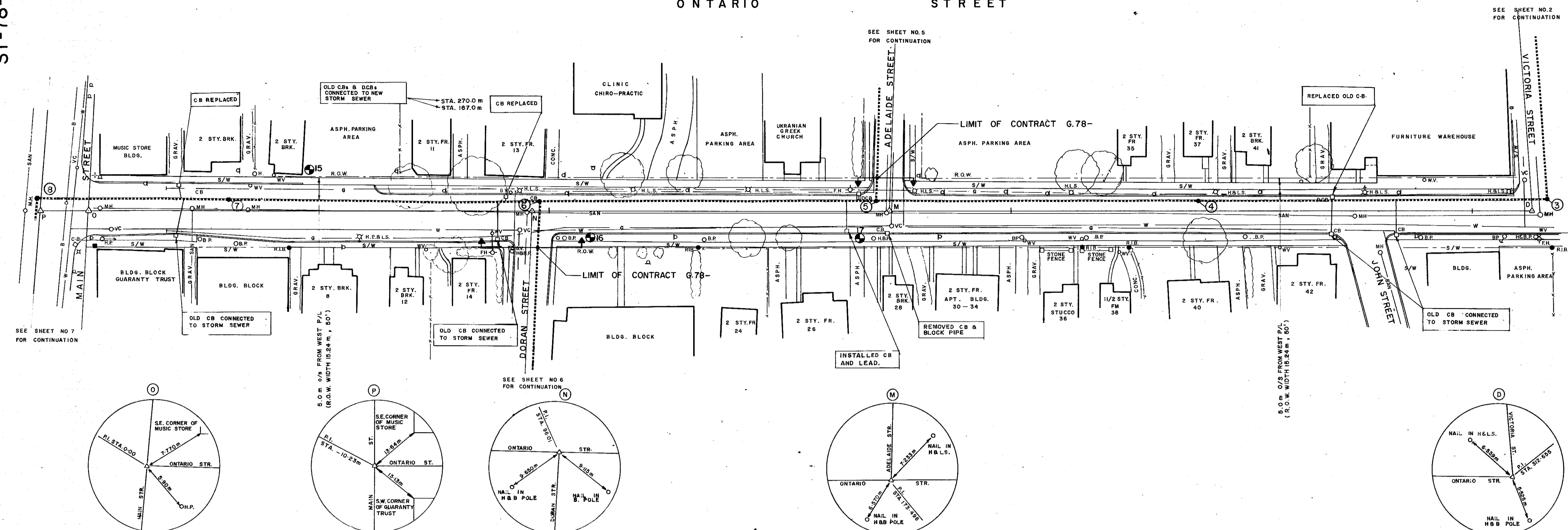
281.83  
 283.07  
 of John Street on Mill

TOWN OF GRIMSBY  
 JOHN ST SEWER  
 SCALES HOR. 50' = 1"  
 VERT. 10' = 1"  
 Mackay MacKay  
 ENGINEERS & SURVEYORS  
 HAMILTON AUG. 12, 1949  
 W.H. 10



ST-78-10E

ONTARIO STREET



Note  
ALL WATER SERVICES ACROSS THE  
STORM SEWER ARE INSULATED  
WITH 4" STYROFOAM

No.	REVISIONS TO DRAWING	BY	DATE	APPR
2	AS CONSTRUCTED	L.P.	MARCH, 79	
1	Extend sewer at mh 8	G.G.	AUG 8/78	GG
APPROVED FOR CONSTRUCTION				JUNE 1978

CLIENT  
**TOWN OF GRIMSBY**

MUNICIPALITY

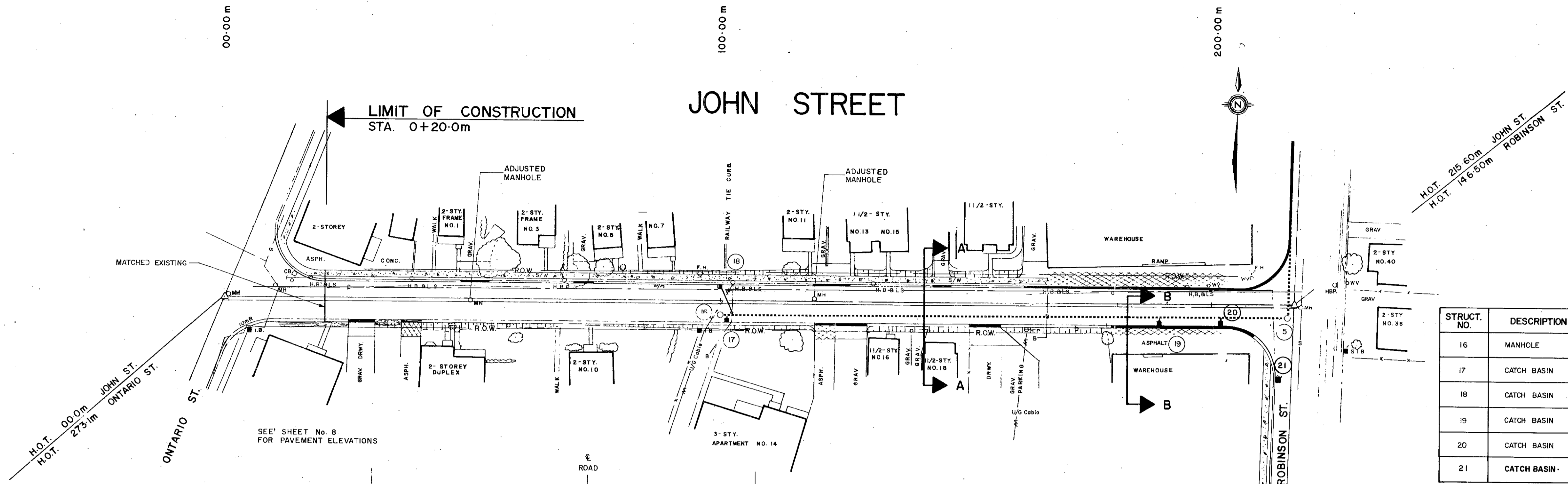
PROJECT  
**STORM SEWER SEPARATION  
PHASE II**

SHEET TITLE  
**ONTARIO STREET**

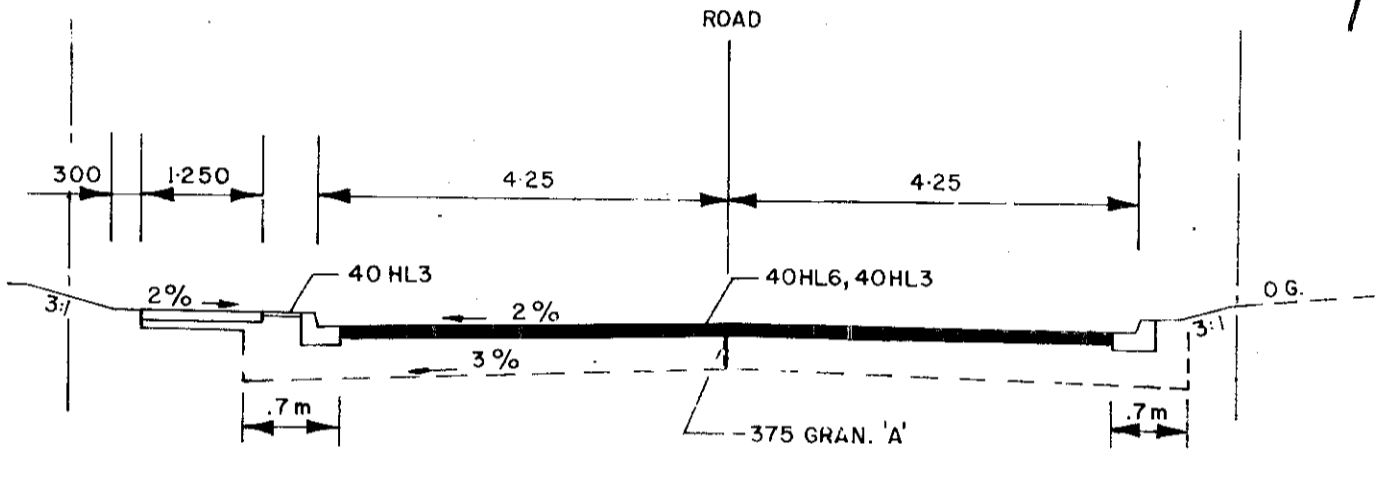
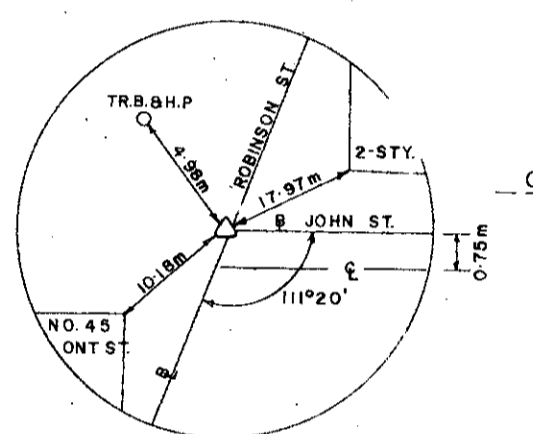
**WILLIAM L. SEARS  
AND ASSOCIATES LIMITED**  
CONSULTING PROFESSIONAL ENGINEERS  
STONEY CREEK ONT.

DESIGNED BY G. G.	DRAWN BY M. M.	CHECKED BY G. G.
SCALE HORIZ. 1: 500 VERT. 1: 100		DATE NOV. 1977.
PROJECT No. <b>G. 78-4</b>	JOB No. <b>77-20</b>	SHEET <b>3</b>

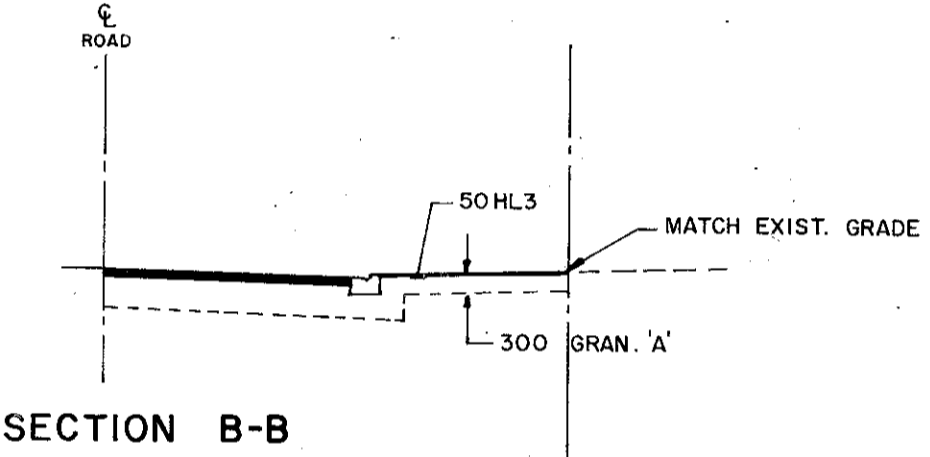
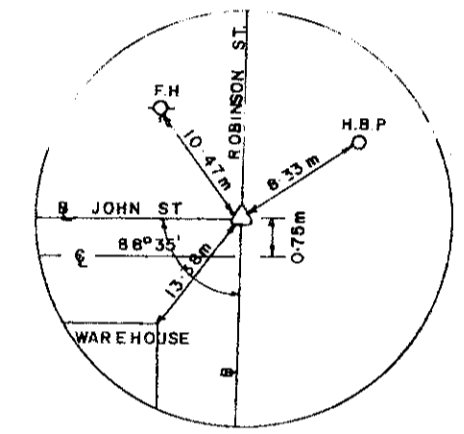
RD-81-46H



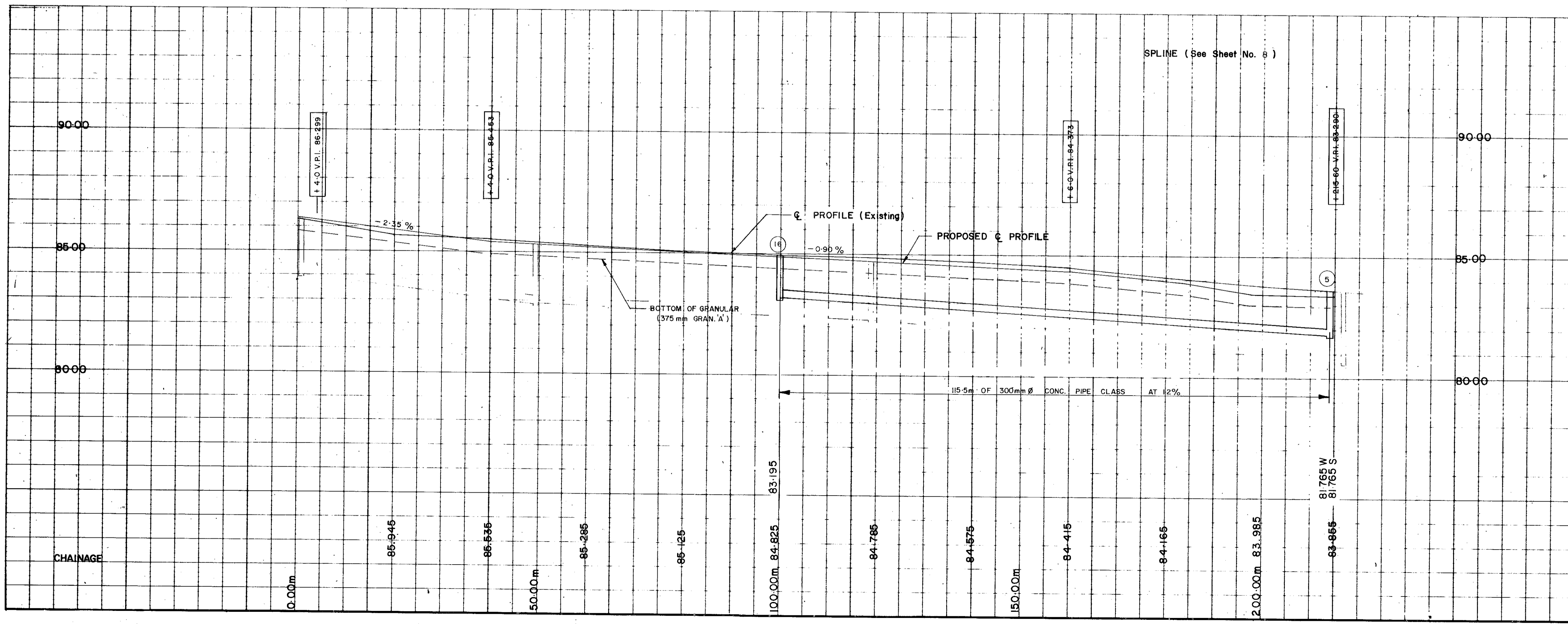
STRUCT. NO.	DESCRIPTION	STRUCTURE TYPE	GRATE TYPE
16	MANHOLE	DD-701-B	DD-704-B
17	CATCH BASIN	DD-702-A	DD-713-B
18	CATCH BASIN	DD-702-A	DD-713-B
19	CATCH BASIN	DD-702-A	DD-713-B
20	CATCH BASIN	DD-702-A	DD-713-B
21	CATCH BASIN	DD-702-A	DD-713-B



SECTION A-A  
N.T.S.



SECTION B-B  
N.T.S.



No	REVISIONS TO DRAWING	BY	DATE	APPR
2	AS-CONSTRUCTED	RAB	OCT.22/81	EC
1	ADDED DEPRESSED TYPE CURBS	CDS	JULY 10/81	EC

APPROVED FOR CONSTRUCTION

CLIENT  
TOWN OF GRIMSBY

MUNICIPALITY

PROJECT  
GRIMSBY ROAD RECONSTRUCTION

SHEET TITLE  
JOHN STREET  
NEW CONSTRUCTION  
WILLIAM L. SEARS  
AND ASSOCIATES LIMITED  
CONSULTING PROFESSIONAL ENGINEERS  
STONEY CREEK ONT.



DESIGNED BY G.G.	DRAWN BY MJS	CHECKED BY E.C. & G.G.
SCALE HORIZ. 1"=50'	DATE JAN 1980	
VERT. 1"=100'		
PROJECT NO. P.W. 81-2	JOB NO. 8013	SHEET 7

HYDRANT\_Flushing

Free Chlorine Measured	Flush Time	Date	Static Pressure	OIC	Operator 1	Operator 2	Water Used	Hydrant
1.09	5	6/17/2025	98	M. Ostaszewicz	G.Pattmore		4687	HYD-13-079
0.96	5	6/6/2024	96	M. Ostaszewicz	D. Smith	G.Pattmore	4809	HYD-13-079
0.97	5	6/6/2023	94	M. Ostaszewicz	C. George	M. Chrystian	3951	HYD-13-079
1.01	5	6/16/2022	102	B. Campbell	D. Smith	M. Chrystian	4164	HYD-13-079
0.99	5	6/7/2021	100	M. Ostaszewicz	D. Smith	S. Emery	4498	HYD-13-079
0.98	5	6/2/2020	103	M. Ostaszewicz	P. Mason			HYD-13-079
1.13	5	6/10/2019	100	M. Ostaszewicz	M. Chrystian	D. Bannister	4301	HYD-13-079
1.06	5	6/14/2018	100	M. Ostaszewicz	M. Chrystian		4164	HYD-13-079
1.06	5	6/14/2017	100	M. Ostaszewicz	S. Wilson		4301	HYD-13-079
0.95	5	6/6/2016	100	B. Campbell	M. Chrystian		4301	HYD-13-079

## HYDRANT\_Flushing

Free Chlorine Measured	Flush Time	Date	Static Pressure	OIC	Operator 1	Operator 2	Water Used	Hydrant
0.97	5	6/16/2025	100	D. Smith	G.Pattmore		3802	HYD-13-006
0.89	5	6/6/2024	100	M. Ostaszewicz	D. Smith	G.Pattmore	4809	HYD-13-006
1.01	5	6/5/2023	100	M. Ostaszewicz	C. George	M. Chrystian	3951	HYD-13-006
0.95	5	6/15/2022	102	M. Ostaszewicz	D. Smith	S. Wilson	4809	HYD-13-006
0.99	5	6/7/2021	96	M. Ostaszewicz	D. Smith	S. Emery	4498	HYD-13-006
0.97	5	6/1/2020	101	M. Ostaszewicz	P. Mason		4164	HYD-13-006
0.95	5	6/10/2019	110	M. Ostaszewicz	M. Chrystian	D. Bannister	4164	HYD-13-006
1.08	5	6/14/2018	100	M. Ostaszewicz	M. Chrystian		4164	HYD-13-006
0.96	5	6/13/2017	98	M. Ostaszewicz	P. Mason	S. Wilson	4164	HYD-13-006
0.95	4	6/6/2016	98	B. Campbell	M. Chrystian		3332	HYD-13-006
0.96	5	6/1/2015	96	M. Ostaszewicz	M. Chrystian		4164	HYD-13-006
0.93	5	5/27/2014	89	M. Ostaszewicz	S. Wilson	P. Mason	4368	HYD-13-006
0.94	6	5/27/2013	100	M. Ostaszewicz	S. Wilson	P. Mason	4652	HYD-13-006
1.04	4	5/28/2012	93	M. Ostaszewicz	S. Wilson	P. Mason	3332	HYD-13-006



## **Appendix C**

### **Storm Water Management Report**



**CANADIAN INFRASTRUCTURE DESIGN CONSULTANTS INC.**

Business N0: 84212 0586 RT0001

# Storm Water Management Report

1–21 John Street and 46–50 Ontario Street,

Proposed Mixed-Use

Purpose-Built Rental Development

Town of Grimsby, Ontario

Prepared for: Caricari Lee Architects Inc

Prepared by: **Canadian Infrastructure Design Consultants Inc. (CIDC)**

Date: January 2026





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## 1. INTRODUCTION

Canadian Infrastructure Design Inc has been retained by the Carcari Architect Inc. to provide the storm Water Management report in support of the site plan application made to Town of Grimsby for the parcel of land that combines Blocks of residential lots on John Street in the Town of Grimsby, to develop the property into multi-storied (16 Story) commercial office space and residential apartment dwellings aligning with the town's economic development goals The total area of the parcel of land is approximately 0.89ha

The site is located South of Canadian Railway Corridor at the Northeast side of intersection of Ontario Street and John Street, fronting south side to John Street.



Figure 1: LOCATION MAP

## 2. EXISTING CONDITION

The subject Property at present is low density residential Lot bounded by open space on the Northeast on west side abuts a residential lot that has heritage significance and accordingly is relocated to preserve the aesthetic and heritage value in post development scenario. The



site is part of the contributing drainage area of the existing water course watershed and at present invariably draining as sheet flow into grass swales in the direction of Northeast, while front yards of dwelling units draining south to John street.

The topographic survey conducted in July 2025 was modelled for the drainage pattern as shown in Figure 1 and drawing Predevelopment PD-1 in Appendix A.

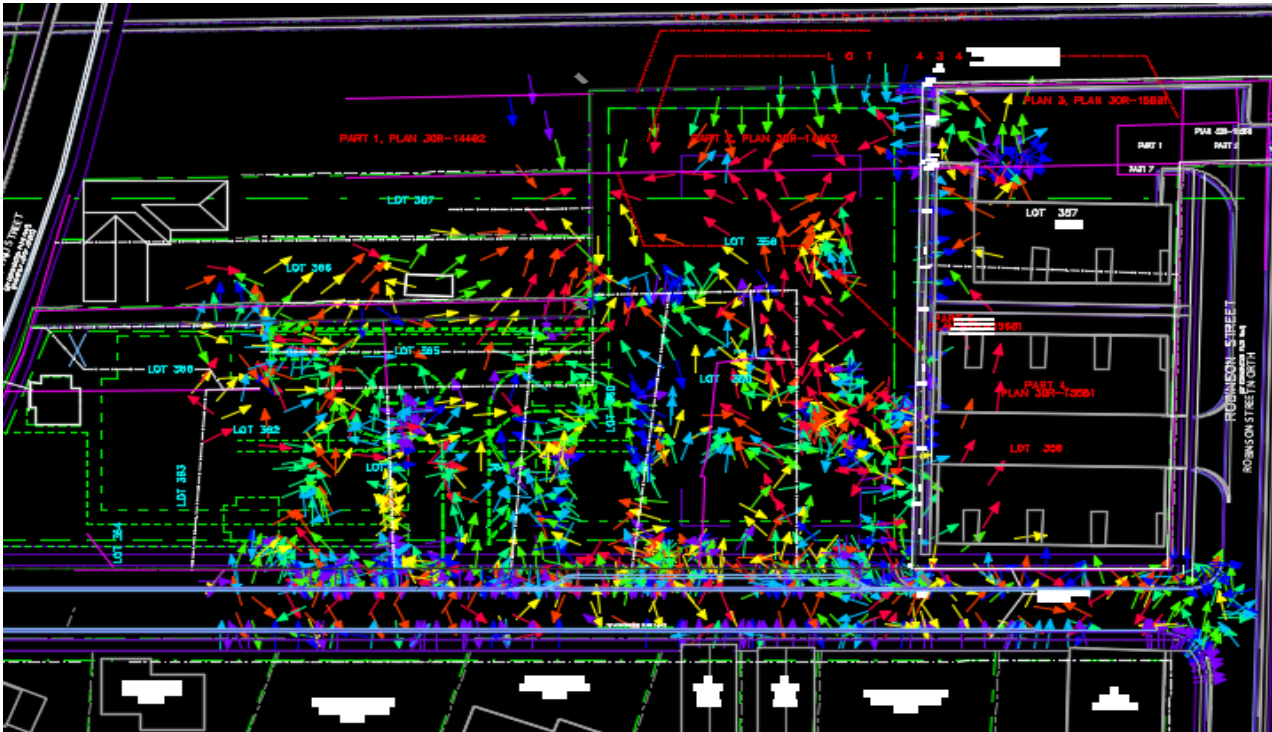


Figure 2: PRE-DEVELOPMENT DRAINAGE DIRECTION

The total area of the lot for development area is 0.89 ha.



**2.1 Existing Drainage Direction in Pre-Development Scenario**

**Table 1** shows the areas in existing scenarios and the direction of flow. Ref; to Drawing PD-1 in APPENDIX A

**Table 1**

<b>Drainage Area</b>	<b>Area Number</b>	<b>Development Area</b>	<b>Area ha</b>	<b>Area m2</b>	<b>Flowing To</b>
Residential	101	Yes	0.606	6,060	North East
Residential	102	Yes	0.127	1,270	North East
Commercial	103	Yes	0.053	530	Ontario Street
Road Widening	104	Yes	0.052	520	John Street
Road Widening	105	Yes	0.023	230	Ontario /John Street
Easement	106	Yes	0.028	280	North East
Residential/Openspace	107	No	0.351	3,510	North East
Commercial	108	No	0.150	1,500	Ontario Street
<b>Total Area</b>			<b>1.390</b>	<b>13,900</b>	
<b>Development Area</b>			<b>0.889</b>	<b>8,890</b>	Check
<b>External Area</b>			<b>0.501</b>	<b>5,010</b>	0.000



**2.2 IDF Curve Data**

Predevelopment and Post Development flows were calculated based on IDF Curve Data that was obtained from Niagara Peninsula Conservation Authority, Stormwater Management Guidelines. The nearest of the IDF data to Grimsby is that of Saint Catherine

The Values of Parameters a, b & c for IDF are reproduced in **Table 2** from (Table 7.2.2 of Niagara Peninsula Conservation Authority) for Saint Catherine area.

The rainfall intensity is generally taken from Intensity Duration Frequency (IDF) curves derived for the study area from historical rainfall data (see Section 7.2.3) at a nearby rain gauge. **Table 7.2.2** gives some sample standard IDF coefficients (a, b, c) for three locations in the Niagara Region where the intensity can be calculated using:

$$i = \frac{a}{(t_c + b)^c}$$

**Table 7.2.2 - Sample IDF Coefficients in the Niagara Region**

Location	Storm Frequency (years)	a	b	c
<b>St. Catherines</b>	2	567	5.2	0.746
	5	664	4.7	0.744
	10	724	4.3	0.739
	25	821	4.0	0.735
	50	900	3.8	0.734
	100	980	3.7	0.732
<b>Welland</b>	2	755	8	0.789
	5	830	7.3	0.777
	10	860	6.5	0.763
	25	900	5.2	0.745
	50	960	5.1	0.736
	100	1020	4.7	0.731
<b>Niagara Falls</b>	2	521.97	5.28	0.7588
	5	719.50	6.34	0.7687
	10	577.93	2.483	0.669
	25	1020.69	7.29	0.779
	100	1264.57	7.72	0.7814

**St Catherine IDF**



**Table-2**

<b>Return period</b>	<b><u>2-yr</u></b>	<b><u>5-yr</u></b>	<b><u>10-yr</u></b>	<b><u>25-yr</u></b>	<b><u>50-yr</u></b>	<b><u>100-yr</u></b>
a	567	664	724	821	900	980
b	5.2	4.7	4.3	4.0	3.8	3.7
c	0.746	0.744	0.739	0.735	0.734	0.732

### **3 PROPOSED DEVELOPMENTS**

The proposed development for the subject land consists of developing the property into multi-storied (16 Story) commercial office space and residential apartment building with associated facilities and Underground Parking Lot.

The subject area of development is predominantly covered by the new building envelop and underground parking. The proposed grading on the peripheral of the building footprint is proposed to conforms to the existing drainage pattern to minimize the impact in post development scenario on the surrounding properties of the subject lot and to have minimum development Impact on the existing water course.

Table 3 derived from (Table 7.21 of Niagara Peninsula Conservation Authority) below shows the Rational Coefficient against each land use taken in calculating the Predevelopment and Post development Flows



Table-3

**Table 7.2.1 - Runoff Coefficients for Different Land Use Types**

Land Use Category	Runoff Coefficient, C
<b>Parks/Open Space</b>	0.2
<b>Low Density Residential</b>	0.5
<b>Medium Density Residential</b>	0.65
<b>High Density Residential</b>	0.75
<b>Institutional</b>	0.75
<b>Industrial</b>	0.75
<b>Commercial</b>	0.9
<b>Paved Areas</b>	0.95



## **4. STORM WATER MANAGEMENT PLAN**

### **4.1 Design Criteria**

The stormwater management (SWM) design for the proposed development at 1–21 John Street and 46–50 Ontario Street, Mixed-Use Purpose-Built as Rental Development Grimsby, Ontario has been prepared in accordance with the following governing documents and standards:

Ontario Ministry of the Environment, Conservation and Parks (MECP):  
*Stormwater Management Planning and Design Manual (March 2003, as amended).*

- MECP Consolidated Linear Infrastructure Environmental Compliance Approval (CLI-ECA) requirements for municipal stormwater systems.
- Ontario Provincial Standards and Specifications (OPSS/OPS) for construction materials and methods.
- Niagara Peninsula Conservation Authority, Stormwater Management Guidelines

The design addresses water quality, quantity, erosion, and water balance criteria to maintain pre-development hydrologic conditions and protect downstream receiving systems.

### **4.2 Stormwater Management Objectives**

The objectives of the proposed stormwater management system are to:

1. Control post-development peak flows to pre-development levels for applicable design storms.
2. Achieve a minimum 80% long-term total suspended solids (TSS) removal efficiency.
3. Provide erosion control through extended detention of the 25 mm rainfall event over 24 hours.
4. Maintain water balance and promote infiltration where feasible through Low Impact Development (LID) measures.



5. Safely convey runoff from both minor (2year) and major (100-year) design storm events.
6. Ensure long-term maintainability and compliance with CLI-ECA operation and monitoring requirements.

### 4.3 Hydrologic Design Criteria

**Table-4**

Parameter	Design Standard / Criterion	Notes
Design Storms	2-year (minor), 100-year (major)	Derived from IDF curves for Saint Catherine IDF Values
Peak Flow Control	Post-development $\leq$ Pre-development for 2-, 5-, 10-, 25-, 50-, and 100-year storms	Match outlet flow rates
Water Quality	$\geq$ 80% long-term TSS removal ("Enhanced Level")	Per MECP criteria
Water Balance / Infiltration	Maintain 90th percentile rainfall ( $\approx$ 25mm) through LID infiltration or storage	Adjusted per site conditions
Minor System Capacity	5-year storm	Curb/gutter, catch basins, pipes
Major System Capacity	100-year storm	Overland routes, road conveyance, emergency flow paths
Freeboard	$\geq$ 0.3 m from 100-year HGL to building openings	Minimum for residential/commercial lots

The proposed grading of the subject property is designed to preserve existing drainage patterns. The flow in post development will be directed predominantly towards the Northeast corner into the existing water course through a head wall. A portion of drainage area in front of lot facing John Street where existing flow-is directed in predevelopment scenarios will have a slight increase in flow to storm sewers in post development scenario, however, will be compensated by providing additional flow control over 2 years flow to the water course so that the predevelopment flows and post development flows remain same in developed scenario. The methodology adopted for restricting post development flow to predevelopment flows is as follows



**Predevelopment Scenario**

Predevelopment Flow to Water course on Northeast =	A m3/sec
Predevelopment Flow to John Street/Ontario Street =	B m3/sec
Total Predevelopment Flow =	A+B m3/sec

**Post development Scenario**

Post development Flow to Water course on Northeast (Controlled) =	C m3/sec
Post development Flow to John Street/Ontario Street (Uncontrolled)=	D m3/sec
Total Post development Flow =	C+D m3/sec

Control Flow of “C” in Post development is such that  $(C+D) = (A+B)$  m3/sec

This will be achieved by providing additional storage. The Flow generated by a 100-year storm in post development conditions will be released to release rate of 2-year storm flow of predevelopment... Storm events greater than 2 years up to 100 years will be stored in as

1. Roof Storage
2. Underground Tank/Super pipe storage.
3. Infiltration Trench storage.

The minor system pipe network is designed based on 2 Year storm event capacity. The grading is provided as such that no surface ponding is created. The overland flow for storms above 100 years will be conveyed overland as shown on Drawing PD-2

Rectangular Soak away filled with clean granular stone lined with geotextile fabric will receive runoff from a storm pipe from roof. Existing grass areas of low-level easement will be graded and utilized as infiltration galleries and enhanced grass swales provided within the property line.



The infiltration swale thereby allow it to infiltrate into the native soil. It will service as Low Impact Development (LID) feature. For quality control and BMP, soak away and infiltration galleries are within the LID methods that meet objectives of water balance as well as water quality improvement

#### **4.4 Pre-development flow**

The predevelopment flows from 2 Year to 100 Year are calculated based on the time of concentration (TC) calculated according to Bransby equation in predevelopment flow. The results are shown in Table.5 and Table 5A



Table-5

PRE - DEVELOPMENT FLOWS TO WATER COURSE (A)							
AREA NO - LAND USE	AREA	Unit	C	% AREA	AREA		
Area 101, 102- Exist-Residential	0.7330	ha	0.5	96.3%			
Area 104,105 Road Widening	0.0000	ha	0.5	0.0%			
Area 106 - Easement	0.0280	ha	0.2	3.7%			
Area 103 - Commercial	0.0000	ha	0.9	0.0%			
Total Area contributing (A)	0.7610	ha		100%			
Rational coefficient weighted (C)	0.49						
<i>Bransby Williams</i>			$t_c = \frac{0.057 L}{S^{0.2} A^{0.1}}$				
Length of sheet flow	157.00	m					
Slope ( Average)	1.59	%					
Time of concentration	8.38	min					
Ref ;Stormwater Management Policies and Guideline Niagara Region Conservation Authority							
	Intensity (i) mm/hr	A	B	C	T	$i = A / (tc + B)^C$ IDF- St Catherine	
2Yr Rain fall intensity (i)	mm/hr	80.98	567	5.2	0.746		8.38
5Yr Rain fall intensity (i)	mm/hr	99.74	664	4.4	0.744		8.38
10Yr Rain fall intensity (i)	mm/hr	110.78	724	4.3	0.739		8.38
25Yr Rain fall intensity (i)	mm/hr	129.16	821	4	0.735		8.38
50Yr Rain fall intensity (i)	mm/hr	143.65	900	3.8	0.734		8.38
100Yr Rain fall intensity (i)	mm/hr	158.16	980	3.7	0.732	8.38	
<b>Q = 2.78 CiA/1000</b>							
	m3/sec						
2 Year Flow	0.084						
5 Year Flow	0.103						
10 Year Flow	0.115						
25 Year Flow	0.134						
50 Year Flow	0.149						
100 Year Flow	0.164						





**4.5 Post-Development Flows**

The Post development Flows from 2 Year to 100 Year are calculated based on time of concentration at 10 minutes. The post development Flow is separated as

1. Controlled Flow to Northeast water course ( C )
2. Uncontrolled Flow to John ? Ontario Street ( D )

The results are shown in **Table.7.** and **Table 8** The area number Ext 107 and Ext 108 (See Drawing PD-1), which forms external areas to the site, are not disturbed with the subject development .As such the flow from this area in predevelopment scenario continues in post development scenario without being controlled. However, the rest of the area draining to water course from the site will be controlled to 2-year predevelopment flow of minus the difference in uncontrolled flow from post development to predevelopment for the areas draining to John and Ontario Street.

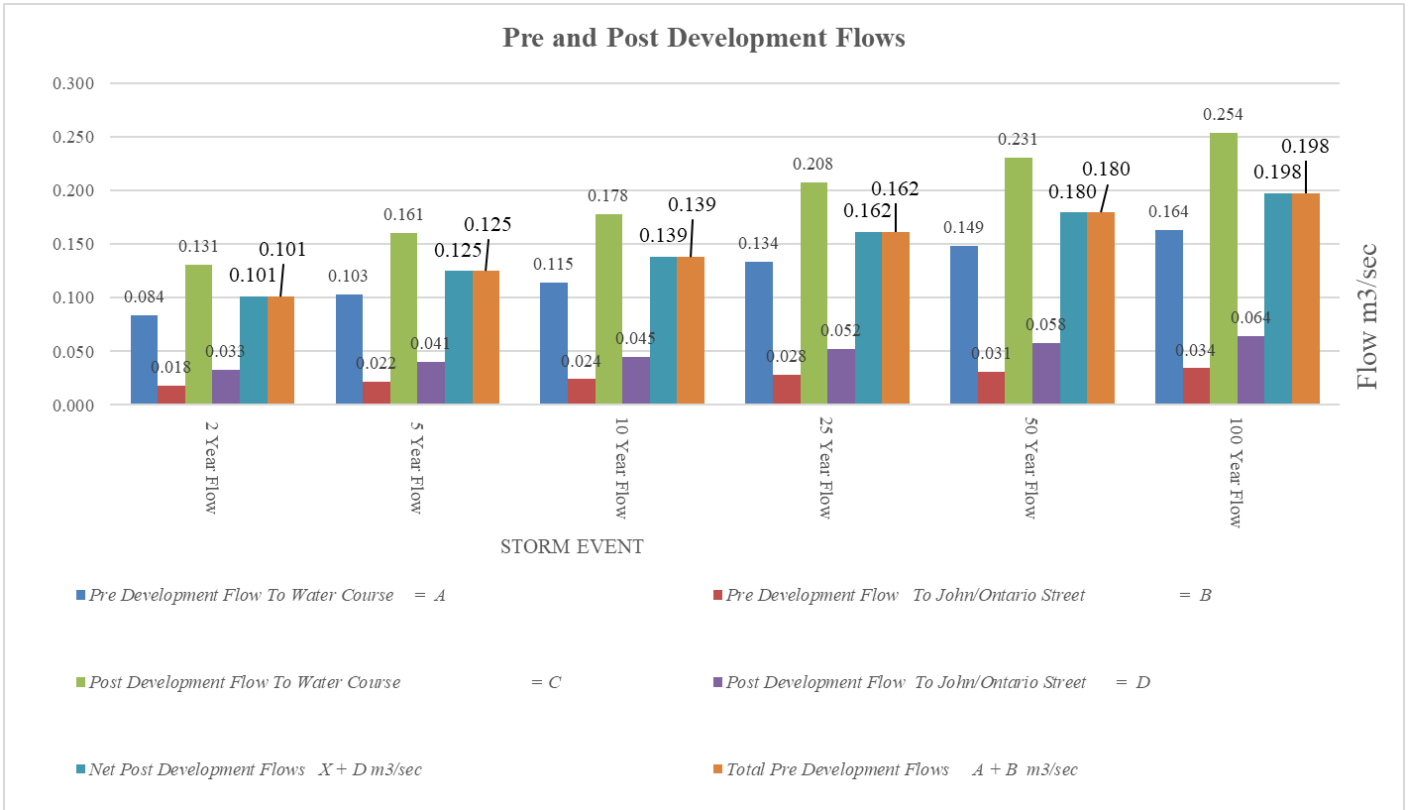
The net release flow will be = 0.056 Mm3/sec as shown below in **Table 6 and Chart 1**

**Table 6**

Pre Development Flow To Water Course = A		Pre Development Flow To John/Ontario Street = B		Post Development Flow To Water Course = C		Post Development Flow To John/Ontario Street = D	
Area Ha	0.76	Area Ha	0.13	Area Ha	0.70	Area Ha	0.19
<b>Storm Event</b>	<b>m3/sec</b>				m3/sec		m3/sec
2 Year Flow	0.084		0.018		0.131		0.033
5 Year Flow	0.103		0.022		0.161		0.041
10 Year Flow	0.115		0.024		0.178		0.045
25 Year Flow	0.134		0.028		0.208		0.052
50 Year Flow	0.149		0.031		0.231		0.058
100 Year Flow	0.164		0.034		0.254		0.064
	<b>Controlled Flow from Site A - ( D - B ) = X m3/sec</b>		<b>Uncontrolled Flow from Site D m3/sec</b>		<b>Total Pre Development Flows A + B m3/sec</b>		<b>Net Post Development Flows X + D m3/sec</b>
2 Year Flow	0.068		0.033		0.101		0.101
5 Year Flow	0.084		0.041		0.125		0.125
10 Year Flow	0.094		0.045		0.139		0.139
25 Year Flow	0.109		0.052		0.162		0.162
50 Year Flow	0.121		0.058		0.180		0.180
100 Year Flow	0.134		0.064		0.198		0.198



Chart 1







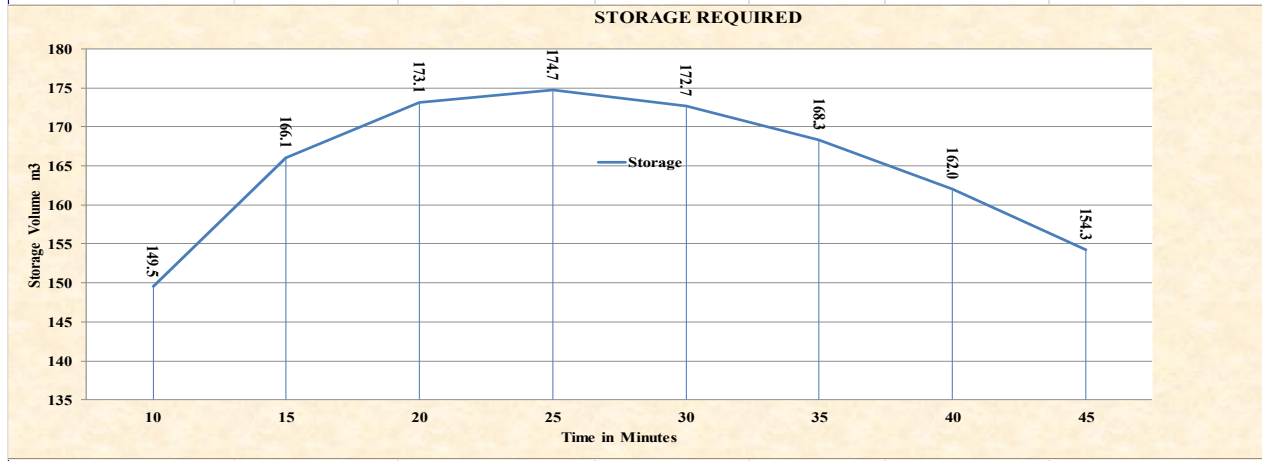


**4.6 Storage Required**

The storage requirements for storm events for up to 100 years are based on the release rates of 2-year pre-development flows. **(0.068 m3/sec See Table 6).**The storage calculation is shown in **Table 9**. The maximum storage required was calculated to be 174.7m3.

**Table 9**

100 Year Storage						
Project Name:	John Stree Apartments Grimsby					
Project No.	2601					
Date.	6-Jan-2026					
File:						
Catchment / Sub Area	Commecial /Residential Building					
Description	John Street , Apartments Grimsby					$i = A/(tc + B)^C$
Drainage Area ha	0.889					
Runoff Coefficient C Weighted	0.891					
Allowable Discharge (m/s)	0.068					
Initial Tc (min):	10					
Tp. (min):	10.00					
IDF - A:	980					
IDF - B:	3.7					
IDF - C:	0.732					
Rainfall Duration (min)	Rainfall Intensity (mm/hr)	Peak Rate of Runoff, Q (m/s)	Runoff Volume (cu.m)	Outflow Volume (cu.m)	Storage Volume (cu.m)	
10	144.3	0.3	190.5	41.0	149.5	
15	114.9	0.3	227.6	61.5	166.1	
20	96.6	0.2	255.1	82.0	173.1	
25	84.0	0.2	277.2	102.5	174.7	← Max Storage
30	74.6	0.2	295.8	123.0	172.7	
35	67.5	0.1	311.8	143.5	168.3	
40	61.7	0.1	326.0	164.0	162.0	
45	57.0	0.1	338.8	184.5	154.3	





**4.7 Storage Provided.**

The storage will provide as roof storage and storage Tanks/Super Pipes in Ground . The total storage available is as shown in **Table 11**

The Roof will be equipped with controlled roof drains that control the flow to 1.37L/Sec per Notch. For a drainage area of 5400 sqm The **Table 10** Shows the Roof Calculation

**Table 10**

AREA NUMBER	ROOF AREA m <sup>2</sup>	NOTCH AREA RATING m <sup>2</sup>	ROOF STORAGE			HEIGHT m*	WATER DEPTH m	STORAGE VOLUME m <sup>3</sup>
			DISCHARGE PER NOTCH L/SEC	NUMBER OF NOTCHES PER FLOW DRAIN	TOTAL DISCHARGE L/sec			
1	225	232	1.37	1	1.37	0.102	0.091	6.83
2	225	232	1.37	1	1.37	0.102	0.091	6.83
3	225	232	1.37	1	1.37	0.102	0.091	6.83
4	225	232	1.37	1	1.37	0.102	0.091	6.83
5	225	232	1.37	1	1.37	0.102	0.091	6.83
6	225	232	1.37	1	1.37	0.102	0.091	6.83
7	225	232	1.37	1	1.37	0.102	0.091	6.83
8	225	232	1.37	1	1.37	0.102	0.091	6.83
9	225	232	1.37	1	1.37	0.102	0.091	6.83
10	225	232	1.37	1	1.37	0.102	0.091	6.83
11	225	232	1.37	1	1.37	0.102	0.091	6.83
12	225	232	1.37	1	1.37	0.102	0.091	6.83
13	225	232	1.37	1	1.37	0.102	0.091	6.83
14	225	232	1.37	1	1.37	0.102	0.091	6.83
15	225	232	1.37	1	1.37	0.102	0.091	6.83
16	225	232	1.37	1	1.37	0.102	0.091	6.83
17	225	232	1.37	1	1.37	0.102	0.091	6.83
18	225	232	1.37	1	1.37	0.102	0.091	6.83
19	225	232	1.37	1	1.37	0.102	0.091	6.83
20	225	232	1.37	1	1.37	0.102	0.091	6.83
21	225	232	1.37	1	1.37	0.102	0.091	6.83
22	225	232	1.37	1	1.37	0.102	0.091	6.83
23	225	232	1.37	1	1.37	0.102	0.091	6.83
24	225	232	1.37	1	1.37	0.102	0.091	6.83
	<b>5400</b>		<b>32.88</b>					<b>163.80</b>



**Table 11**

Storage Summary			
DESCRIPTION	AREA M2	PONDING DEPTH M	VOLUME
Roof Storage	5440	0.09	163.80 m3
U/G Tanks	20	1.2	24 m3
Total Storage Provided			187.80 m3
Total Storage Required			174.7m3

**4.8 Orifice Control**

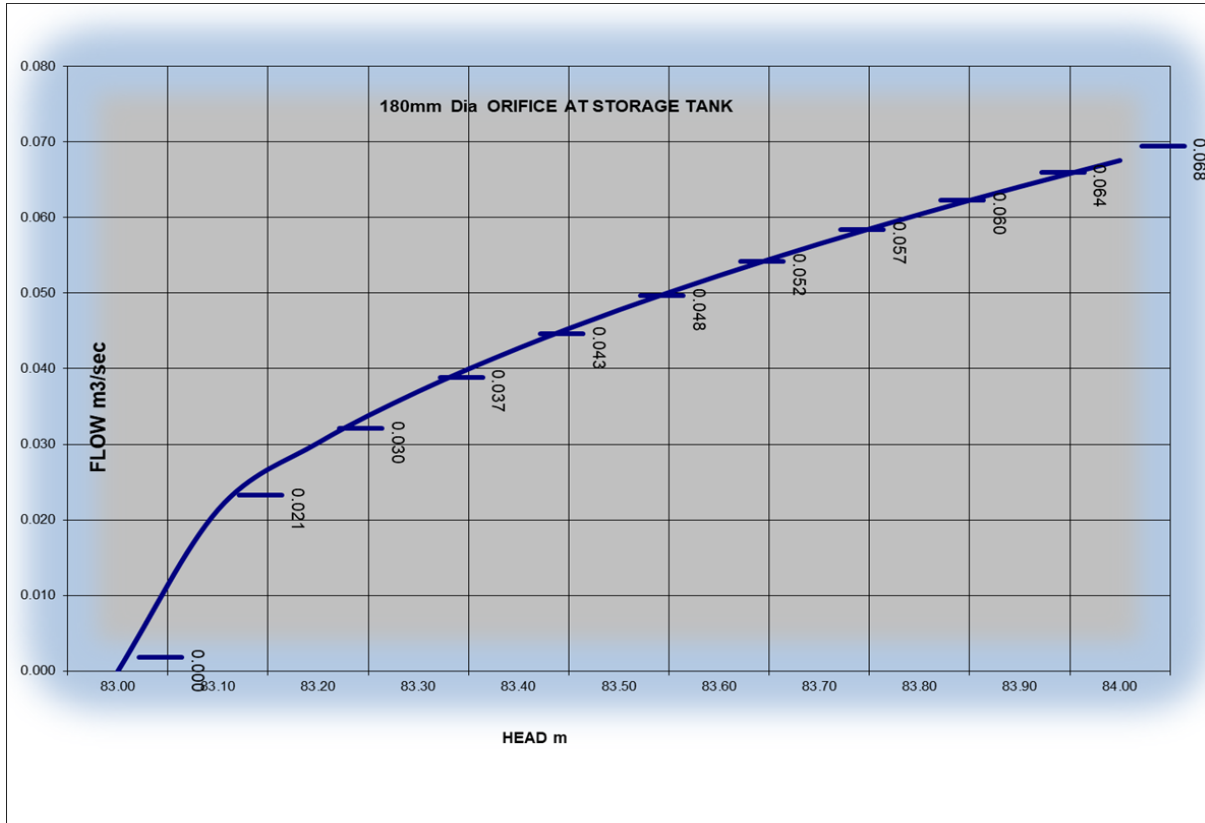
To restrict the flow to water course on Northeast of the site to 2 Year predevelopment flow an orifice of 180 mm size is provided at the outlet of Control of Storage Tank this will restrict the flow to the outlet creek to a maximum of 0.068 L/Sec. while utilizing the storage within the storage tank and roof for storm events greater than 2 years to 100 years. The calculations are shown in **Table 11** and **Chart 2**

**Table 11**

ORIFICE CONSTANT	AREA A m2	HEAD H m	ORIFICE FLOW Q m3/sec	ORIFICE DIAMETER mm	ORIFICE FORMULA $Q = C A(2gh)^{0.5}$	ELEVATION m
0.600	0.025	0.000	0.000	0.180	83.09	83.00
0.600	0.025	0.100	0.021	0.180		83.10
0.600	0.025	0.200	0.030	0.180		83.20
0.600	0.025	0.300	0.037	0.180	83.00	83.30
0.600	0.025	0.400	0.043	0.180		83.40
0.600	0.025	0.500	0.048	0.180		83.50
0.600	0.025	0.600	0.052	0.180	82.91	83.60
0.600	0.025	0.700	0.057	0.180		83.70
0.600	0.025	0.800	0.060	0.180		83.80
0.600	0.025	0.900	0.064	0.180		83.90
0.600	0.025	1.000	0.068	0.180		84.00



Chart 2



#### 4.9 Infiltration.

Infiltration Trench filled with 50 mm Clear Stone. A void ratio of 0.4 is applied for calculating the volume of soakage pit. The 5mm rain fall is stored in the soak away pit as shown PD-2 The runoff from roofs of the building will be connected to Infiltration Trench. The run of volume of 44.45 m<sup>3</sup> that will be stored in the soak away /Infiltration gallery will infiltrate into the ground. The required length of infiltration is around 71 m. The rainfall volume stored in the Soak away pit will infiltrate in the ground, based on the percolation rate of 25mm/hr. (Average value for sandy loam, soil classification group B). The soak away pit will have a cross section of 1.25 m wide, and 1.25 m depth as shown on PD-2. The Calculations are shown in **Table 12**



Table 12

Infiltration		Average permeability for different soil textures in mm/hour			
Total Area ha	0.889	Sand	50.00		
Infiltration Volume m3	44.45	Sandy loam	25.00		
Void Ratio	0.4	Loam	13.00		
Total Volume of Trench m3	111.13	Clay loam	8.00		
Trench Width m	1.25	Silty clay	2.50		
Trench height m	1.25	Clay	0.50		
Total Length of Trench m	71.12				
<b>AREA OF INFILTRATION TRENCH BOTTOM</b>					Units
V=	Run off volume to be infiltrated to soak away pit 5 mm of rainfall				m3
P=	Percolation rate of soil				mm/hr
n=	Porosity of clear stone				0.4
Δt	Retention time, taken 48 hr				hr
m	Drainage area				m2
r	Rain fall to be infiltrated in mm				mm
$A = \frac{1000V}{Pn\Delta t}$ Equation 4.3 Infiltration Bottom Area, SWM Planning & Design Manual 2003					
Infiltration Trench bottom area m2 (A)					92.60
$D = P\Delta t$ Equation 4.3 Allowable Soakaway Pit Depth (d), SWM Planning & Design Manual 2003					
Calculated min D	1.2				
Provided	1.25				
Width	1.25				
Length	74.08				
<b>RATING CURVE FOR SOAK AWAY PIT</b>					
<b>Q (INFILTRATION RATE)</b>					<b>VOLUME INFILTRATED</b>
$Q = f\left\{\frac{P}{3,600,000}\right\}(2LD+2WD+LW)n$ Equation 4.17 Soakaway Pit Rating Curve, SWM Planning & Design Manual 2003					
Discharge from Soak Pit Q = $f\left\{\frac{P}{3,600,000}\right\}(2LD+2WD+LW)n$ L/sec	Longivity factor	Total length of soak away pit	Width of each soak away pit in m	Depth of water in soak away pit in m	m3 Storage $V = LWD * n * f$
<b>Q L/sec</b>	<b>f</b>	<b>L</b>	<b>W</b>	<b>d</b>	
0.0	1	1	1.25	1.25	1
0.3	1	20	1.25	1.25	13
0.6	1	40	1.25	1.25	25
0.8	1	60	1.25	1.25	38
1.1	1	80	1.25	1.25	50



#### **4.10 Quality Control.**

Quality control is achieved by providing Storm Scepter / Oil and Grit removal by Imbrium **EF Model: EF4** that will have the capacity of removal rate of 90 % of TSS and 90 % of annual water runoff capture for treatment. The details are shown in **Attachment 1** The Town of Grimsby has recently changed their requirements for stormwater quality units and have adopted ISO 14034/ETV. As such, stormwater quality units must have ISO 14034/ETV verification, such as our Stormceptor EFO, **EF**, Jellyfish, and Filterra units. Verification of Stormceptor will be done at detail site plan stage.

### **5 SEDIMENT CONTROL.**

- A silt fence shall be installed around the site and outlet and shall be maintained in place while construction is being undertaken.
- Sediment traps shall be installed and shall be maintained in place until driveways have been paved and the landscaping areas grassed.
- Silt traps shall be installed at all parking and Street catch basins / pipe inlet until the driveways have been paved and the landscaping areas grassed.
- Rock Check will be provided while diverting the flow temporarily during construction of services.
- The Site shall be maintained in good operating condition, including the removal of sediment from street CBs periodically as required.



## **Attachment 1**

**OGC EF Model: EF4**

**Estimated Net Annual Sediment (TSS) Load Reduction (%)90**

**Imbrium® Systems**

**ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION**

01/07/2026

Province:	Ontario
City:	Grimsby
Nearest Rainfall Station:	ST CATHARINES AP
Climate Station Id:	6137287
Years of Rainfall Data:	33

Project Name:	1-21 John Street and 46-50 Ontario Street
Project Number:	2601
Designer Name:	Farooq Siddiqi
Designer Company:	Canadian Infrastructure design Inc
Designer Email:	farooq.siddiqi@candesignconsulting.com
Designer Phone:	647-300-6354
EOR Name:	Farooq Siddiqi
EOR Company:	CANADIAN INFRASTRUCTURE DESIGN CONSULTANTS INC.
EOR Email:	Farooq.Siddiqi@Candesignconsulting.com
EOR Phone:	647-300-6354

Site Name:	
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Drainage Area (ha):	0.89
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% Imperviousness:	90.00
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Runoff Coefficient 'c': 0.84

Particle Size Distribution:	CA ETV
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Target TSS Removal (%):	80.0
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Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	23.25
Oil / Fuel Spill Risk Site?	No
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	198.00
Influent TSS Concentration (mg/L):	200
Estimated Average Annual Sediment Load (kg/yr):	978
Estimated Average Annual Sediment Volume (L/yr):	795

Net Annual Sediment (TSS) Load Reduction Sizing Summary	
Stormceptor Model	TSS Removal Provided (%)
EF4	90
EF5	94
EF6	96
EF8	98
EF10	99
EF12	100

**Recommended Stormceptor EF Model: EF4**  
**Estimated Net Annual Sediment (TSS) Load Reduction (%): 90**  
**Water Quality Runoff Volume Capture (%): > 90**



### 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 waterways.

### 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.

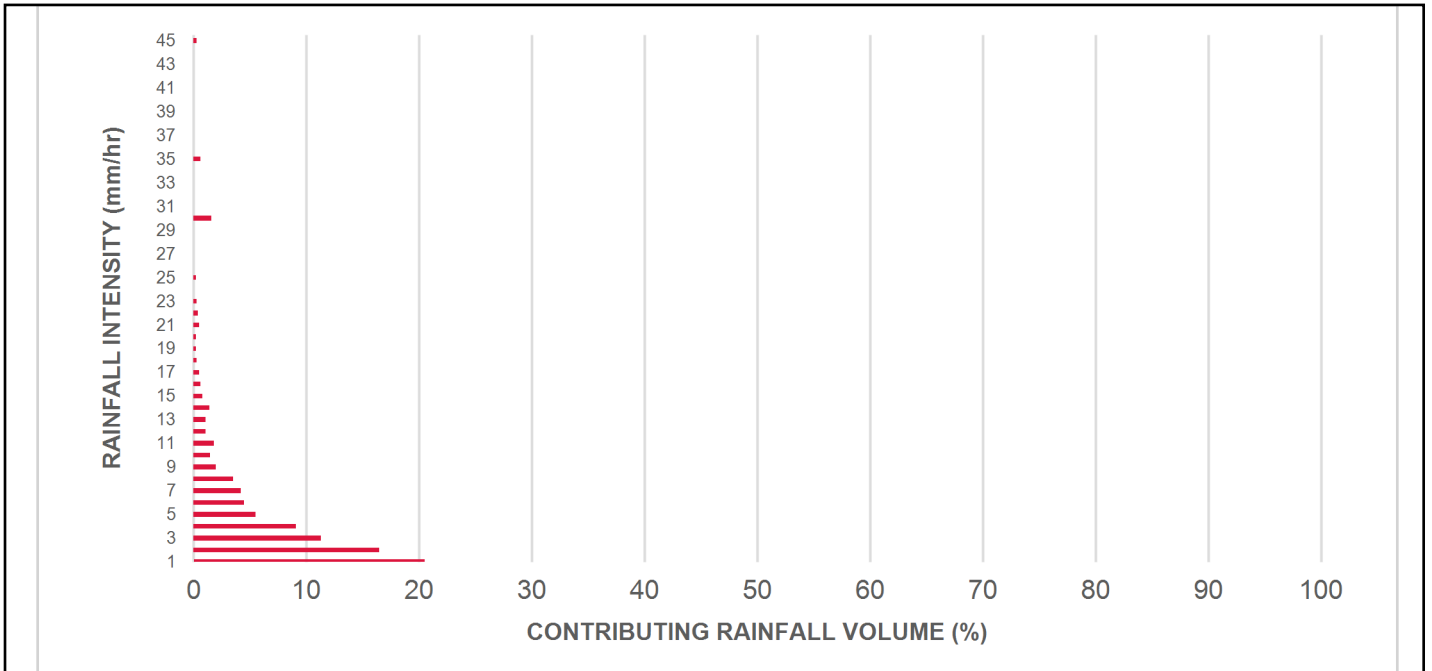
Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

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	9.2	9.2	1.04	62.0	52.0	100	9.2	9.2
1.00	20.5	29.7	2.08	125.0	104.0	100	20.5	29.7
2.00	16.5	46.2	4.16	249.0	208.0	98	16.2	45.9
3.00	11.3	57.5	6.23	374.0	312.0	92	10.5	56.4
4.00	9.1	66.7	8.31	499.0	416.0	87	7.9	64.3
5.00	5.5	72.2	10.39	623.0	520.0	85	4.7	69.0
6.00	4.5	76.7	12.47	748.0	623.0	83	3.8	72.8
7.00	4.2	80.9	14.55	873.0	727.0	83	3.5	76.3
8.00	3.5	84.4	16.63	998.0	831.0	82	2.9	79.1
9.00	2.0	86.5	18.70	1122.0	935.0	81	1.7	80.8
10.00	1.5	88.0	20.78	1247.0	1039.0	81	1.2	82.0
11.00	1.8	89.8	22.86	1372.0	1143.0	83	1.5	83.5
12.00	1.1	90.9	24.94	1496.0	1247.0	85	0.9	84.4
13.00	1.1	92.0	27.02	1621.0	1351.0	88	1.0	85.4
14.00	1.4	93.4	29.10	1746.0	1455.0	86	1.2	86.6
15.00	0.8	94.2	31.17	1870.0	1559.0	80	0.6	87.3
16.00	0.6	94.8	33.25	1995.0	1663.0	75	0.4	87.7
17.00	0.5	95.3	35.33	2120.0	1767.0	71	0.4	88.1
18.00	0.3	95.6	37.41	2245.0	1870.0	67	0.2	88.3
19.00	0.2	95.9	39.49	2369.0	1974.0	63	0.1	88.4
20.00	0.2	96.1	41.57	2494.0	2078.0	60	0.1	88.6
21.00	0.5	96.6	43.64	2619.0	2182.0	57	0.3	88.9
22.00	0.4	97.0	45.72	2743.0	2286.0	55	0.2	89.1
23.00	0.3	97.3	47.80	2868.0	2390.0	52	0.1	89.2
24.00	0.0	97.3	49.88	2993.0	2494.0	50	0.0	89.2
25.00	0.2	97.4	51.96	3117.0	2598.0	48	0.1	89.3
30.00	1.6	99.1	62.35	3741.0	3117.0	40	0.7	89.9
35.00	0.6	99.7	72.74	4364.0	3637.0	35	0.2	90.2
40.00	0.0	99.7	83.13	4988.0	4157.0	30	0.0	90.2
45.00	0.3	100.0	93.52	5611.0	4676.0	27	0.1	90.2
<b>Estimated Net Annual Sediment (TSS) Load Reduction =</b>								<b>90 %</b>

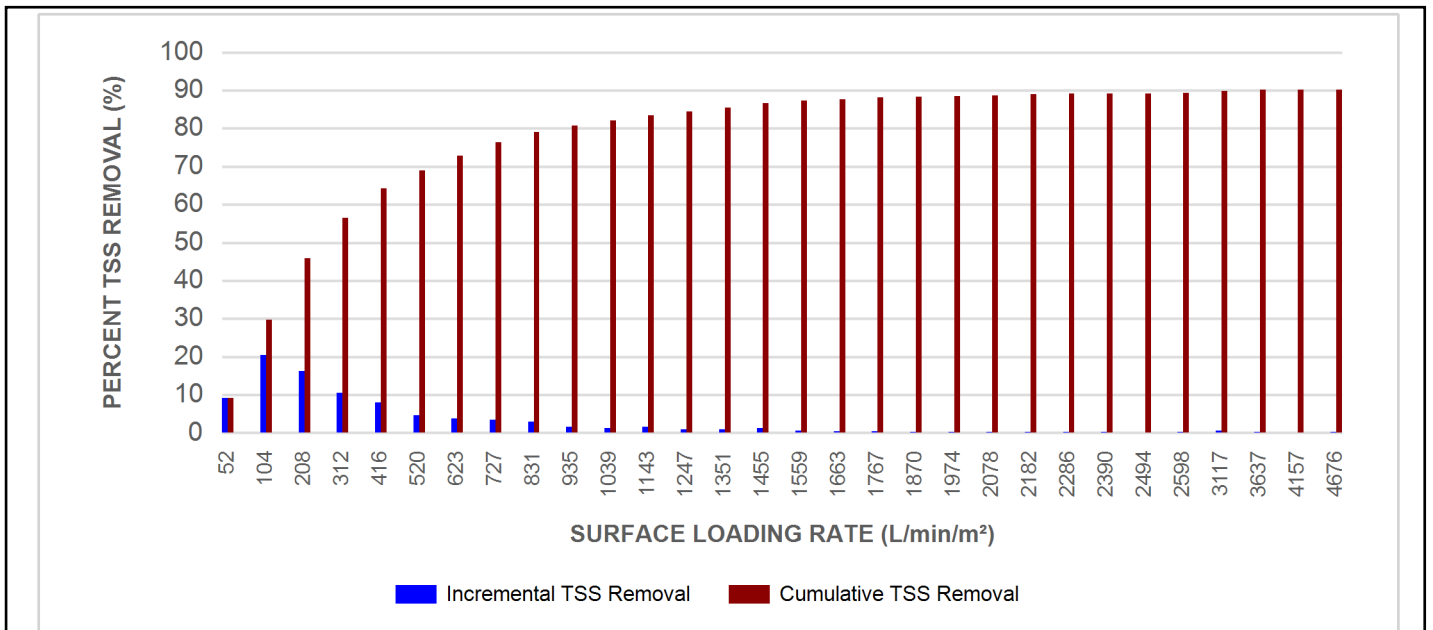
Climate Station ID: 6137287 Years of Rainfall Data: 33



**RAINFALL DATA FROM ST CATHARINES AP 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

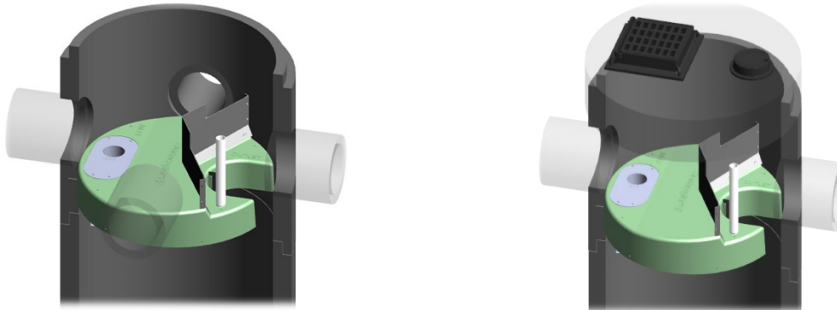
► Stormceptor® EF and EFO feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV Procedure for Laboratory Testing of Oil-Grit Separators, and the exceptional scour test performance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

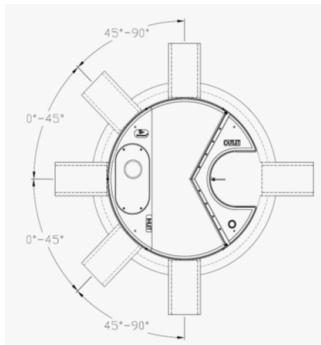
DESIGN FLEXIBILITY

► 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)	(ft³)	(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/ft³ )

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>

**Table of TSS Removal vs Surface Loading Rate Based on Third-Party Test Results  
Stormceptor® EF**

SLR (L/min/m <sup>2</sup> )	TSS % REMOVAL	SLR (L/min/m <sup>2</sup> )	TSS % REMOVAL	SLR (L/min/m <sup>2</sup> )	TSS % REMOVAL	SLR (L/min/m <sup>2</sup> )	TSS % REMOVAL
1	70	660	46	1320	48	1980	35
30	70	690	46	1350	48	2010	34
60	67	720	45	1380	49	2040	34
90	63	750	45	1410	49	2070	33
120	61	780	45	1440	48	2100	33
150	58	810	45	1470	47	2130	32
180	56	840	45	1500	46	2160	32
210	54	870	45	1530	45	2190	31
240	53	900	45	1560	44	2220	31
270	52	930	44	1590	43	2250	30
300	51	960	44	1620	42	2280	30
330	50	990	44	1650	42	2310	30
360	49	1020	44	1680	41	2340	29
390	48	1050	45	1710	40	2370	29
420	48	1080	45	1740	39	2400	29
450	48	1110	45	1770	39	2430	28
480	47	1140	46	1800	38	2460	28
510	47	1170	46	1830	37	2490	28
540	47	1200	47	1860	37	2520	27
570	46	1230	47	1890	36	2550	27
600	46	1260	47	1920	36	2580	27
630	46	1290	48	1950	35	2600	26

## STANDARD PERFORMANCE SPECIFICATION FOR “OIL GRIT SEPARATOR” (OGS) STORMWATER QUALITY TREATMENT 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 <sup>3</sup> sediment / 265 L oil
	5 ft (1524 mm) Diameter OGS Units:	1.95 m <sup>3</sup> sediment / 420L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m <sup>3</sup> sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m <sup>3</sup> sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m <sup>3</sup> sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m <sup>3</sup> 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<sup>2</sup> to 1400 L/min/m<sup>2</sup>, 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<sup>2</sup> and 1400 L/min/m<sup>2</sup> 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<sup>2</sup> shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m<sup>2</sup>. No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m<sup>2</sup>.

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m<sup>2</sup> shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m<sup>2</sup>, and shall be calculated using a simple proportioning formula, with 1400 L/min/m<sup>2</sup> 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<sup>2</sup>.

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<sup>2</sup>.