A. J. Clarke and Associates Ltd.
SURVEYORS • PLANNERS • ENGINEERS

THE CITY OF NIAGARA FALLS

6259 & 6293 DORCHESTER ROAD

FUNCTIONAL SERVICING & STORMWATER MANAGEMENT REPORT

November 2022

PANORAMIC PROPERTIES INC.

Project Number: 202139

FUNCTIONAL SERVICING & STORMWATER MANAGEMENT REPORT

6259 & 6293 DORCHESTER ROAD NIAGARA FALLS, ON

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1. INTRODUCTION

1.1. STUDY OBJECTIVES

A.J. Clarke and Associates Ltd. (AJC) have been retained by Panoramic Properties Inc., to prepare a functional servicing and stormwater management report for the proposed residential Apartment Building development located at Dorchester Road in the City of Niagara Falls, Ontario. The proposed lands are four parcels of land, located at 6259-6293 Dorchester Road in the City of Niagara Falls. The proposed site is bounded by residential properties to the north, south, west and to the east is bounded by Dorchester Road. The proposed development comprises an area of approximately 0.763 ha. An aerial illustration of the project location is depicted below in **Figure 1**.

Figure 1: Site Location

The objective of this report is to develop site servicing and grading to support the proposed site plan provided by BJC Architects Inc. The report will also address stormwater management with respect to stormwater quantity and quality controls in accordance with the current drainage and stormwater management policies and design criteria endorsed by the City of Niagara Falls (City), Niagara Region (NR), Ministry of Environment Conservation and Parks (MECP) and other regulatory agencies, as appropriate.

Sheet A101 represents the proposed Site Plan for the subject development and is provided in **Appendix A** for reference.

1.2. BACKGROUND INFORMATION

The following documents and reports have been reviewed in the preparation of this report:

- City of Niagara Falls "Engineering Design Guidelines Manual (2016)"
- City of Niagara Falls – As Constructed drawings:
    - 70-C-5 – Storm Sewer on Dorchester Rd from Stokes Street to Barker St (CC-609R1)
    - 67-C-12 – Storm Sewer Construction – Dorchester Rd from Coach Drive to Stokes St (CC-623R0)

1.3. EXISTING TOPOGRAPHY AND DRAINAGE

Under existing conditions, the topographic information obtained by J.D. Barnes Limited, for field work completed on May 18, 2019, shows that the majority of the site generally slopes from the northeast corner of the site to the southwest corner by approximately 1.5m with some property frontage sloping to the road allowance. Dorchester Road slopes from north to south with 0.95m of fall across the site frontage.

The natural topography of the subject site varies from a high elevation of approximately 195.25m at the northeast corner to low ponding areas near 193.5m along the south property limits.

Sheet 1 in **Appendix A** represents the Existing Topography and drainage pattern for the subject site.

1.4. PROPOSED DEVELOPMENT

The Site Plan prepared by BJC Architects Inc. indicates that the proposed development consists of a 5-storey apartment building containing a total of 74 units. The building footprint, including balconies, is approximately 1,672m^2 in area, not including balconies. A total of 94 surface parking spaces are proposed including 4 accessible spaces and one (1) loading space. The Site Plan drawing prepared by BJC architects Inc. has been included in **Appendix A** for reference.

2. DESIGN OF SERVICES

2.1. SANITARY SERVICING

There is an existing 450mm diameter sanitary sewer flowing southerly at a slope of ±0.99% available on the west side of Dorchester Road, along the east property line of the subject development, which is deep enough to be utilized to service the proposed development.

A 200mm diameter PVC, SDR-35 sanitary sewer at 2% is proposed to service the site which, will tap into to the existing 450mm diameter sanitary sewer on Dorchester Road per the City of Niagara Falls standards. The sanitary sewer system for the proposed development shall be designed and constructed in accordance with the standards and requirements of the City of Niagara Falls. A sanitary inspection manhole is proposed at ±1m within property, per City requirements, set back for the 3.05m road widening to be dedicated to the City of Niagara Falls. Refer to Sheet 1 – Servicing Plan in **Appendix A**.

Site Sanitary Design Parameters (refer to **Appendix B**):

No. of Dwelling Units	74 Apartment Units
Population Density	4 Persons/Unit for 2-bedroom Unit (56 Units) 2 Persons/Unit for 1-bedroom Unit (18 Units)
Total Design Population	260 Persons
Mean Sewage Flow	450 L/cap/day
Sewage Shed Area (total) – Includes ½ Right-of-Way area	0.837 ha
Peaking Factor	5
Infiltration Rate	0.286 L/ha/sec
Manning's n Value	0.013

For Niagara Region:

Estimated Dry Weather Flow	
450 L/cap/day for 266 persons	117,000 L/day (1.354 L/sec)
Estimated Wet Weather Flow (Leakage – Beginning of Lifecycle)	
0.01 L/s/ha for 0.837 ha	723 L/day (0.0084 L/sec)
22 L/cap/day for 260 persons	5,720 L/day (0.066 L/sec)
0.075 L/mm diameter/100m of sewer /hour for 100mm dia. @ 51.6m, 150mm dia. @ 1.3m, and 200mm dia. @ 59.4m	92.9 + 3.5 + 213.8 = 310.2 L/day (0.0036 L/sec)
Estimated Wet Weather Flow (End of Lifecycle)	
0.286 L/s/ha for 0.837 ha	20,650 L/day (0.239 L/sec)

The estimated sanitary demand calculations are provided in **Appendix B**. The estimated peak sanitary demand for the proposed development is **7.01 L/s**. This flow comprises ±2.3% of the capacity of the receiving 450mm City sanitary sewer in Dorchester Road.

2.2. WATERMAIN SERVICING

There is an existing 300mm diameter C.I. watermain approximately in the middle of Dorchester Road. A fire hydrant also exists on Dorchester Road across from the southeast corner of the subject site.

The proposed development will be serviced by a 200mm diameter PVC, DR-18 watermain for fire protection. This main will tap the existing 300mm watermain in Dorchester Road. Prior to entering the site, a 100mm diameter PVC, DR-18 water service will split off the 200mm main allowing for valves to be on each watermain at the property line, set back for the 3.05m road widening to be dedicated to the City of Niagara Falls. The domestic service will parallel the fire main into the building where they will be metered, and backflow prevented accordingly. A fire department connection (siamese connection) is located near the main entrance on the north side of the building with a site fire hydrant within 45m, located near the entrance to the site. Refer to Sheet 1 – Servicing Plan in **Appendix A**.

Site Watermain Design Parameters (refer to **Appendix B**):

No. of Dwelling Units	74 Apartment Units
Population Density	4 Persons/Unit for 2-bedroom Unit (56 Units) 2 Persons/Unit for 1-bedroom Unit (18 Units)
Total Design Population	260 Persons
Per Capita Demand	450 L/cap/day
Water Usage (Based on Sanitary Demand)	1.354 L/sec
Max. Daily Peaking Factor (Per MECP Table 3-1)	2.75
Max. Hourly Peaking Factor (Per Harmon)	4.10
Max. Daily Demand	3.72 L/sec
Max. Hourly Demand	5.56 L/sec
Design Pipe Specification	PVC, CIOD, DR-18, Class 235

The calculated required fire flow (RFF), for building fire protection, per the Ontario building Code (OBC) requirement has been provided in **Appendix B**. The calculated hydrant flow required is **150 L/s**.

An existing fire hydrant flow test has been performed by L & D Waterworks Inc. on July 8, 2021, on a hydrant across from the site at 6278 Dorchester Road, in Niagara Falls, and testing results are provided in **Appendix B**. The theoretical capacity results of the fire hydrant tested resulted in a flow of **536 L/s,** which meets the above calculated minimum OBC requirement.

The watermains for the site shall be designed and constructed in accordance with the standards and requirements of the City of Niagara Falls.

2.3. GRADING AND STORMWATER SERVICING

There is an existing 1050mm diameter concrete storm sewer located on the easterly side of Dorchester Road with slope of ±0.42% flowing southerly that will accept the subject site's stormwater.

Grading has been established to accommodate the proposed building and its entrance accordingly. The proposed grades at the driveway entrance have been set, based on existing Dorchester Road right-of-

way elevations and the adjacent property elevations around the perimeter of the site have been maintained through the use of perimeter retaining walls as required.

As this site slopes from east to west and to the south with crossfall of approximately 1.5m, retaining walls have been proposed to accommodate the parking lot grading and to limit flows off site. The retaining walls will vary in height to a maximum of ±1.8m. The walls will be required to be designed and sealed by a professional engineer, as they are greater than 1.0m high. Berms have also been proposed along the north and south limits of the subject development, utilizing a maximum slope of 3:1 to meet the existing property line elevations. The majority of the existing site drained to adjacent properties to the south and west, which has now been considerably minimized by containing the majority of runoff on site. This stormwater runoff will be collected by the site's storm sewer system (catchbasins) and conveyed to the City's storm sewer system in Dorchester Road. Flows greater than the capacity of the on-site sewer system for the 5-year event will be conveyed overland to the Dorchester Road right-of-way, as per City requirements. On-site stormwater ponding depths have been limited to a maximum of 0.18m allowing for 3cm for flow over high points with maximum 0.15m from CB lids to pavement high points. The site ponding aids in the controlled release to the City's storm sewer system. As runoff is collected by the site catchbasins; roof drainage is conveyed to the site's storm sewer system, a controlled release to the City's system is required to meet the 5-year pre-development condition. The controlled release is obtained through a small diameter orifice tube regulating stormwater released to the City's system at the southeast corner of the site. This controlled release backs up stormwater in the sewer system (pipes and structures) and in the parking lot, allowing a slower release to the City's sewer system, and not contributing to a potential surcharged municipal sewer system by releasing the stormwater too fast.

Refer to **Sheet 1** – Servicing Plan and **Sheet 2** - Grading Plan for the major overland flow route for the site in **Appendix A**.

3. STORMWATER MANAGEMENT

The proposed site will require an on-site stormwater management system including stormwater quantity and quality control. On-site quantity control will be provided to restrict the 5-year post-development peak flow to match, or be less than, the 5-year pre-development flow and provide the required on-site storage utilizing piping, structures and above grade ponding, to provide the necessary volume to accommodate the controlled release of stormwater to the City's storm sewer system. The existing 1050mm diameter storm sewer in Dorchester Road can be utilized to discharge the controlled flow from the storage system.

Stormwater quality is required for the site to the Normal level of control at 70% T.S.S. removal. This will be achieved by providing an oil and grit separator (OGS) at the end of the sewer system before the water is released to the existing storm sewer in Dorchester Road. An OGS, Stormceptor® EF-4, has been sized and the results are included within **Appendix D**.

Sheet 1 represents the Servicing Plan and **Sheet 2** shows the Grading Plan in **Appendix A**.

3.1. RAINFALL AND HYDROLOGIC MODEL

The Chicago 3-hour storm has been used to determine the pre-development and post-development peak flows and onsite storage. Chicago storms are considered to provide a better estimate for the urban development peak flows. The simulation was completed using MIDUSS hydrologic and hydraulic model for 5-year storm event.

3.2. PRE-DEVELOPMENT CONDITION

As stated previously, the study area is currently ±0.763 ha and consists of two existing residential dwellings. According to the existing topography, the entire development has one pre-development catchment area. The pre-development C-value of 0.45 is obtained from the City's runoff coefficient value for single family residential use. **Table 1** below provides a summary of hydrological parameters which have been used to develop the MIDUSS model for the pre-development scenario.

Table 1: Hydrologic Parameters Summary – Existing Condition

Subcatchment ID	Area (ha)	Imp. Areas (%)	Pervious CN	Impervious CN	Slope (m/m)	Flow Length (m)	N Imp.	N Perv.
101	0.763	29	79.69	98.78	0.015	64	0.015	0.25

Using the above hydrological parameters, the MIDUSS model was simulated for the 5-year design storm event. A summary of the pre-development peak flows is shown in **Table 2** below (refer to **Appendix C** for additional MIDUSS output file information).

Table 2: Existing Condition Peak Flow		
Subcatchment		**3-hour Chicago Design Storm Flow (m^3/s)**
ID	Area (ha)	5 - year
101	0.763	0.053

3.3. POST-DEVELOPMENT CONDITION

The post-development drainage areas have been established based on the proposed grades within the Storm Drainage Area Plan, as presented in **Appendix A**. The drainage area plan contains two parts, controlled and uncontrolled areas. The site frontage, adjacent to Dorchester Road, will sheet flow to Dorchester Road in a rain event; therefore, uncontrolled. Also, the perimeter of the site has some grassed areas that will sheet flow to neighbouring properties. It is assumed that the entire site area will be controlled, in the MIDUSS model, to provide a more conservative volume of on-site storage in conjunction with the controlled release rate to the municipal storm sewer system. It is required to provide on-site storage to control the post-development outflow to the pre-development, controlled release condition.

Table 3 below, provides a summary of the hydrological model parameters which have been used in the assessment of the post-development controlled peak flow in the MIDUSS model.

Table 3: Hydrologic Parameters Summary – Post-Development Conditions								
Catchment ID	Area (ha)	Imp. Areas (%)	Pervious CN	Impervious CN	Slope (m/m)	Flow Length (m)	N Imp.	N Perv.
102	0.763	70	79.69	98.78	0.015	25	0.015	0.25

Using the above-noted post-development hydrological parameters, the MIDUSS model was used to simulate the controlled peak flow for the 5-year Chicago design storm event. **Table 4** below, summarizes the post-development peak flow (uncontrolled) for the proposed site.

Table 4: Post-Development Peak Flow		
Catchment		3-hr Chicago Storm Flow (m^3/s)
ID	Area (ha)	5-yr
102	0.763	0.120

3.4. STORMWATER QUANTITY CONTROL

On-site storage will be established by permitting stormwater to back up and fill the sewer pipes, structures and eventually pond above structures (i.e., catchbasins) in the parking lot, before flowing overland into the Dorchester Road right-of-way. The system will detain stormwater runoff and control the 5-year post-development peak flow of 0.120 m^3/s to the maximum 5-year pre-development release rate of 0.053 m^3/s.

Table 5 below, presents the hydrologic simulation results of the proposed on-site storage system. Refer to **Appendix C** for additional information of the MIDUSS output file.

Table 5: Stormwater Management - Quantity Control Summary	
Description	
Existing condition 5-year peak flow (Maximum Target Release Rate) (m^3/s) (subcatchment area 101)	0.053
Post-development 5-year peak flow (Uncontrolled Flow) (m^3/s) (subcatchment area 102)	0.120
Post-development 5-year peak flow with On-site Storage (Controlled Flow) (m^3/s)	0.027
Storage Volume Required (m^3)	~101
Storage Provided (m^3)	~140

As noted in **Table 5** above, the post development (controlled) flow is less than the existing condition peak flow for the 5-year storm event. Furthermore, **Table 5** shows that the provided storage is more than the required storage. For on-site storage details and calculations and MIDUSS output files, refer to **Appendix C**. Post-development outflows from the proposed site will be controlled via a **100mm** diameter orifice tube (PVC, SDR-28, CSA B 182.1) between MH 2 and MH 1 (OGS) which will control the discharge rate into the Dorchester Road storm sewer system to within an acceptable release rate below the target of 53 L/sec.

4. STORMWATER QUALITY CONTROL

Stormwater released from the site is required to be treated to the Ministry of the Environment, Conservation and Parks (MECP) Normal Level of protection, with the removal of 70% T.S.S. as required by the Region of Niagara and the City of Niagara Falls.

The site will have quality control through a treatment train approach to treat dirty water, prior to release from the site, to the receiving storm sewer system. The on-site treatment train system employs grassed swales and sheet flow with an oil grit separator (Stormceptor® EF-4) prior to release to the City's storm sewer system.

The north site area collects the majority of its stormwater from the parking lot and building roof drainage, with some sheet flow behind the north curb. The building roof drainage is typically considered as clean water and does not require treatment but will be treated due to the sewer configuration selected. The west site of the site collects runoff mainly from the parking lot while the east end of the site will sheet flow to the adjacent road allowance. The south side of the site entails a grassed catchment area to limit flow offsite. All this stormwater will be conveyed through the oil grit separator, prior to release to the receiving sewer.

The oil grit separator unit has been sized accordingly for this site by utilizing the Forterra Stormceptor® EF Sizing Report software. The STC EF-4 unit selected results in a 77% T.S.S. removal rate, exceeding the required 70% T.S.S removal rate. This sizing report and an Owner's Manual which includes Operation and Maintenance instructions, and an inspection and maintenance log sheet are provided in **Appendix D**.

5. SITE ACCESS & STREET PARKING

Access to the subject property will be provided from Dorchester Road, roughly in line with Stokes Street. Construction of the curbed asphalt driveway entrance and reconstruction of Dorchester Road for servicing connections will be built and/or restored in accordance with the City of Niagara Falls standards and specifications. It should be noted that utility lines that cross the entrance access are relatively low and may conflict with high vehicle traffic. Caution signs should be erected, noting potential overhead conflicts. Any public street parking will require approval from the City of Niagara Falls.

6. EROSION AND SEDIMENT CONTROL PROCEDURES

Topsoil and vegetation will be removed from the majority of the site to accommodate lot grading and construction of all municipal services. The resulting disturbed ground will require sedimentation control measures to prevent silt from reaching the receiving waterbody and the stormwater management facility (during pre-grading operations).

Siltation from surface runoff from the site can be prevented with the use of silt fences placed along the boundaries, where runoff will accumulate. Other localized areas may also require sedimentation control fencing. This would be determined at the construction stage.

It will also be necessary to prevent silt from entering the storm sewer system via street catch basins and rear yard catch basin and ditch inlets. At rear yard catch basin filter cloth material will be placed over the grate and covered with clear stone material. For street catch basins a silt sack or equivalent can be inserted under the grate in the catch basin.

Topsoil stockpiles shall be temporarily seeded to help reduce erosion. Where required, erosion control blankets shall be placed as directed. Precautions should be exercised during all stages of construction activity. Double lined silt fences and/or temporary rock flow check dams may be required at the drainage outlets.

In order to reduce the amount of sediment reaching the street, it is suggested that the grade at the property line be left approximately 200mm below the top of the curb until such time as ground cover is about to be established. This will aid in the settlement of sediment, thus reducing sediment flow to the streets. Should building activity over the entire site not commence soon after the underground servicing and the roadworks are complete, arrangements should be made to temporarily seed those areas not covered with vegetation.

Regular monitoring of the site controls and periodic maintenance will be required to ensure that the erosion and sediment controls remain effective.

All practices shall be in accordance with the “Erosion and Sediment Control Guidelines for Urban Construction”, GGHA CAs, December 2006.

7. CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations of this report concerning sanitary servicing, watermain servicing, grading and stormwater servicing, stormwater management (quantity and quality), and erosion and sediment control for the proposed site development are as follows:

1. The existing 450mm diameter sanitary sewer available in Dorchester Road can be utilized to service the proposed site, accepting a calculated flow of approximately **7.01 L/s**. It is suggested

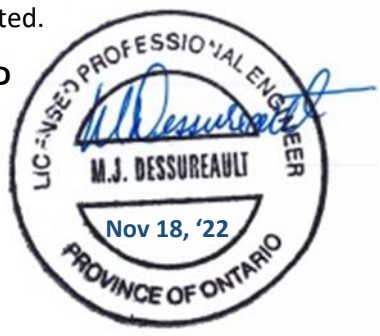
to provide a back up valve within the building as the sewer connects to a combined sewer that has potential for surcharging.

2. The existing 300mm diameter watermain in Dorchester Road will be utilized to service the proposed development.
3. The fire hydrant tested in Dorchester Road, across from the subject site has adequate flow for fire protection. An on-site fire hydrant has also been provided within 45m of the building's fire department connection.
4. The existing 1050mm diameter storm sewer in Dorchester Road will be utilized to service the proposed site, accepting a calculated targeted maximum release flow of approximately **0.053 m^3/s**.
5. The site can be graded to provide a major overland flow route to Dorchester Road with use of retaining walls and berming around the site, greatly minimizing any runoff to adjacent properties.
6. The required stormwater storage for the site = **101 m^3** with **140 m^3** provided. This volume is accomplished through the implementation of a **100mm diameter PVC orifice tube** restricting stormwater release to the municipal sewer system and backing up stormwater on site in piping, structures and in the parking lot.
7. The minimum Quality Control to a **70% T.S.S.** removal rate for the site is achieved with an STC EF-4 providing a **77% T.S.S.** removal rate.
8. On site flooding beyond the 5-year storm event will surcharge the sewer system and flood within the parking lot and be conveyed overland to the Dorchester Road right-of-way, accordingly.
9. Erosion and sediment control measures are proposed to ensure that the amount of silt eroded from the subject development during rainfall events is kept to a minimum.
10. The servicing and stormwater management concept presented in this report shall be adopted as a basis for the detailed engineering design.

We conclude that the subject property can be serviced for the proposed development in accordance with the requirements of the City of Niagara Falls and Niagara Region.

All of which is respectfully submitted.

A.J. CLARKE AND ASSOCIATES LTD



Michael Dessureault, P.Eng.

APPENDIX A:

A-101: Site Plan

Sheet 1: Signed Topographic Survey

Cover Sheet

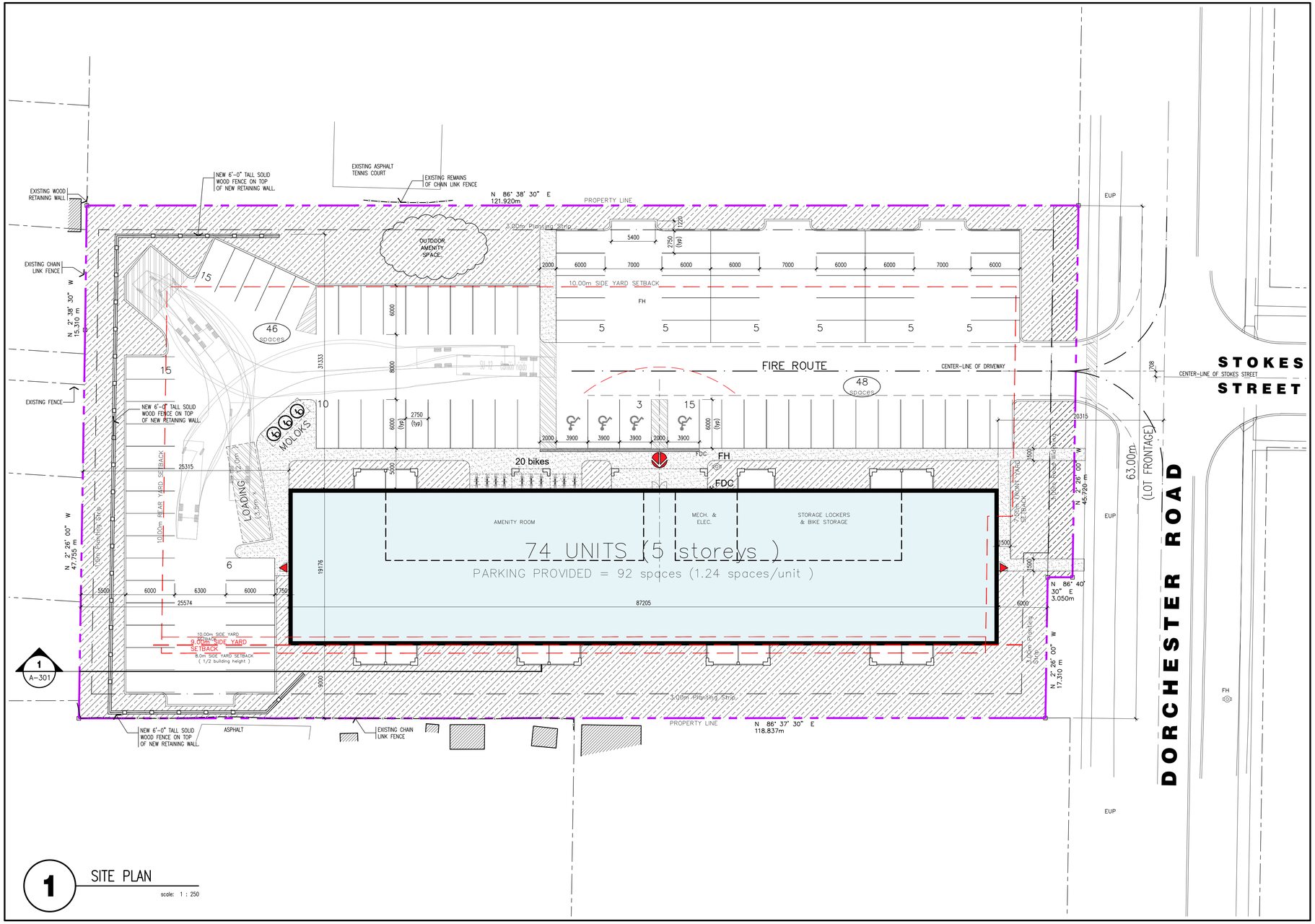
Sheet A: Detail Sheet

Sheet 1: Servicing Plan

Sheet 2: Grading Plan

Sheet 3: Erosion & Sediment Control Plan

Sheet 4: Storm Drainage Area Plan



1 SITE PLAN

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LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- BUILDING SETBACK LINE
- LANDSCAPE BUFFER STRIP
- LINE OF ROAD WIDENING
- FIRE ROUTE — CENTER LINE OF TRUCK ACCESS ROUTE with 12.0 m TURNING RADIUS.
- NEW SOLID WOOD FENCE
- EXISTING CHAIN LINK FENCE
- AREA OF LANDSCAPING
- PAINTED LINES
- NEW CONCRETE SIDEWALK
- MAIN ENTRANCE
- EXIT / ENTRANCE
- BARRIER CURB
- BIKE PARKING
- MOLOK (GARBAGE BINS)
- FH NEW FIRE HYDRANT
- EUP EXISTING UTILITY POLE
- EXISTING BELL PEDESTAL
- FDC FIRE DEPARTMENT CONNECTION

STANDARD PARKING SPACE: 6.00m x 2.75m with 7.00m AISLE

ACCESSIBLE PARKING SPACE: 3.90m x 6.00m with 7.00m AISLE

R.5C RESIDENTIAL

REGULATIONS	REQUIRED	PROVIDED	CONFORMS
MINIMUM LOT AREA (NET AREA EXCLUDES 3.05m ROAD WIDENING)	7600.0 m² (0.76 Ha)	TOTAL LOT AREA= 7,630.9 m² (0.7630 Ha)	YES
		NET LOT AREA= 7,493.0 m² (0.7493 Ha)	NO
MINIMUM LOT AREA / DWELLING UNIT	100 m² / DWELLING UNIT	100 m² / DWELLING UNIT	YES
MINIMUM LOT FRONTAGE	30.0 m	66.08m (DORCHESTER RD)	YES
MINIMUM FRONT YARD	7.50 m	6.0 m	NO
MINIMUM EXTERIOR SIDE YARD	NOT APPLICABLE	NOT APPLICABLE	YES
MINIMUM INTERIOR SIDE YARD	1/2 BUILDING HEIGHT = 8.30 m	9.0 m	YES
MINIMUM REAR YARD	10.0 m	25.57 m	YES
MAXIMUM BUILDING HEIGHT	19.0 m	16.60 m	YES
MAXIMUM BUILDING COVERAGE (% OF LOT AREA)	30 % (2287.8m²) (BLDG AREA = 1672.2 m²)	21.2 % FOR TOTAL LOT AREA 22.3 % FOR NET LOT AREA	YES
MINIMUM LANDSCAPE OPEN SPACE (% OF LOT AREA)	40 % (3050.4m²) (INCLUDES SIDEWALKS)	33.5 % FOR TOTAL LOT AREA (AREA = 2557.85 m²) 32.6 % FOR NET LOT AREA (AREA = 2448.14 m²)	NO
ROAD ALLOWANCE REQUIREMENTS (DORCHESTER RD, FROM MOUNTAIN RD TO MCLEOD RD.)	MINIMUM DISTANCE FROM CENTRELINE OF ORIGINAL ROAD ALLOWANCE = 13m	20.32 m	YES

OFF-STREET PARKING

ZONING REGULATION	REQUIRED	PROVIDED	COMPLIANCE
PARKING REQUIREMENTS: 1.4 spaces/unit	TOTAL 104 spaces REQUIRED (for 74 units)	94 spaces (= 1.27 spaces/unit)	NO
PARKING DIMENSIONS	2.75m X 6.00m	2.75m X 6.00m	YES
ACCESSIBLE PARKING REQUIREMENTS	2 spaces	4 spaces	YES
ACCESSIBLE PARKING DIMENSIONS	3.9m x 6.0m	3.9m x 6.0m	YES
MINIMUM WIDTH OF DRIVEWAYS AND PARKING AISLES	6.30 m	6.30m	YES
MINIMUM BIKE PARKING	0.25 bike spaces / unit = 19 spaces	20 bike spaces	YES

SURVEY NOTE:

THE INFORMATION AND SURVEY LAYOUT USED IN THE PREPARATION OF THIS DRAWING HAS BEEN TAKEN FROM:

PLAN OF SURVEY WITH TOPOGRAPHIC INFORMATION, DATED MAY 26, 2021
FOR PART OF STAMFORD TOWNSHIP LOT 148, CITY OF NIAGARA FALLS, REGIONAL MUNICIPALITY OF NIAGARA
PREPARED BY J.D. BARNES LIMITED, PROJECT No. 21-16-100-00

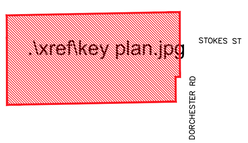
AND

GOOGLE EARTH IMAGES FOR EXISTING ADJACENT CONDITIONS. LOCATION OF STOKES STREET TO BE CONFIRMED.

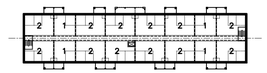
AND

PLAN OF SURVEY WITH TOPOGRAPHIC INFORMATION,
CADD FILE NAME "20-16-100-00-TOPO with 16-16-262.dwg"
PREPARED BY J.D. BARNES LIMITED, PROJECT No. 21-16-100-00
(FOR LOCATION OF STOKES STREET)

KEY MAP



FLOOR PLANS



16 units/floor
2nd, 3rd, 4th, 5th levels
= 64 units
(16 – 1 bdrm, 48 – 2

10 units
(2 – 1 bdrm, 8 – 2 bdrm)
+ M & E room
+ entrance
+ amenity space

TOTAL = 74 units
1–Bedroom Units = 18
2–Bedroom Units =

No.	REVISIONS	date
04	RE-ISSUED FOR ZONING AMENDMENT	22.07.27
03	RE-ISSUED FOR ZONING AMENDMENT	21.12.13
02	ISSUED FOR REVIEW	21.11.11
01	ISSUED FOR ZONING AMENDMENT	21.06.10

PROJECT NORTH

TRUE NORTH

scale 1: 250

drawn CRT
last worked on 2022.07.25 by CRT
checked BRJ
print date 22.07.27

.\Logos\BJC_Logo(900x900 Pixels)RGB.jpg

client
PANORAMIC PROPERTIES INC.

9582 BEAVERDAMS ROAD
NIAGARA FALLS ONTARIO

project
5 STOREY APARTMENT BUILDING

(NIAGARA FALLS)

2659 DORCHESTER ROAD
NIAGARA FALLS ONTARIO

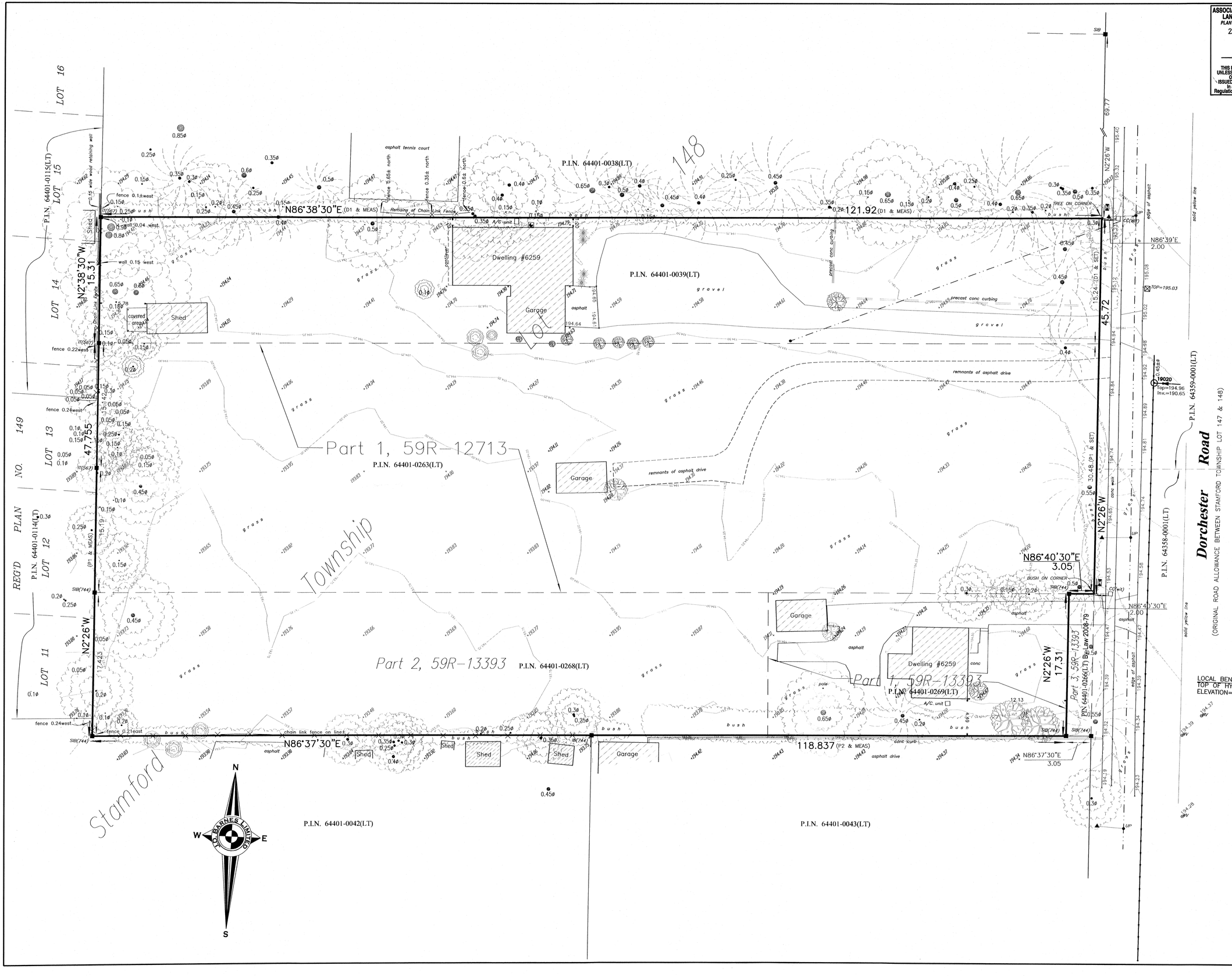
drawing title
SITE PLAN

reference

project no. 21-023

client reference number

sheet no. A-101 04



ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2161165

THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR In accordance with Regulation 1026, Section 29(3).

Plan of Survey with topographic information of

Part of Stamford Township Lot 148

being in the

City of Niagara Falls

REGIONAL MUNICIPALITY OF NIAGARA

J.D. BARNES LIMITED

5 0 5 10 METRES
1 : 200

2021

THE FIELD WORK REPRESENTED ON THIS SKETCH WAS COMPLETED May 18, 2021

May 26, 2021
DATE

ALLAN J. HEYWOOD
Ontario Land Surveyor

J.D. BARNES LIMITED
SURVEYING MAPPING GIS
LAND INFORMATION SPECIALISTS
4318 PORTAGE ROAD, UNIT 2, NIAGARA FALLS, ON L2E 6A4
Niagara Falls (905) 356-3661 St. Catharines (905) 687-5566 www.jdbarnes.com

Rev#	Date	Remarks
0	May 25, 2021	first release

METRIC NOTE
DISTANCES AND ELEVATIONS SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

ELEVATION NOTE
ELEVATIONS ARE OF GEODETIC ORIGIN (CGVD-1928:78), DERIVED FROM GNSS OBSERVATIONS AND NATIONAL RESOURCES CANADA'S GEOID MODEL HT2.0 .

BEARING NOTE
BEARINGS SHOWN HEREON ARE GRID BEARINGS DERIVED FROM REAL-TIME NETWORK OBSERVATIONS (SmartNet v6-2014), AND ARE REFERRED TO THE CENTRAL MERIDIAN 81°W OF UTM ZONE 17, NAD83 (CSRS2010)

BEARING COMPARISONS: SEE LEGEND FOR AZIMUTH ROTATIONS APPLIED TO BEARINGS ON COMPARED SOURCES.

LEGEND (All symbols may or may not be shown)

LS	denotes	Light Standard		denotes	Borehole
	"	Catch Basin		"	Bench
	"	Manhole		"	Ground Light
195.00	"	Spot Elevation(metres) (x denotes location)		"	Hosebib
	"	Traffic Sign		"	Electrical Outlet
	"	Pole	RR	"	Railway Signal
	"	Bell Pedestal		"	Railway Switch
	"	Cable Pedestal		"	Sprinkler
	"	Hydrant		"	Parking Meter
	"	Guy Wire Anchor		"	Cleanout
	"	Gas Meter		"	Flag Pole
	"	Junction Box		"	Water Well
	"	Coniferous Tree		"	Binoculars
and/or	"	Deciduous Tree		"	Hydro Meter
	"	Shrub		"	Round Floor Drain
	"	Tree Stump		"	Square Floor Drain
	"	Building		"	Square Post
				"	Monitoring Well

WV	denotes	Water Valve
GV	"	Gas Valve
TL	"	Traffic Light
BD	"	Bollard
HP	"	Hydro Pole
BP	"	Bell Pole
UP	"	Utility Pole

FENCE
UNDETERMINED OVERHEAD SERVICE LINE(S)
PROPERTY LINE
EASEMENT/RIGHT-OF-WAY/LEASE LINE

Line Descriptors

BELL	denotes	UNDERGROUND BELL
OHBELL	"	OVERHEAD BELL
UGCTV	"	UNDERGROUND CABLE TV
OHCTV	"	OVERHEAD CABLE TV
UGHYD	"	UNDERGROUND HYDRO
OHHYD	"	OVERHEAD HYDRO
WAT	"	UNDERGROUND WATER
GAS	"	UNDERGROUND GAS

⊕	denotes	SURVEY MONUMENT FOUND
SIB	"	SURVEY MONUMENT SET IRON BAR
SSIB	"	STANDARD IRON BAR
SSIB	"	ROUND STANDARD IRON BAR
CP	"	CONCRETE PIN & WASHER
PB	"	PLASTIC BAR
RB	"	ROCK BAR
RPL	"	ROCK PLUG
IB2	"	ROUND IRON BAR
SIB9	"	ROUND STANDARD IRON BAR
CM	"	CONCRETE MONUMENT
SM	"	STONE MONUMENT
IT	"	IRON TUBE
CC (wit)	"	CUT CROSS WITNESS
744 or JDB	"	J.D. BARNES LIMITED

P1	denotes	59R-12713 (Az.=1°20'30")
P2	"	59R-13393 (Az.=3°20'30")
D1	"	INST.745232

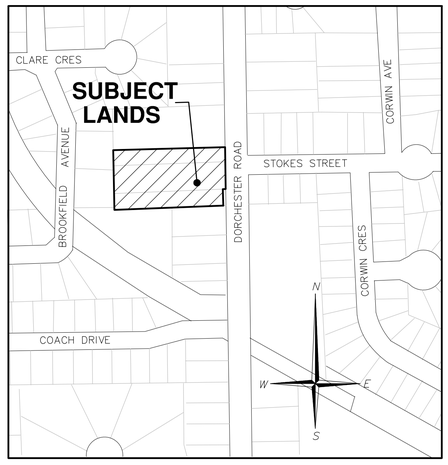
N = North / S = South / E = East / W = West / meas = measure / prop = proportion

CAUTION
PRIOR TO CONSTRUCTION CONTRACTOR SHALL VERIFY & CONFIRM LOCATION OF APPURTENANT FEATURES.

Ref: 21-16-100-00 | 1:200 | Sheet 1

Coord System: JDB UTM 51-NAD83 / SmartNet v6-2014

CITY OF NIAGARA FALLS



KEY PLAN
N.T.S.

6259 & 6293 DORCHESTER ROAD
PROPOSED 5 STOREY APARTMENT BUILDING

2nd SUBMISSION: NOVEMBER 18, 2022
AJC PROJECT # 201239

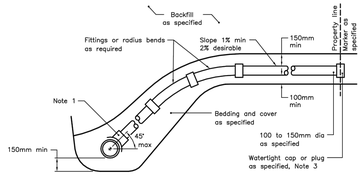
LIST OF DRAWINGS

GENERAL

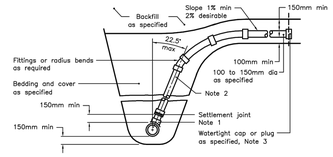
PANORAMIC PROPERTIES INC.

A. J. Clarke and Associates Ltd.
SURVEYORS • PLANNERS • ENGINEERS
25 MAIN STREET WEST, SUITE 300
HAMILTON, ONTARIO L8P 1H1
Tel: (905) 528-8761 Fax: (905) 528-2289
email: ajc@ajclarke.com

6259 & 6293 DORCHESTER ROAD



CONNECTION WITHOUT VERTICAL RISER

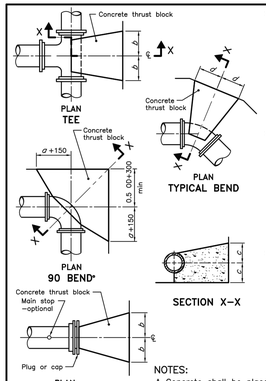


CONNECTION WITH VERTICAL RISER

NOTES:
1 Sewer service connections to the main pipe sewer shall be made using factory made tees, strap-on-saddles, or other approved saddles.
2 Vertical risers shall be as specified.
3 Cap or plug at property line shall be adequately braced.

A Maintenance holes shall be used at the main sewer to connect service connections greater than or equal to 200mm.
B For new construction, saddles shall be installed on the main pipe before that pipe is laid.
C Approved cut-in tool shall be used for field made connections.
D All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2016	Rev 3
SEWER SERVICE CONNECTIONS FOR MAIN PIPE SEWER		OPSD 1006.010



SOILS WITH TYPICAL BEARING STRENGTH OF 100 TO 199 kPa

PIPE	Dimensions			
DIA	a	b	c	d
100	150	250	200	200
150	250	400	250	300
200	400	550	300	450
250	500	650	400	500
300	650	800	450	650
350	700	900	550	700
400	900	1050	600	850

SOILS WITH TYPICAL BEARING STRENGTH OF 200 TO 299 kPa

PIPE	Dimensions			
DIA	a	b	c	d
100	150	200	150	150
150	250	250	200	200
200	400	350	250	300
250	500	450	300	350
300	650	500	350	400
350	700	600	400	500
400	900	750	400	600

SOILS WITH TYPICAL BEARING STRENGTH OF 300 kPa AND OVER

PIPE	Dimensions			
DIA	a	b	c	d
100	150	150	150	150
150	250	200	200	200
200	400	300	200	250
250	500	400	250	300
300	650	450	300	300
350	700	550	350	350
400	900	650	350	450

NOTES:
A Concrete shall be placed to within 50mm of the face of the bell.
B Bond breaker shall be used between concrete and fittings.
C The above thrust block dimensions meet or exceed the MECP Watermain Design Criteria for Future Alterations Authorized Under a Drinking Water Works Permit.
D The assumptions made for the above calculations are:
– Maximum operating pressure of 690 kPa,
– Maximum surge pressure with a flow velocity change of 0.6 m/s of 790 kPa for Class 52 DI pipe and 240 kPa for PVC pipe.
E The tables apply to both ductile iron and PVC pipe. When one length exceeded the other, the longer length was used.
F All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 3
CONCRETE THRUST BLOCKS FOR TEES, PLUGS, AND HORIZONTAL BENDS		OPSD 1103.010

SOILS WITH TYPICAL BEARING STRENGTH OF 100 TO 199 kPa

PIPE	Note 1				
DIA	a	b	c	d	e
100	450	600	750	13	150
150	600	900	900	13	300
200	600	900	1500	13	450
250	900	900	1500	20	600
300	1200	900	1650	20	800
350	1200	1200	1650	25	1000
400	1300	1300	1750	30	1000

SOILS WITH TYPICAL BEARING STRENGTH OF 200 TO 299 kPa

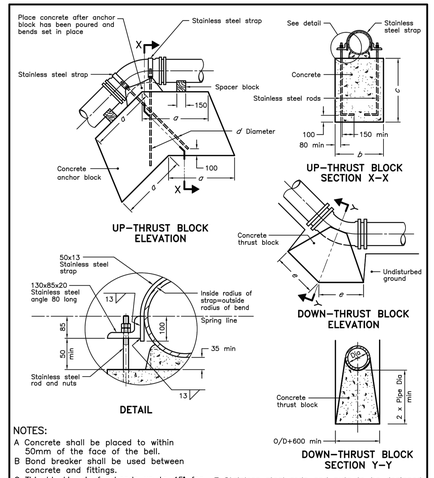
PIPE	Note 1				
DIA	a	b	c	d	e
100	450	600	750	13	150
150	600	900	900	13	300
200	600	900	1500	13	450
250	900	900	1500	20	600
300	1200	900	1650	20	800
350	1200	1200	1650	25	1000
400	1300	1300	1750	30	1000

SOILS WITH TYPICAL BEARING STRENGTH OF 300 kPa AND OVER

PIPE	Note 1				
DIA	a	b	c	d	e
100	450	600	750	13	150
150	600	900	900	13	300
200	600	900	1500	13	450
250	900	900	1500	20	600
300	1200	900	1650	20	800
350	1200	1200	1650	25	1000
400	1000	1300	1750	30	1000

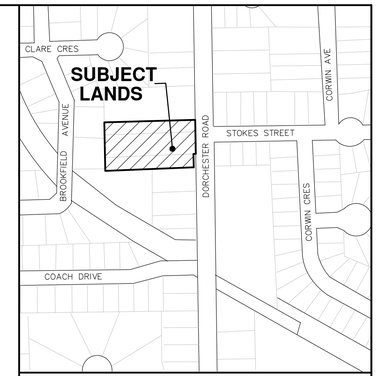
NOTES:
1 The dimensions are as specified in OPSD 1103.020.
A The above thrust block dimensions meet or exceed the MECP Watermain Design Criteria for Future Alterations Authorized Under a Drinking Water Works Permit.
B The assumptions made for the above calculations are as follows:
– Maximum operating pressure of 690 kPa,
– Maximum surge pressure with a flow velocity change of 0.6 m/s of 790 kPa for Class 52 DI pipe and 240 kPa for PVC pipe.
C The tables apply to both ductile iron and PVC pipe. When one length exceeded the other, the longer length was used.
D This OPSD shall be read in conjunction with OPSD 1103.020.
E All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 1
DIMENSION TABLES FOR CONCRETE THRUST BLOCKS FOR VERTICAL BENDS		OPSD 1103.021



NOTES:
A Concrete shall be placed to within 50mm of the face of the bell.
B Bond breaker shall be used between concrete and fittings.
C This blocking is for bends up to 45° for up-thrust and 90° for down-thrust.
D This OPSD shall be read in conjunction with OPSD 1103.021.
E All stainless steel to be type 316.
F Stainless steel rods and nuts to be designed based on actual watermain diameter and surge pressure.
G All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 4
CONCRETE THRUST BLOCKS FOR VERTICAL BENDS		OPSD 1103.020



KEY PLAN N.T.S.

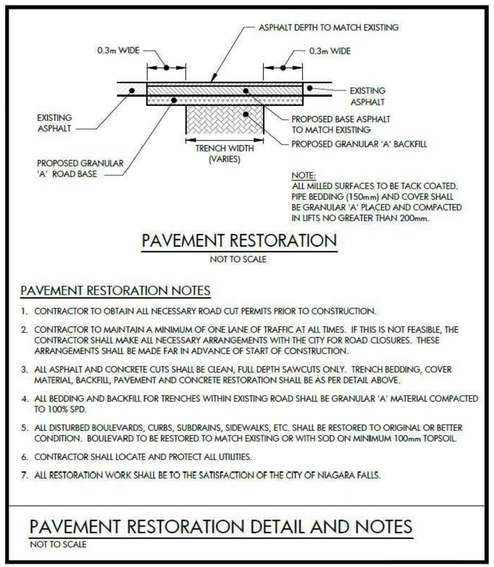
BENCH MARK
Elevation: 195.035
Description: Top of existing Fire Hydrant, located east of Dorchester Road adjacent to the south east corner of 2659 Dorchester Road.

Note
Topographic information was received from J.B.Barnes Limited dating May 26, 2021.

No.	Revision	By	Date
2.	SECOND SUBMISSION	M.D.	NOV. 18, 2022
1.	FIRST SUBMISSION	M.D.	NOV. 03, 2021

REVISIONS

GENERAL NOTES
1 TENDERERS SHALL SATISFY THEMSELVES AS TO THE NATURE OF THE GROUND AND BID ACCORDINGLY.
2 ALL ROCK LINE INDICATIONS SHOWN ON THE PLAN MUST BE VERIFIED BY THE CONTRACTOR.
3 CONTRACTOR SHALL VERIFY LOCATIONS AND INVERTS OF ALL EXISTING SANITARY AND STORM SEWERS AND WATERMAINS, PRIVATE SEWER DRAINS AND WATER SERVICES, GASMAINS, CABLE TV, HYDRO AND TELEPHONE DUCTS, ETC., AT START OF CONSTRUCTION.

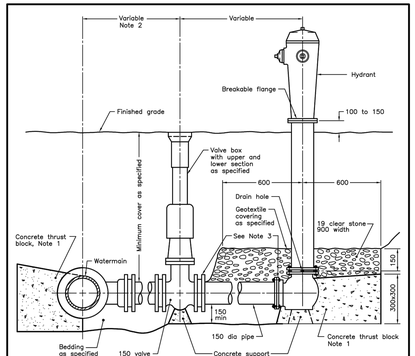


NOTE:
ALL MILLED SURFACES TO BE TACK COATED.
PIPE BEDDING (150mm) AND COVER SHALL BE GRANULAR 'A' PLACED AND COMPACTED IN LIFTS NO GREATER THAN 200mm.

PAVEMENT RESTORATION
NOT TO SCALE

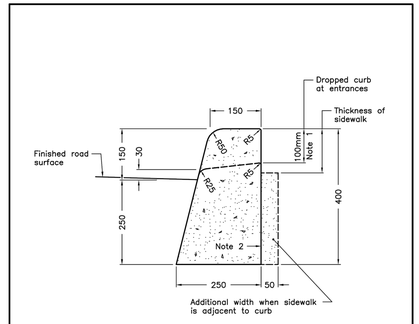
PAVEMENT RESTORATION NOTES
1. CONTRACTOR TO OBTAIN ALL NECESSARY ROAD CUT PERMITS PRIOR TO CONSTRUCTION.
2. CONTRACTOR TO MAINTAIN A MINIMUM OF ONE LANE OF TRAFFIC AT ALL TIMES. IF THIS IS NOT FEASIBLE, THE CONTRACTOR SHALL MAKE ALL NECESSARY ARRANGEMENTS WITH THE CITY FOR ROAD CLOSURES. THESE ARRANGEMENTS SHALL BE MADE FAR IN ADVANCE OF START OF CONSTRUCTION.
3. ALL ASPHALT AND CONCRETE CUTS SHALL BE CLEAN, FULL DEPTH SAWCUTS ONLY. TRENCH BEDDING, COVER MATERIAL, BACKFILL, PAVEMENT AND CONCRETE RESTORATION SHALL BE AS PER DETAIL ABOVE.
4. ALL BEDDING AND BACKFILL FOR TRENCHES WITHIN EXISTING ROAD SHALL BE GRANULAR 'A' MATERIAL COMPACTED TO 100% SPD.
5. ALL DISTURBED BOULEVARDS, CURBS, SUBDRAINS, SIDEWALKS, ETC. SHALL BE RESTORED TO ORIGINAL OR BETTER CONDITION. BOULEVARD TO BE RESTORED TO MATCH EXISTING OR WITH SOD ON MINIMUM 100mm TOPSOIL.
6. CONTRACTOR SHALL LOCATE AND PROTECT ALL UTILITIES.
7. ALL RESTORATION WORK SHALL BE TO THE SATISFACTION OF THE CITY OF NIAGARA FALLS.

PAVEMENT RESTORATION DETAIL AND NOTES
NOT TO SCALE



NOTES:
1 All concrete thrust blocks shall be poured against undisturbed ground.
2 When specified, for watermains 400mm and less, locate valve within 1.0m of centreline of watermain. Retaining and restraining devices shall be utilized. For watermains 600mm and over, bolt valve with flanged end directly to flanged tee.
3 Retaining and restraining devices shall be as specified.
A Bond breaker shall be used between the concrete and the fittings and appurtenances.
B Bolts and nuts for buried flange to flange connections shall be stainless steel.
C When required, flange of standpipe extensions shall not be in frost zone.
D This OPSD shall be read in conjunction with OPSD 1103.010 and 1103.020.
E Backfill material within 500mm of service box shall be native or imported, as specified.
F Tracer wire shall be installed as specified.
G All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 3
HYDRANT INSTALLATION		OPSD 1105.010



NOTES:
1 When sidewalk is continuously adjacent, the dropped curb at entrances shall be reduced to 75mm.
2 For slipforming procedure a 5% batter is acceptable.
A Treatment at entrances shall be according to OPSD 351.010.
B Outlet treatment shall be according to the OPSD 610 Series.
C The transition from one curb type to another shall be a minimum length of 3.0m, except in conjunction with guide rail where it shall be according to the OPSD 900 Series.
D All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2012	Rev 2
CONCRETE BARRIER CURB		OPSD 600.110

M.J. DESSUREAULT
Nov. 18, 2022
LICENSED PROFESSIONAL ENGINEER
PROVINCE OF ONTARIO
ENGINEER

PROJECT OWNER:
PANORAMIC PROPERTIES INC.

NOT ISSUED FOR CONSTRUCTION

MUNICIPALITY:
CITY OF NIAGARA FALLS (STAMFORD TOWNSHIP)

PROJECT NAME:
PROPOSED
5 STOREY APARTMENT BUILDING
6259 & 6293 DORCHESTER ROAD
NIAGARA FALLS

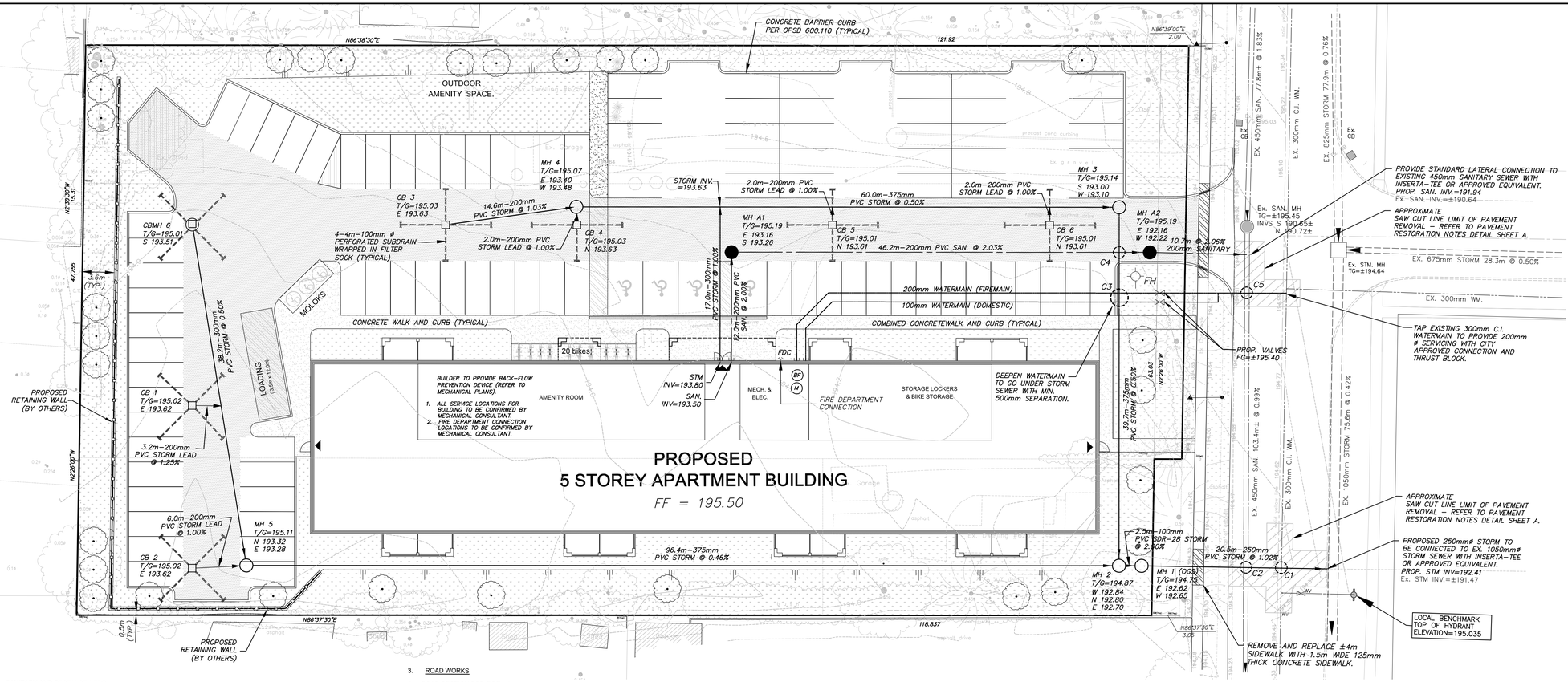
A. J. Clarke and Associates Ltd.
SURVEYORS • PLANNERS • ENGINEERS
25 MAIN STREET WEST, SUITE 300
HAMILTON, ONTARIO L8P 1H1
Tel: 905 528-8761 Fax: 905 528-2289
email: ajc@ajclarke.com

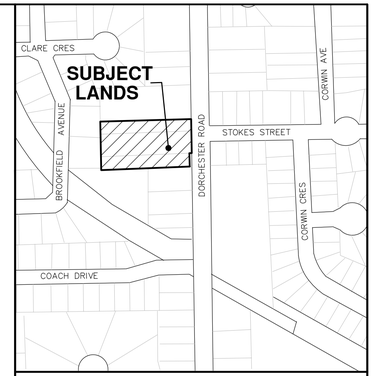
TITLE:
DETAIL SHEET

SCALE:	DATE: JULY, 2021
DESIGN: M.D./M.M.	DRAWN: S.S./M.M./T.L.
DWG: 201239	SHT: A

6259 & 6293 DORCHESTER ROAD
H:\Jobs\2020 Projects\201239 (Dorchester, Niagara Falls)\Engineering\Design\Current\BASEPLAN.dwg 11/2/2021 4:40 PM THE LAM

6259 & 6293 DORCHESTER ROAD





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3 CONTRACTOR SHALL VERIFY LOCATIONS AND INVERTS OF ALL EXISTING SANITARY AND STORM SEWERS AND WATERMAINS, PRIVATE SEWER DRAINS AND WATER SERVICES, GASMAINS, CABLE TV, HYDRO AND TELEPHONE DUCTS, ETC., AT START OF CONSTRUCTION.

1. SANITARY AND STORM SEWERS

A. CONSTRUCTION OF SANITARY & STORM SEWERS & PRIVATE DRAINS SHALL BE IN ACCORDANCE WITH CITY STANDARDS & SPECIFICATIONS (LATEST EDITION) AND MINISTRY OF ENVIRONMENT CONSERVATION AND PARKS (MECP) GUIDELINES (LATEST EDITION).

B. SANITARY SEWERS SHALL BE PVC PIPE, CSA B182.2 SDR-35.

C. PVC STORM SEWERS SHALL BE AS PER, CSA B182.2, SDR-35.

D. REINFORCED CONCRETE PIPE (RCP) STORM SEWERS SHALL BE AS PER CSA A257.2, 100-D MINIMUM.

E. COVER AND BEDDING MATERIAL FOR PVC PIPE SHALL BE GRANULAR 'A' MATERIAL AS PER OPSD 802.010 OR 802.013.

F. PVC PIPE WILL REQUIRE SPECIAL CONSTRUCTION PROCEDURES AS PER CITY SPECIFICATIONS.

G. MANHOLES SHALL BE AS PER OPSD 700.010 UNLESS OTHERWISE SPECIFIED.

H. MANHOLE FRAMES AND COVERS SHALL BE AS PER OPSD 401.010 (STORM-OPEN, SANITARY-CLOSED).

I. CATCH BASIN / DOUBLE CATCH BASIN SHALL BE AS PER OPSD 705.010 & 705.020 RESPECTIVELY.

J. CATCH BASIN FRAME AND GRATE SHALL BE AS PER OPSD 400.100.

K. CATCH BASIN CONNECTIONS TO BE 200mm DIA. PVC PIPE CSA B182.2, SDR-35 AND ARE TO BE INSTALLED WITH MIN. 1.0% SLOPE UNLESS OTHERWISE SPECIFIED.

L. ALL SEWERS TO BE FLUSHED PRIOR TO VIDEO INSPECTION.

M. PVC (SANITARY AND STORM) SEWERS ARE TO BE TESTED FOR DEFLECTION (MANDREL PASSAGE) AFTER INSTALLATION. SANITARY SEWERS SHALL BE TESTED FOR LEAKAGE (LOW AIR PRESSURE).

N. ALTERNATE MATERIALS MAY BE ACCEPTABLE PROVIDED APPROVAL HAS FIRST BEEN OBTAINED FROM THE CITY/ENGINEER

O. MANHOLES AND CATCH BASINS SHALL BE INSTALLED FLUSH WITH THE TOP COURSE ASPHALT.

P. MANHOLES AND CATCH-BASINS TO BE ADJUSTED TO MATCH FINAL LIFT OF ASPHALT AT TIME OF FINAL ASPHALT PLACEMENT. FOR MANHOLE AND CATCH BASIN TOP ADJUSTMENTS, ALL PERMANENT ADJUSTMENTS ARE TO BE PRE-CAST ADJUSTMENT UNITS AND ADJUSTABLE MANHOLE COVERS (MANUFACTURED BE BIBBY-STE-CROIX, MODEL C-50-ONT, CIP) OR EQUIVALENT.

2. WATER SERVICES

A. CONSTRUCTION OF WATERMAINS & PRIVATE SERVICES SHALL BE IN ACCORDANCE WITH CITY STANDARDS & SPECIFICATIONS (LATEST EDITION) AND MINISTRY OF ENVIRONMENT CONSERVATION AND PARKS (MECP) GUIDELINES (LATEST EDITION).

B. WATERMAIN SHALL BE INSTALLED WITH MIN. 1.8m COVER.

C. WATERMAIN SHALL BE CLASS 150 DR18 CONFORMING TO AWWA C900.

D. TRACER WIRE SHALL BE INSTALLED WITH PVC PIPE. IT SHALL BE 12 GAUGE TW75, TWU75 OR RW90XLPE COATED COPPER AND SHALL BE POSITIONED ALONG THE TOP OF THE PIPE AND FASTENED AT 6 METRE INTERVALS. THE WIRE IS TO BE INSTALLED BETWEEN EACH VALVE AND/OR THE END OF THE NEW PVC WATERMAIN. JOINTS IN THE WIRE BETWEEN VALVES ARE NOT PERMITTED. AT EACH GATE VALVE A LOOP WIRE IS TO BE BROUGHT UP INSIDE THE VALVE BOX TO THE CAP. THE TRACER WIRE IS TO BE BROUGHT TO THE SURFACE AT SECONDARY VALVE ON ALL FIRE HYDRANTS. THE TRACER WIRE SHALL ALSO BE CONNECTED TO THE CATHODIC PROTECTION SYSTEM AS REQUIRED.

E. MOLDED PVC FITTINGS FOR PIPE SIZES 100mm TO 300mm SHALL CONFORM TO AWWA C900 AND CERTIFIED TO CSA B137.2.

F. BEDDING AND BACKFILL SHALL BE GRANULAR 'A' MATERIAL FOR MAINS AND SERVICES GREATER THAN 50mm.

G. WATERMAIN DEFLECTION FOR PVC PIPE:
   I. MAXIMUM ALLOWABLE DEFLECTION OF 1.5 DEGREES PER JOINT UP TO 250mm DIAMETER (USE MAX = ½ OF MANUFACTURER'S RECOMMENDATION).
   II. ALL JOINTS SHALL BE DEFLECTED AN EQUAL AMOUNT.

H. MINIMUM HORIZONTAL CLEARANCE BETWEEN WATERMAIN AND STORM / SANITARY SEWERS = 2.5m.

I. MINIMUM VERTICAL CLEARANCE BETWEEN WATERMAIN AND STORM OR SANITARY SEWER SHALL BE MINIMUM 0.50m AT ALL CROSSINGS.

J. ALL VALVE BOXES TO BE SET TO PROPOSED GRADES.

K. 100mm TO 350mm GATE VALVE & VALVE BOXES AS PER OPSD 1100.011

L. FOR 100mm TO 300mm WATERMAINS STANDARD CONCRETE ANCHOR BLOCKS AS PER OPSD 1103.010 AND OPSD 1006.010 FOR HORIZONTAL AND VERTICAL BENDS RESPECTIVELY.

3. ROAD WORKS

A. ROAD SECTION FOR FIRE ROUTE:
OPSS 40mm HL 3 COMPACTED 97% MARSHALL, OPSS 65mm HL 8 COMPACTED 97% MARSHALL, ON 150mm COMPACTED OPSS GRANULAR 'A' & 450mm COMPACTED OPSS GRANULAR 'B' TYPE II.

B. ROAD SECTION FOR PARKING AREAS:
65mm OPSS HL 3 COMPACTED 97% MARSHALL, ON 150mm COMPACTED OPSS GRANULAR 'A' & 300mm COMPACTED OPSS GRANULAR 'B' TYPE II.

C. DRIVEWAY APPROACH SHALL BE INSTALLED AS PER NPSCD B15 STANDARDS.

D. CONCRETE CURB SHALL BE AS PER OPSD 600.110 (BARRIER-TYPE), MIN 30 MPa STRENGTH, (50mm KEY TO BE PROVIDED AS REQUIRED)

E. CONCRETE SIDEWALK SHALL BE AS PER OPSD 310.010 IN CITY R.O.W.

F. 100mm FILTER WRAPPED CORRUGATED PERFORATED SUBDRAINS TO BE INSTALLED AS SHOWN AT ALL CATCHBASINS AND CATCHBASIN MANHOLES AND CONNECTED TO THE CBS AS PER NPSCD B6 STANDARD.

4. COMPACTION REQUIREMENTS

A. ALL BEDDING AND BACKFILL MATERIAL, ROAD SUB-GRADES, AND GENERALLY ALL MATERIAL USED FOR LOT GRADING AND FILL SECTIONS ETC., SHALL BE COMPACTED TO 100% SPD UNLESS OTHERWISE SPECIFIED.

B. ALL GRANULAR ROAD BASE MATERIALS SHALL BE COMPACTED TO 100% SPD.

C. FOR ALL SEWERS AND WATERMAINS IN FILL SECTIONS, THE COMPACTION SHALL BE VERIFIED PRIOR TO LAYING OF PIPE.

5 CITY RIGHT-OF-WAY RESTORATIONS

A. ALL DISTURBED CURBS, BOULEVARD AND UTILITIES SHALL BE RESTORED TO SUIT ORIGINAL CONDITIONS OR BETTER.

B. THROUGH ACCESS TO BE MAINTAINED AT ALL TIMES.

C. CONTRACTOR SHALL PROVIDE DETOUR SIGNS AS REQUESTED BY CITY OF NIAGARA FALLS AS REQUIRED.

D. ALL WORKS SHALL BE TO THE SATISFACTION OF THE NIAGARA FALLS.

SPECIAL NOTES

SN1. EXISTING UTILITIES AND UNDERGROUND SERVICES SHOWN ARE APPROXIMATE LOCATIONS ONLY. THIS DRAWING DOES NOT INDICATE ALL POTENTIAL UTILITIES AND SERVICES. CONTRACTOR IS RESPONSIBLE TO HAVE ALL UTILITIES AND SERVICES STAKED OUT BY THEIR RESPECTIVE LOCATE AND SERVICING COMPANIES PRIOR TO COMMENCING WORK ON SITE.

SN2. ALL EXISTING UTILITIES, SERVICES, AND STRUCTURES, ETC. THAT ARE IN CONFLICT WITH PROPOSED SITE SERVICES, TO BE RELOCATED BY OTHERS, UNLESS OTHERWISE INDICATED.

SN3. REMOVALS AND/OR RELOCATIONS OF THE EXISTING UTILITIES (I.E. HYDRO, COMMUNICATION, FIBER OPTIC CABLES, GAS, ETC.,) SHALL BE IN STRICT ACCORDANCE WITH THE APPROVED AND "ISSUED FOR CONSTRUCTION" DRAWINGS PREPARED BY QUALIFIED PROFESSIONAL.

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE NOTED.

CONTRACTOR TO VERIFY LOCATION AND ELEVATION OF ALL EXISTING SERVICES IN VICINITY OF PROPOSED WORKS PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.

CONTRACTOR TO CLEAN EXISTING ROADWAYS OF SEDIMENTS RESULTING FROM CONSTRUCTION TRAFFIC FROM THE SITE EACH DAY.

ANY WORK PROPOSED WITHIN CITY ROW REQUIRES ROAD OCCUPANCY PERMIT.

ALL BUILDING ROOF DRAINAGE SHALL BE DIRECTED TO THE STORM SEWER LEAD VIA THE INTERNAL MECHANICAL DRAINAGE SYSTEM. WEEPING TILES DRAINAGE SHALL BE TO SUMP PIT AND BE DIRECTED TO THE BUILDING STORM CONNECTION. ALL INTERNAL BUILDING DRAINAGE COMPONENTS SHALL BE CONSTRUCTED AS PER THE REQUIREMENTS OF THE ONTARIO BUILDING CODE.

APPROVAL OF THIS DRAWING IS FOR MATERIAL ACCEPTABILITY AND COMPLIANCE WITH MUNICIPAL AND PROVINCIAL SPECIFICATIONS AND STANDARDS ONLY. APPROVAL AND INSPECTION BY THE CITY OF THE WORKS DOES NOT CERTIFY THE LINE AND GRADE OF THE WORKS AND IT IS THE OWNER'S RESPONSIBILITY TO HAVE THEIR ENGINEER CERTIFY THIS ACCORDINGLY.

IN FUTURE EVENT OF SANITARY PIPE MAINTENANCE/REPAIR, ANY COST RELATED TO STRUCTURE REMOVAL AND REINSTATEMENT SHALL BE THE RESPONSIBILITY OF THE OWNER.

NOTE:
ALL EXISTING SERVICES (WATERMAIN, SANITARY AND STORM SEWER) TO BE REMOVED SHALL BE CAPPED/PLUGGED AT THE EXISTING MAINLINE SERVICE PER THE CITY OF NIAGARA FALLS REQUIREMENTS.

SANITARY MANHOLE SCHEDULE

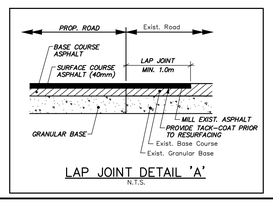
MH	TOP	INVERTS	DESCRIPTION
A1	195.19	S INV=193.26 E INV=193.16	1200mm (OPSD 701.010)
A2	195.19	W INV=192.22 E INV=192.16	1200mm (OPSD 701.010)

STORM MANHOLE SCHEDULE

MH	TOP	INVERTS	DESCRIPTION
CBMH 6	195.01	S INV=193.51	1200mm (OPSD 701.010)
CB 3	195.03	E INV=193.63	600mm x 600mm (OPSD 705.010)
1 (OGS)	194.75	E INV=192.62 W INV=192.65	1200mm STC EF-4
2	194.87	W INV=192.84 N INV=192.80 E INV=192.70	1200mm (OPSD 701.010)
3	195.14	W INV=193.10 S INV=193.00	1200mm (OPSD 701.010)
4	195.07	W INV=193.48 E INV=193.40	1200mm (OPSD 701.010)
5	195.11	N INV=193.32 E INV=193.28	1200mm (OPSD 701.010)

CATCH BASIN SCHEDULE

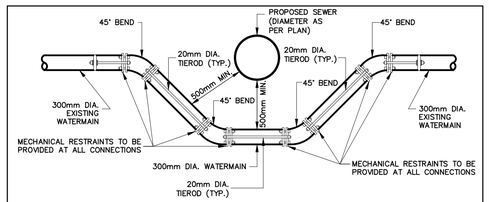
MH	TOP	INVERTS	DESCRIPTION
CB 1	195.02	E INV=193.62	600mm x 600mm (OPSD 705.010)
CB 2	195.02	E INV=193.62	600mm x 600mm (OPSD 705.010)
CB 4	195.03	N INV=193.63	600mm x 600mm (OPSD 705.010)
CB 5	195.01	N INV=193.61	600mm x 600mm (OPSD 705.010)
CB 6	195.01	N INV=193.61	600mm x 600mm (OPSD 705.010)



LAP JOINT DETAIL 'A' N.T.S.

PIPE CROSSING SCHEDULE

CROSSING NO.	BOTTOM OF PIPE	TOP OF PIPE	DIFFERENCE (METERS)	WM LOWERING REQUIRED
C1	±192.46 (STM)	±191.96 (WM)	0.50	YES
C2	±192.51 (STM)	±190.73 (SAN.)	1.78	N/A
C3	±192.94 (STM)	±192.44 (WM)	0.50	YES
C4	±192.97 (STM)	±192.50 (SAN.)	0.47	N/A
C5	±192.20 (WM)	±191.13 (SAN.)	1.07	NO



NOTES:
1. ALL DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE.
2. 20mm DIA. STEEL TIERODS REQUIRED AS SHOWN.
3. COVER TIEBOLT ASSEMBLY WITH DENSO PASTE MASTIC AND TAPE ALL TO MANUFACTURER'S SPECIFICATIONS.
4. MECHANICAL RESTRAINTS TO BE PROPOSED BY CONTRACTOR AND APPROVED BY ENGINEER.

WATERMAIN CROSSING DETAIL N.T.S.

LEGEND

- PROPOSED STORM MANHOLE
- EXISTING STORM MANHOLE
- PROPOSED SANITARY MANHOLE
- EXISTING SANITARY MANHOLE
- PROPOSED WATER VALVE AND BOX/ CURB STOP
- EXIST. WATER VALVE & VALVE BOX
- PROPOSED HYDRANT
- EXISTING HYDRANT
- PROPOSED DEPRESSED CURB
- PROPOSED SANITARY SEWER PIPE
- PROPOSED STORM SEWER PIPE
- PROPOSED CURB
- PROPOSED SIDEWALK
- EXISTING CURB & GUTTER
- CB EXISTING CATCH BASIN
- WATERMAIN TEE (PROPOSED / EXISTING)
- 45° WATERMAIN ELBOW (PROPOSED / EXISTING)
- PLUG (PROPOSED / EXISTING)
- EXISTING WATERMAIN
- EXISTING STORM PIPE
- EXISTING SANITARY SEWER PIPE
- BF BACK–FLOW PREVENTION VALVE
- M WATER METER
- FDC FIRE CONNECTION DEPARTMENT
- PROPOSED SUBDRAIN
- HEAVY DUTY ASPHALT PAVEMENT
- PROPOSED TREES
- EXISTING CONIFEROUS
- EXISTING DECIDUOUS TREE

N

J.C. "JEAN" DESSUREAULT PROFESSIONAL ENGINEER
M.J. DESSUREAULT
Nov. 18, 2022
PROVINCE OF ONTARIO
ENGINEER

PROJECT OWNER:
PANORAMIC PROPERTIES INC.

NOT ISSUED FOR CONSTRUCTION

MUNICIPALITY:
CITY OF NIAGARA FALLS (STAMFORD TOWNSHIP)

PROJECT NAME:
PROPOSED 5 STOREY APARTMENT BUILDING
6259 & 6293 DORCHESTER ROAD
NIAGARA FALLS

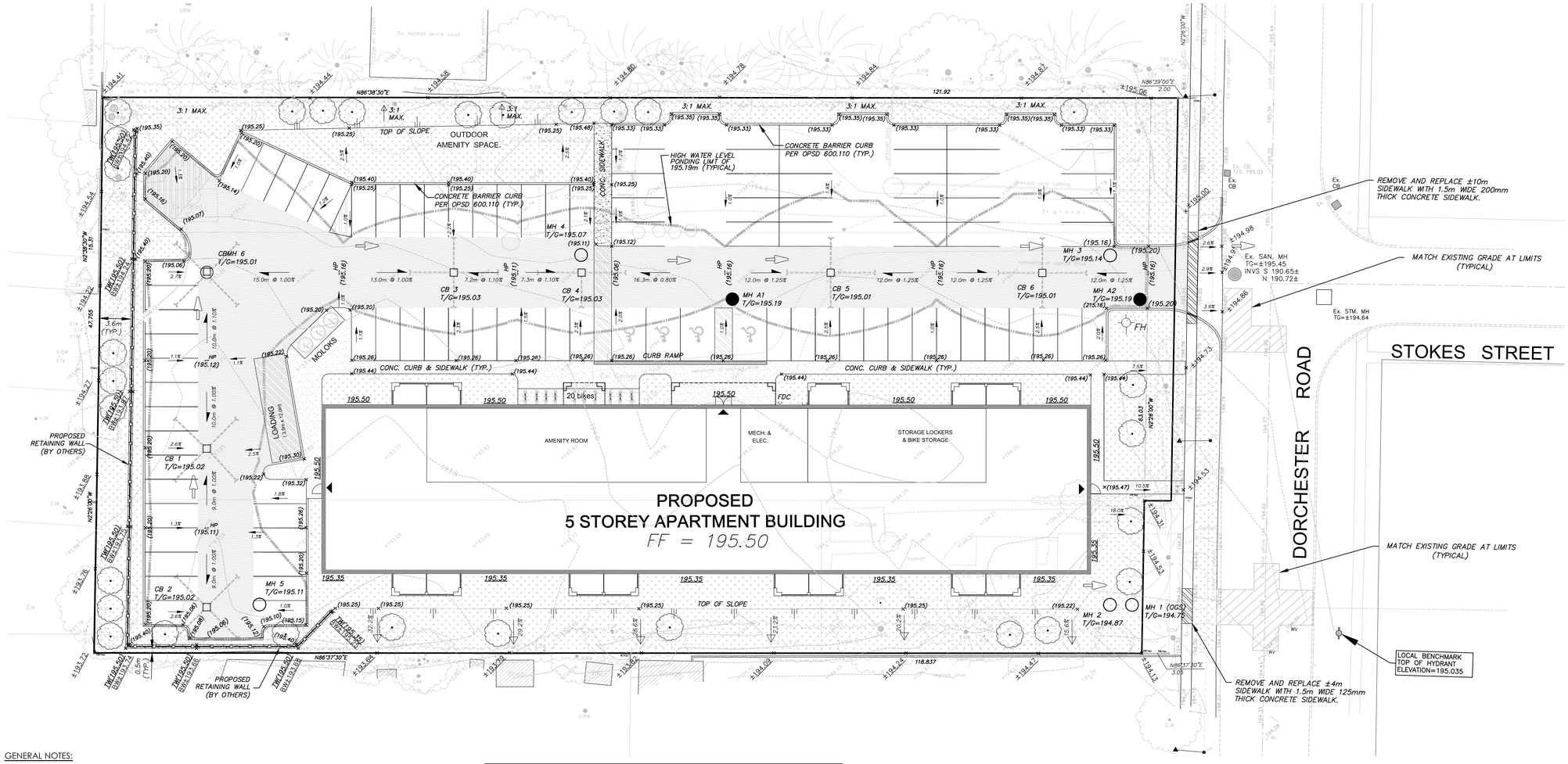
A.J. Clarke and Associates Ltd.
SURVEYORS • PLANNERS • ENGINEERS
25 MAIN STREET WEST, SUITE 300
HAMILTON, ONTARIO L8P 1H1
Tel: 905 528-8761 Fax: 905 528-2289
email: ajc@ajclarke.com

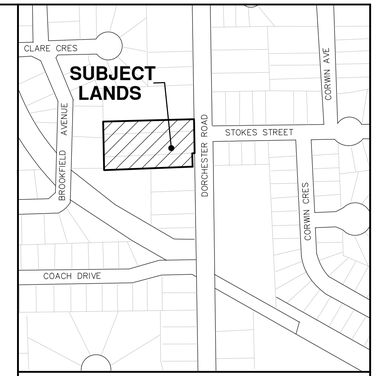
TITLE:
SERVICING PLAN

SCALE: 1: 250	DATE: JULY, 2021
DESIGN: M.D./M.M.	DRAWN: S.S./M.M.
DWG: 201239	SHT: 1

6259 & 6293 DORCHESTER ROAD

6259 & 6293 DORCHESTER ROAD





KEY PLAN N.T.S.

BENCH MARK

Elevation: 195.035

Description: Top of existing Fire Hydrant, located east of Dorchester Road adjacent to the south east corner of 2659 Dorchester Road.

Note

Topographic information was received from J.B.Barnes Limited dating May 26, 2021.

No.	Revision	By	Date
2	SECOND SUBMISSION	M.D.	NOV. 18, 2022
1.	FIRST SUBMISSION	M.D.	NOV. 03, 2021

REVISIONS

GENERAL NOTES

1. TENDERERS SHALL SATISFY THEMSELVES AS TO THE NATURE OF THE GROUND AND BID ACCORDINGLY.
2. ALL ROCK LINE INDICATIONS SHOWN ON THE PLAN MUST BE VERIFIED BY THE CONTRACTOR.
3. CONTRACTOR SHALL VERIFY LOCATIONS AND INVERTS OF ALL EXISTING SANITARY AND STORM SEWERS AND WATERMAINS, PRIVATE SEWER DRAINS AND WATER SERVICES, GASMAINS, CABLE TV, HYDRO AND TELEPHONE DUCTS, ETC., AT START OF CONSTRUCTION.

N

LIC.-HBED PROFESSIONAL ENGINEER M.J. BESSUBEAULT Nov. 18, 2022 PROVINCE OF ONTARIO

ENGINEER

PROJECT OWNER:

PANORAMIC PROPERTIES INC.

NOT ISSUED FOR CONSTRUCTION

MUNICIPALITY:

CITY OF NIAGARA FALLS (STAMFORD TOWNSHIP)

PROJECT NAME:

PROPOSED
5 STOREY APARTMENT BUILDING
6259 & 6293 DORCHESTER ROAD
NIAGARA FALLS

A. J. Clarke and Associates Ltd.
SURVEYORS • PLANNERS • ENGINEERS
25 MAIN STREET WEST, SUITE 300
HAMILTON, ONTARIO L8P 1H1
Tel: 905 528-8761 Fax: 905 528-2289
email: ajc@ajclarke.com

TITLE:

GRADING PLAN

SCALE: 1:250	DATE: JULY, 2021
DESIGN: M.D./M.M.	DRAWN: S.S./M.M.
DWG: 201239	SHT: 2

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE NOTED.

LOT GRADING NOTES

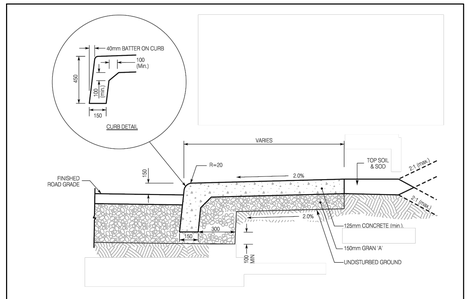
1. ALONG ADJOINING PROPERTIES GRADE TO MEET EXISTING OR PROPOSED ELEVATIONS WITH SODDED SLOPES (MAX. 3H TO 1V) AND/OR RETAINING WALLS AS SPECIFIED.
2. ALL WALLS 1.0m OR HIGHER SHALL BE DESIGNED AND SEALED BY A P.ENG.
3. RETAINING WALLS 0.6m IN HEIGHT OR GREATER REQUIRE CONSTRUCTION OF A FENCE OR GUARD RAIL AT THE TOP OF THE REAR OF THE WALL. GUARDS FOR RETAINING WALLS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF EXTERIOR GUARDS AS CONTAINED IN THE ONTARIO BUILDING CODE
4. TOP OF FOUNDATION WALLS FOR BUILDINGS SHALL BE 150mm (MIN) ABOVE FINISHED GRADE.
5. ALL FILL PLACED ON LOTS SHALL BE COMPACTED TO 100% SPD (UNLESS OTHERWISE RECOMMENDED BY THE GEOTECHNICAL ENGINEER). ALL MATERIAL SHALL BE PLACED IN LAYERS NOT EXCEEDING 300mm LIFTS.
6. LOT GRADING SHALL CONFORM STRICTLY WITH THIS PLAN. ANY CHANGES, UNLESS APPROVED PRIOR TO CONSTRUCTION BY THE CITY, SHALL RESULT IN NON ACCEPTANCE BY THE CITY.
7. IF GRADING IS REQUIRED ON LANDS ADJACENT TO THE DEVELOPMENT WHICH ARE NOT OWNED BY THE DEVELOPER, THEN THE DEVELOPER MUST OBTAIN WRITTEN PERMISSION FROM THE ADJACENT PROPERTY OWNER TO ALLOW THE DEVELOPER TO GRADE ON THE ADJACENT LANDS, OTHERWISE RETAINING WALLS MUST BE USED.
8. THE WRITTEN PERMISSION REQUIRED FROM THE ADJACENT LANDOWNER SHALL BE OBTAINED PRIOR TO ENTERING THE LANDS. SHOULD PERMISSION NOT BE OBTAINED OR IS WITHDRAWN PRIOR TO COMMENCING THE WORK, THEN THE DEVELOPER SHALL LIMIT HIS ACTIVITIES TO THE LIMITS OF THE DEVELOPMENT SITE.

ADDITIONAL NOTES FOR GRADING

1. ALL WORK INVOLVED IN THE CONSTRUCTION, RELOCATION, REPAIR OF MUNICIPAL SERVICES FOR THE PROJECT SHALL BE TO THE SATISFACTION OF THE CITY'S MANAGER OF ENGINEERING. IN ADDITION, ANY CHANGES IN GRADES AND CATCH BASINS REQUIRE THE APPROVAL OF THE CITY'S MANAGER OF ENGINEERING.
2. THE APPROVAL OF THIS PLAN DOES NOT EXEMPT THE OWNERS BONDED CONTRACTOR FROM THE REQUIREMENTS TO OBTAIN THE VARIOUS PERMITS/APPROVALS NORMALLY REQUIRED TO COMPLETE A CONSTRUCTION PROJECT, SUCH AS, BUT NOT LIMITED TO THE FOLLOWING:
   - BUILDING PERMITS
   - SEWER AND WATER PERMITS
   - ROAD CUT PERMITS
   - RELOCATION OF SERVICES
   - APPROACH APPROVAL PERMITS
   - COMMITTEE OF ADJUSTMENT
   - ENCROACHMENT AGREEMENTS (IF REQUIRED)
3. ABANDONED ACCESSES MUST BE REMOVED AND THE CURB AND BOULEVARD RESTORED WITH SOD AT THE OWNER'S EXPENSE PER SATISFACTION OF THE CITY'S ENGINEERING MANAGER.

CITY RIGHT-OF-WAY RESTORATIONS:

1. ALL DISTURBED CURBS, BOULEVARD AND UTILITIES SHALL BE RESTORED TO SUIT ORIGINAL CONDITIONS OR BETTER.
2. THROUGH ACCESS TO BE MAINTAINED AT ALL TIMES.
3. CONTRACTOR SHALL PROVIDE DETOUR SIGNS AS REQUESTED BY CITY OF NIAGARA FALLS AS REQUIRED.
4. ALL WORKS SHALL BE TO THE SATISFACTION OF THE CITY OF NIAGARA FALLS.



COMBINED CONCRETE WALK AND CURB
N.T.S.

NOTE:

FOR MORE DETAILS ON EXISTING TREES TO REMAIN, TO BE REMOVED AND PROPOSED, REFER TO THE LANDSCAPE PLANS BY ADESSO DESIGN INC.

ANY WORK PROPOSED WITHIN CITY ROW REQUIRES ROAD OCCUPANCY PERMIT.

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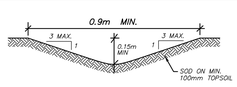
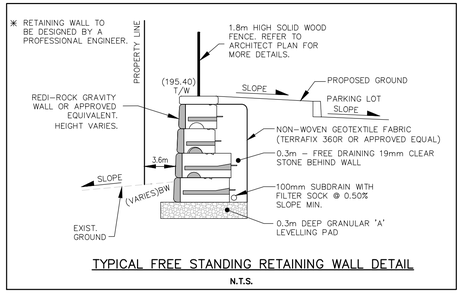
CONTRACTOR TO CLEAN EXISTING ROADWAYS OF SEDIMENTS RESULTING FROM CONSTRUCTION TRAFFIC FROM THE SITE EACH DAY.

ANY CHANGES IN GRADES AND CATCH BASINS REQURE THE APPROVAL OF THE CITY OF NIAGARA FALLS MANAGER OF ENGINEERING.

ANY AREAS WITH DIFFERENCE IN GRADE GREATER THAN 0.60m REQUIRE FALL PROTECTION AS PER OBC REQUIREMENTS.



TYPICAL SWALE SECTION
N.T.S.



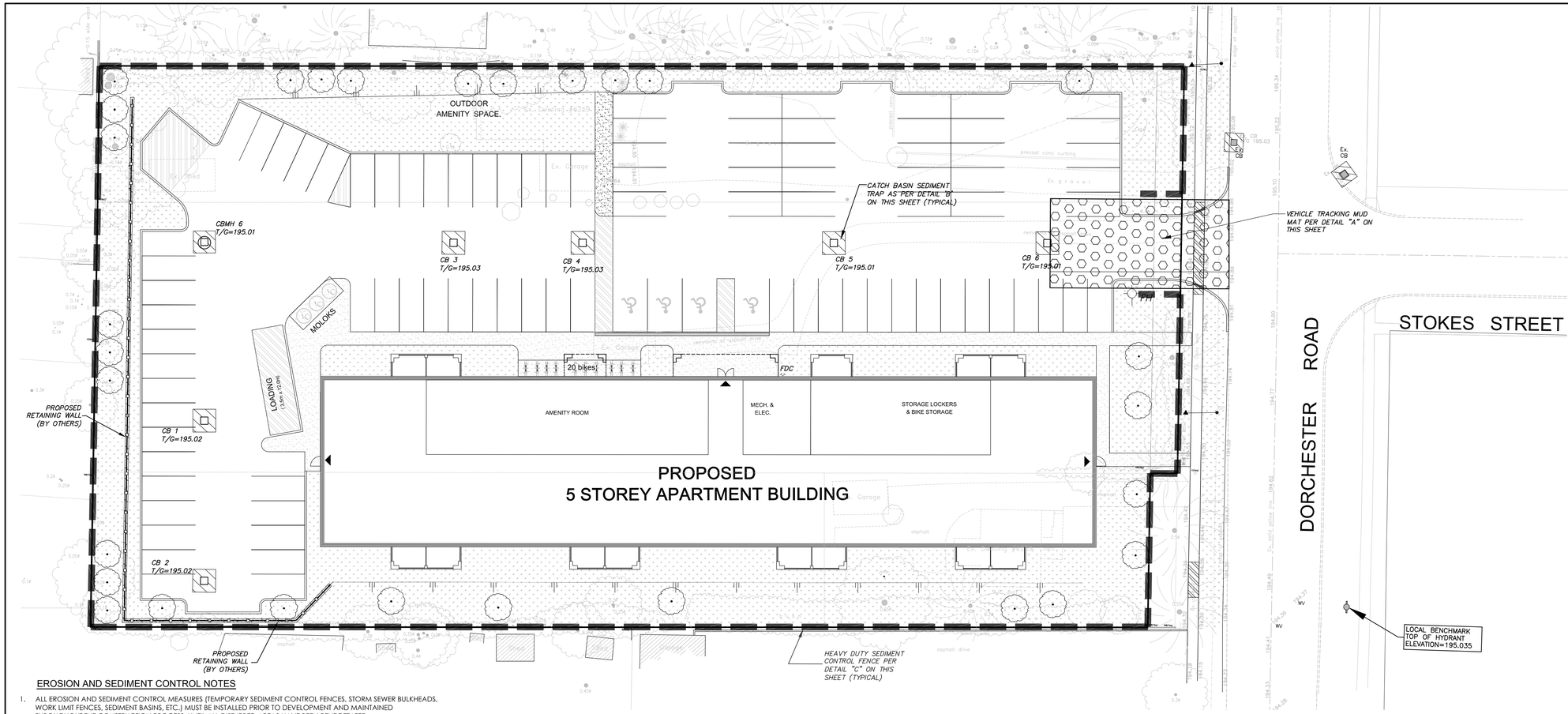
TYPICAL FREE STANDING RETAINING WALL DETAIL
N.T.S.

LEGEND

	PROPOSED DEPRESSED CURD
HP	EXISTING HYDRO POLE
HPLS	EXISTING HYDRO POLE & LIGHT STANDARD
LS	EXISTING LIGHT STANDARD
GW	EXISTING GUYWIRE
±000.00	MATCH TO EXISTING GROUND ELEVATIONS
x 000.00	EXISTING GROUND ELEVATION
(000.00)	PROPOSED GROUND ELEVATION
000.00	PROPOSED MIN. FINISHED GRADE AT DWELLING
	PROPOSED RETAINING WALL
	DIRECTION OF MAJOR OVERLAND ROUTE
	PROP. BUILDING ENVELOPE
Hyd.	EXISTING HYDRANT
CB	EXISTING CATCH BASIN
CB	PROPOSED CATCH BASIN
	PROPOSED CATCH BASIN MANHOLE
	PROPOSED STORM MANHOLE
	EXISTING STORM WATER CULVERT
	EXISTING DITCH OR SWALE
If 3:1 MAX.	PROPOSED 3:1 MAXIMUM SLOPE
	PROPOSED CURB (OPSD 600.110)
	PROPOSED DEPRESSED CURB
	PROPOSED 1.5m SIDEWALK (OPSD 310.010)
	FUTURE CURB & GUTTER
	EXISTING CURB & GUTTER
	EXISTING FENCE
	EXISTING OVERHEAD CABLES
	PROPOSED TREES
	EXISTING CONIFEROUS TREE
	EXISTING DECIDUOUS TREE

6259 & 6293 DORCHESTER ROAD
H:\Jobs\2000 Projects\201239 (Dorchester, Niagara Falls)\Engineering\Design\Current\BASEPLAN.dwg 11/18/2022 11:59 AM THE LAM

6259 & 6293 DORCHESTER ROAD



EROSION AND SEDIMENT CONTROL NOTES

1. ALL EROSION AND SEDIMENT CONTROL MEASURES (TEMPORARY SEDIMENT CONTROL FENCES, STORM SEWER BULKHEADS, WORK LIMIT FENCES, SEDIMENT BASINS, ETC.) MUST BE INSTALLED PRIOR TO DEVELOPMENT AND MAINTAINED THROUGHOUT THE CONSTRUCTION PROCESS, UNTIL ALL DISTURBED AREAS HAVE BEEN REVEGETATED.
2. TEMPORARY VEHICLE TRACKING CONTROLS TO BE CONSTRUCTED AT ALL ACCESS POINTS. CONTRACTOR SHALL MAINTAIN THESE AS REQUIRED AND AS DIRECTED BY THE CITY ENGINEER.
3. SEDIMENT CONTROL FENCES SHALL BE AS PER OPSD 219.130.
4. CUT-OFF SWALES TO BE CONSTRUCTED WHERE SPECIFIED AND PERIODICALLY INSPECTED TO ENSURE THAT EROSION DOES NOT OCCUR.
5. CATCH BASIN SEDIMENT CONTROL DEVICE, I.E. 'SILTSACK' BY ACF ENVIRONMENTAL OR APPROVED EQUIVALENT, TO BE PLACED AS PER MANUFACTURER'S RECOMMENDATIONS (SEE DETAIL 'B'). REGULAR MAINTENANCE IS REQUIRED ('SILTSACK' SUMPS SHALL BE INSPECTED FOR SEDIMENT ACCUMULATION AND FILTER CLOTH BLOCKAGE ON A WEEKLY BASIS). THESE SEDIMENT TRAPS ARE NOT TO BE REMOVED UNTIL THE CURBS HAVE BEEN CONSTRUCTED AND THE BOULEVARDS SODDED. SEDIMENT TRAPS SHALL ALSO BE PLACED AT ALL REAR YARD CATCH BASINS AND MAINTAINED UNTIL GROUND COVER IS ESTABLISHED.
6. REGULAR MAINTENANCE FOR ALL CATCH BASINS (STREET & REAR LOT) IS REQUIRED (SEDIMENT TRAPS AND SUMPS SHALL BE INSPECTED FOR SEDIMENT ACCUMULATION, TRASH BUILD-UP AND FILTER CLOTH BLOCKAGE ON A WEEKLY BASIS AND AFTER ANY MAJOR RAINFALL EVENT). ACCUMULATED SEDIMENT SHALL BE REMOVED BY MECHANICAL MEANS. FLUSHING OF SEDIMENT INTO THE STORM SEWER SYSTEM IS PROHIBITED. IF STANDING WATER REMAINS IN THE CATCH BASIN 24 HOURS (MINIMUM) AFTER A STORM THEN CLEANING OR REPLACEMENT OF THE FILTER CLOTH IS REQUIRED.
7. TOPSOIL PILES SHALL ALSO BE TEMPORARILY SEEDED TO PREVENT EROSION. PLACEMENT OF VEGETATION SHALL BE IN ACCORDANCE WITH OPSS.803. WHERE REQUIRED, EROSION CONTROL BLANKETS SHALL BE PLACED AS PER OPSS.803, AT THE DIRECTION OF THE CITY ENGINEER.
8. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE VISUALLY INSPECTED AFTER EACH WORKING DAY AND MAINTAINED WHEN REQUIRED AS DIRECTED BY THE CONSULTANT AND TO THE SATISFACTION OF THE CITY OF NIAGARA FALLS. THE CONSULTANT SHALL KEEP A DAILY RECORD OF INSPECTION, MAINTENANCE, ETC. AND PRESENT THE CITY WITH A COPY OF THE REPORT ON A MONTHLY BASIS.
9. ANY DISTURBED SUBDIVISION AREAS NOT SCHEDULED FOR FURTHER CONSTRUCTION WITHIN 45 DAYS WILL BE PROVIDED WITH A SUITABLE TEMPORARY MULCH AND SEED COVER WITHIN 7 DAYS OF THE COMPLETION OF THAT PARTICULAR PHASE OF CONSTRUCTION.
10. ALL DISTURBED EXTERNAL AREAS SHALL BE RE-VEGETATED WITH PERMANENT COVER (AS DETAILED) WITHIN 7 DAYS OF THE COMPLETION OF THAT PARTICULAR PHASE OF CONSTRUCTION.
11. ADDITIONAL EROSION AND SEDIMENT CONTROL LOCATIONS/MEASURES MAY BE REQUIRED AS DETERMINED BY THE CITY OF NIAGARA FALLS/ NPCA..

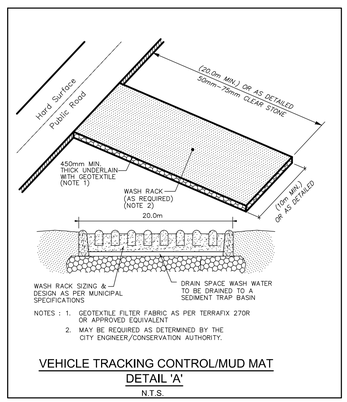
SEDIMENT BASINS/TRAPS MAINTENANCE SCHEDULE

1. SEDIMENT BASINS/TRAPS ARE TO BE INSPECTED AFTER EVERY RAINFALL AND MAINTAINED AS DIRECTED BY THE CONSULTANT AND TO THE SATISFACTION OF THE CITY ENGINEER/ CONSERVATION AUTHORITY.
2. ANY SIGNS OF VISIBLE DAMAGE TO THE TRAP/BASIN OUTLET SHALL BE REPAIRED IMMEDIATELY. IF PORTIONS OF THE DAM HAVE BEEN ERODED, I.E. OVERFLOW SECTION, THEN REPLACEMENT OF STONE AND RESHAPING OF THE DAM PROFILE SHALL BE CARRIED OUT. LIKEWISE, AT THE SEDIMENT BASIN INLETS, THE ROCK LINING SHALL BE INSPECTED AND REPAIRS PERFORMED IMMEDIATELY.
3. TRASH AND DEBRIS SHALL BE REMOVED FROM WITHIN THE TRAP/BASIN AREAS AND INLET CHAMBER (WHERE PRESENT).
4. THE SEDIMENT BASIN/TRAP SIDES AND DITCH SIDE SLOPES SHALL BE INSPECTED TO ENSURE THAT THEY HAVE NOT ERODED OR SETTLED. REMEDIAL ACTION SHALL BE TAKEN IMMEDIATELY TO RESHAPE AND STABILIZE THE SLOPES.
5. WHEN SEDIMENT ACCUMULATES TO HALF THE HEIGHT OF THE SEDIMENT BASIN/TRAP DESIGN DEPTH, I.E. 0.5/0.25 METRE RESPECTIVELY, THEN SEDIMENT REMOVAL IS REQUIRED. CARE MUST BE TAKEN TO AVOID DAMAGING THE OUTLET AND INLET DURING THIS MAINTENANCE OPERATION. DISPOSAL OF THE SEDIMENT SHALL BE TO A CONTROLLED AREA AND STABILIZED (VEGETATED).
6. IF STANDING WATER REMAINS IN THE SEDIMENT BASIN/TRAP 24 HOURS (MINIMUM) AFTER A STORM IT COULD INDICATE A BLOCKAGE IN THE ROCK CHECK DAM. VISUALLY INSPECT THE GRAVEL LINING FOR SIGNS OF EXCESSIVE SEDIMENT AND/OR TRASH BUILDUP. IF SURFACE SEDIMENT AND TRASH REMOVAL DOES NOT ALLEVIATE THE PROBLEM THEN REPLACEMENT OF THE GRANULAR MATERIAL WILL BE REQUIRED.
7. ALL WORKS PERFORMED SHALL BE TO THE SATISFACTION OF THE CITY ENGINEER / CONSERVATION AUTHORITY.

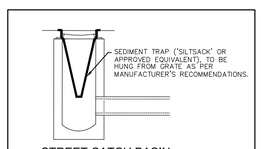
NOTE

VEHICLE TRACKING CONTROL TO BE PLACED AT DESIGNATED CONSTRUCTION ACCESS POINT / POINTS. ACTUAL LOCATION TO BE DETERMINED IN THE FIELD AND SEND TO CITY OF NIAGARA FOR APPROVAL PRIOR TO CONSTRUCTION.

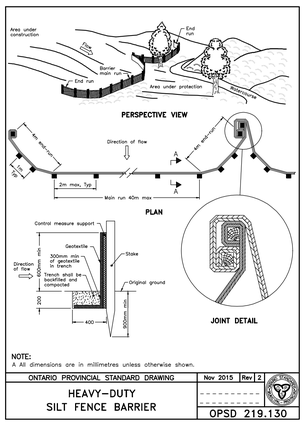
CONTRACTOR TO CLEAN EXISTING ROADWAYS OF SEDIMENTS RESULTING FROM CONSTRUCTION TRAFFIC FROM THE SITE EACH DAY.



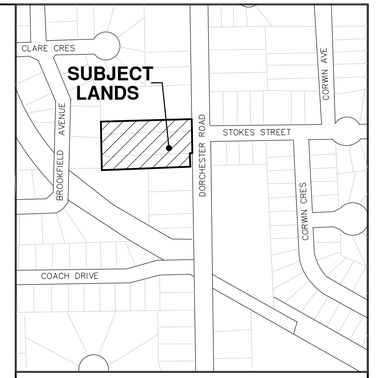
VEHICLE TRACKING CONTROL/MUD MAT
DETAIL 'A'
N.T.S.



STREET CATCH BASIN
SEDIMENT TRAP
DETAIL 'B'
N.T.S.



SEDIMENT CONTROL FENCE INSTALLATION
DETAIL 'C'
N.T.S.



KEY PLAN N.T.S.

BENCH MARK

Elevation: 195.035

Description: Top of existing Fire Hydrant, located east of Dorchester Road adjacent to the south east corner of 2659 Dorchester Road.

Note

Topographic information was received from J.B.Barnes Limited dating May 26, 2021.

No.	Revision	By	Date
2	SECOND SUBMISSION	M.D.	NOV. 18, 2022
1.	FIRST SUBMISSION	M.D.	NOV. 03, 2021

REVISIONS

GENERAL NOTES

1 TENDERERS SHALL SATISFY THEMSELVES AS TO THE NATURE OF THE GROUND AND BID ACCORDINGLY.

2 ALL ROCK LINE INDICATIONS SHOWN ON THE PLAN MUST BE VERIFIED BY THE CONTRACTOR.

3 CONTRACTOR SHALL VERIFY LOCATIONS AND INVERTS OF ALL EXISTING SANITARY AND STORM SEWERS AND WATERMAINS, PRIVATE SEWER DRAINS AND WATER SERVICES, GASMAINS, CABLE TV, HYDRO AND TELEPHONE DUCTS, ETC., AT START OF CONSTRUCTION.

LEGEND:

VEHICLE TRACKING CONTROL / MUD MAT (DETAIL 'A')

STREET CATCH BASIN SEDIMENT TRAP (DETAIL 'B')

SEDIMENT CONTROL FENCE (DETAIL `C') (OPSD 219.130)

LIC. PROFESSIONAL ENGINEER
M.J. DESSUREAULT
Nov. 18, 2022
PROVINCE OF ONTARIO

ENGINEER

PROJECT OWNER:

PANORAMIC PROPERTIES INC.

NOT ISSUED FOR CONSTRUCTION

MUNICIPALITY:

CITY OF NIAGARA FALLS
(STAMFORD TOWNSHIP)

PROJECT NAME:

PROPOSED
5 STOREY APARTMENT BUILDING
6259 & 6293 DORCHESTER ROAD
NIAGARA FALLS

A. J. Clarke and Associates Ltd.
SURVEYORS • PLANNERS • ENGINEERS
25 MAIN STREET WEST, SUITE 300
HAMILTON, ONTARIO L8P 1H1
Tel: 905 528-8761 Fax: 905 528-2289
email: ajc@ajclarke.com

TITLE:

EROSION AND SEDIMENT CONTROL PLAN

SCALE: 1: 250	DATE: JULY, 2021
DESIGN: M.D./M.M.	DRAWN: S.S./M.M.
DWG: 201239	SHT: 3

6259 & 6293 DORCHESTER ROAD
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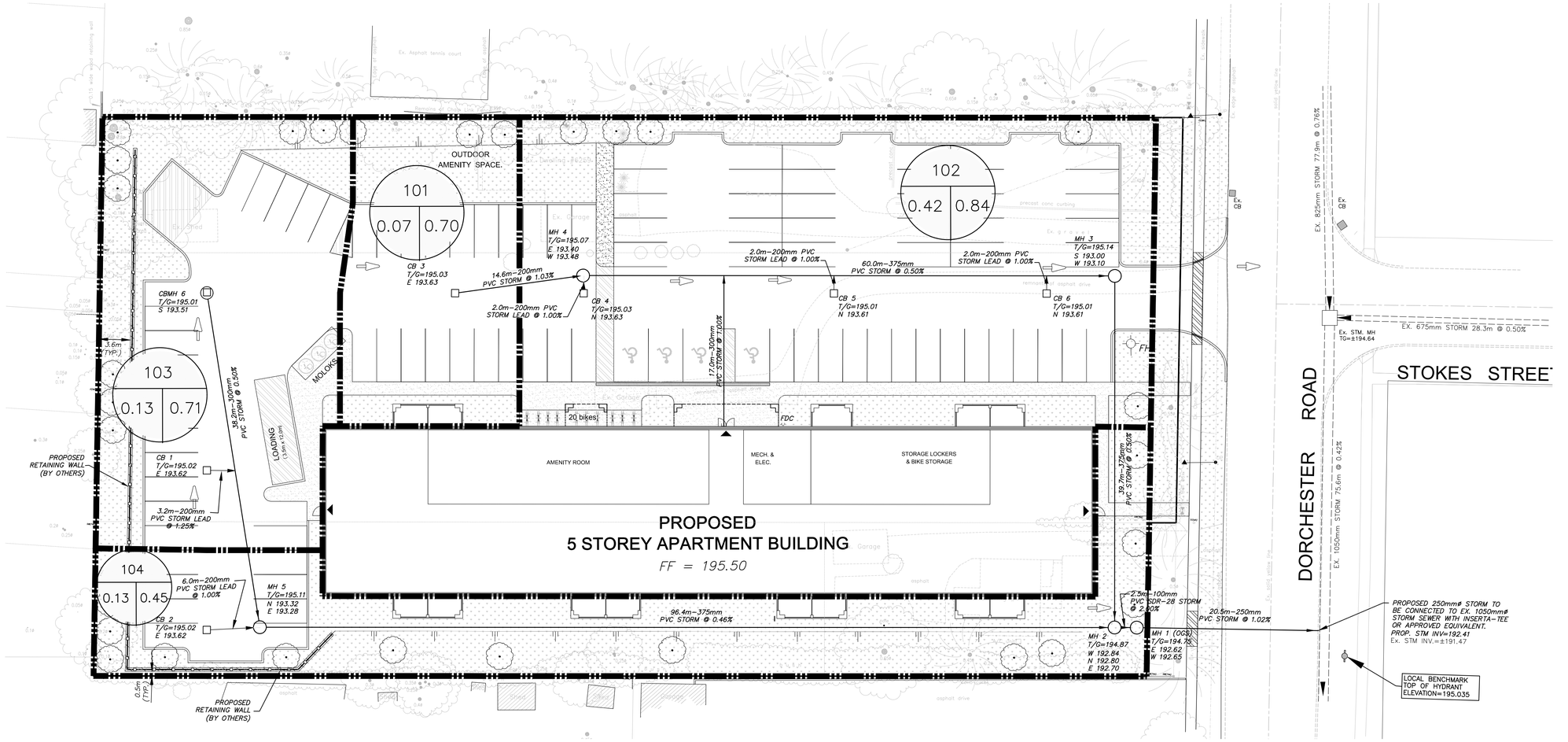
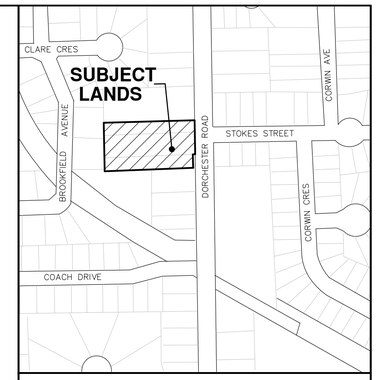
6259 & 6293 DORCHESTER ROAD





KEY PLAN N.T.S.

BENCH MARK

Elevation: 195.035

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Note

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No.	Revision	By	Date
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LICENCED PROFESSIONAL ENGINEER M.J. DESSUREAULT Nov. 18, 2022 PROVINCE OF ONTARIO

ENGINEER

PROJECT OWNER:

PANORAMIC PROPERTIES INC.

NOT ISSUED FOR CONSTRUCTION

MUNICIPALITY:

CITY OF NIAGARA FALLS (STAMFORD TOWNSHIP)

PROJECT NAME:

PROPOSED 5 STOREY APARTMENT BUILDING
6259 & 6293 DORCHESTER ROAD
NIAGARA FALLS

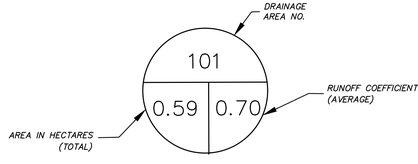
A. J. Clarke and Associates Ltd.
SURVEYORS • PLANNERS • ENGINEERS
25 MAIN STREET WEST, SUITE 300
HAMILTON, ONTARIO L8P 1H1
Tel: 905 528-8761 Fax: 905 528-2289
email: ajc@ajclarke.com

TITLE:

STORM DRAINAGE AREA PLAN

SCALE: 1:250	DATE: JULY, 2021
DESIGN: M.D./M.M.	DRAWN: S.S./M.M.
DWG: 201239	SHT: 4

LEGEND



DIRECTION OF MAJOR OVERLAND ROUTE

DRAINAGE AREA BOUNDARY

6259 & 6293 DORCHESTER ROAD

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APPENDIX B:

Storm Sewer Design Calculations (5-year)

Storm Sewer Design Calculations (100-year)

C-Values

Estimated Sanitary and Water Demand

Calculated Required Fire Flow (RFF)

Hydrant Flow Test Report

Rated Theoretical Capacity of Fire Hydrant

CITY OF NIAGARA FALLS

STORM SEWER DESIGN CALCULATIONS (5-YEAR)
DORCHESTER ROAD APARTMENT DEVELOPMENT

A.J. Clarke and Associates Ltd.

Job No.: 201239

Date: November 2022

Designed by: M Dessureault

DESIGN INFORMATION

Design Storm Parameters		Pipe Roughness
Tc = 10 mins	A = 720	n = 0.013
$i = A / (B + T_C)^C$	B = 6.34	min. v = 0.80 m/sec
	C = 0.7687	max. v = 6.00 m/sec

Drainage Area	STRUCTURE LOCATION		DRAINAGE AREA				RUNOFF			PROPOSED STORM SEWER DESIGN							REMARKS
	From	To	A	C	AC	Cumul. AC	Cumul. T_C	i	Q	Dia.	Pipe Slope	Actual Capacity (full)	Velocity (full)	Pipe Length	Time of Flow	% Full	
			ha					mm/hr	m^3/s	mm	%	m^3/s	m/s	m	min.		
1	CB 3	MH 4	0.07	0.70	0.049	0.049	10.00	84.02	0.011	200	1.03	0.035	1.07	14.6	0.23	33.0	NO SURCHARGE
2	MH 4	MH 3	0.42	0.84	0.353	0.402	10.23	83.14	0.093	375	0.50	0.129	1.13	60.0	0.88	71.7	NO SURCHARGE
	MH 3	MH 2	0.00	0.00	0.000	0.402	11.11	79.89	0.089	375	0.50	0.129	1.13	39.7	0.58	68.9	NO SURCHARGE
3	CBMH 6	MH 5	0.13	0.71	0.092	0.092	10.00	84.02	0.022	300	0.50	0.071	0.98	38.2	0.65	30.1	NO SURCHARGE
4	MH 5	MH 2	0.13	0.45	0.059	0.151	10.65	81.54	0.034	375	0.46	0.124	1.09	96.4	1.48	27.5	NO SURCHARGE
	MH 2	MH 1 (OGS)	0.00	0.00	0.000	0.553	12.13	76.48	0.053	100	2.00	0.008	0.94	2.5	0.04	693.3	SURCHARGE
	MH 1 (OGS)	Ex. STM	0.00	0.00	0.000	0.553	12.17	76.34	**0.053**	250	1.02	0.063	1.24	20.5	0.28	84.9	NO SURCHARGE
	CB 1	CBMH6 - MH5	0.05	0.78	0.039	0.039	10.00	84.02	0.009	200	1.25	0.038	1.18	3.2	0.05	23.9	NO SURCHARGE
	CB 2	MH 5	0.04	0.69	0.028	0.028	10.00	84.02	0.006	200	1.00	0.034	1.05	6.0	0.09	18.9	NO SURCHARGE
	CB 4	MH 4	0.08	0.80	0.064	0.064	10.00	84.02	0.015	200	1.00	0.034	1.05	2.0	0.03	43.8	NO SURCHARGE
	CB 5	MH 4 - MH 3	0.08	0.82	0.066	0.066	10.00	84.02	0.015	200	1.00	0.034	1.05	2.0	0.03	44.9	NO SURCHARGE
	CB 6	MH 4 - MH 3	0.08	0.78	0.062	0.062	10.00	84.02	0.015	200	1.00	0.034	1.05	2.0	0.03	42.7	NO SURCHARGE

An orifice tube with orifice control will be constructed between MH 2 and MH 1 (OGS). The maximum flow will be restricted to 53 L/sec based on orifice tube control.

CITY OF NIAGARA FALLS

STORM SEWER DESIGN CALCULATIONS (100-YEAR)
DORCHESTER ROAD APARTMENT DEVELOPMENT

A.J. Clarke and Associates Ltd.

Job No.: 201239

Date: November 2022

Designed by: M Dessureault

DESIGN INFORMATION

Design Storm Parameters		Pipe Roughness
Tc = 10 mins	A = 1264.57	n = 0.013
$i = A / (B + T_C)^C$	B = 7.72	min. v = 0.80 m/sec
	C = 0.7814	max. v = 6.00 m/sec

Drainage Area	STRUCTURE LOCATION		DRAINAGE AREA				RUNOFF			PROPOSED STORM SEWER DESIGN							REMARKS
	From	To	A	C	AC	Cumul. AC	Cumul. T_C	i	Q	Dia.	Pipe Slope	Actual Capacity (full)	Velocity (full)	Pipe Length	Time of Flow	% Full	
			ha					mm/hr	m^3/s	mm	%	m^3/s	m/s	m	min.		
1	CB 3	MH 4	0.07	0.70	0.049	0.049	10.00	133.78	0.018	200	1.03	0.035	1.07	14.6	0.23	52.6	NO SURCHARGE
2	MH 4	MH 3	0.42	0.84	0.353	0.402	10.23	132.45	0.148	375	0.50	0.129	1.13	60.0	0.88	114.3	SURCHARGE
	MH 3	MH 2	0.00	0.00	0.000	0.402	11.11	127.58	0.142	375	0.50	0.129	1.13	39.7	0.58	110.1	SURCHARGE
3	CBMH 6	MH 5	0.13	0.71	0.092	0.092	10.00	133.78	0.034	300	0.50	0.071	0.98	38.2	0.65	48.0	NO SURCHARGE
4	MH 5	MH 2	0.13	0.45	0.059	0.151	10.65	130.06	0.054	375	0.46	0.124	1.09	96.4	1.48	43.9	NO SURCHARGE
	MH 2	MH 1 (OGS)	0.00	0.00	0.000	0.553	12.13	122.44	0.053	100	2.00	0.008	0.94	2.5	0.04	693.2	SURCHARGE
	MH 1 (OGS)	Ex. STM	0.00	0.00	0.000	0.553	12.17	122.23	**0.053**	250	1.02	0.063	1.24	20.5	0.28	84.9	NO SURCHARGE
	CB 1	CBMH6 - MH5	0.05	0.78	0.039	0.039	10.00	133.78	0.014	200	1.25	0.038	1.18	3.2	0.05	38.0	NO SURCHARGE
	CB 2	MH 5	0.04	0.69	0.028	0.028	10.00	133.78	0.010	200	1.00	0.034	1.05	6.0	0.09	30.1	NO SURCHARGE
	CB 4	MH 4	0.08	0.80	0.064	0.064	10.00	133.78	0.024	200	1.00	0.034	1.05	2.0	0.03	69.7	NO SURCHARGE
	CB 5	MH 4 - MH 3	0.08	0.82	0.066	0.066	10.00	133.78	0.024	200	1.00	0.034	1.05	2.0	0.03	71.4	NO SURCHARGE
	CB 6	MH 4 - MH 3	0.08	0.78	0.062	0.062	10.00	133.78	0.023	200	1.00	0.034	1.05	2.0	0.03	67.9	NO SURCHARGE

C-VALUES

Project: Dorchester Road, Niagara Falls
Job No.: 201239
Date: November 2022
Designed by: M Dessureault

Impervious Surface - Pvmt/Bldg	0.90
Pervious Surface - Grass/Sod	0.30

DRAINAGE AREA	AREA m^2	AREA ha	IMP m^2	GRASS m^2	C-VAL	
1	685	0.07	452	233	0.70	
2	4166	0.42	3721	445	0.84	
3	1322	0.13	908	414	0.71	
4	1320	0.13	336	984	0.45	
FOR CB 1	486	0.05	391	95	0.78	
FOR CB 2	367	0.04	238	129	0.69	
FOR CB 4	819	0.08	687	132	0.80	
FOR CB 5	837	0.08	722	115	0.82	
FOR CB 6	839	0.08	665	174	0.78	% IMP
	7493	0.75	5417	2076	0.73	0.72

Estimated Sanitary and Water Demand

Project Name: 6259 & 6293 Dorchester, Niagara Falls
Project Number: 201239
Date: November 2022
Prepared by: M Dessureault

Sanitary Demand

Site Area + 1/2 R.O.W. = 0.749 + 0.088 = 0.837 ha

Design Flow = Average Dry Weather Flow x Peak Factor + Infiltration Allowance

Sanitary sewers shall be designed for **450** Litres / day / capita

For Population of site

Low Rise Apartment use

Number of Units = 74 18 - 1 bedroom units
56 - 2 bedroom units

Per OBC Section 3.1.17.1. Occupant Load Determination

2 persons per sleeping room

For number of people

18	1-bedrooms x 2 people	=	36	people	
56	2-bedrooms x 4 people	=	224	people	
		Total =	260	people	= 311 ppha

Average Dry Weather Flow

Flow = 450 Litres / day / per person

Flow = 260 people x 450 L/d/ca = 117,000 Litres / day
= 1.354 Litres / sec

Sanitary Peak Factor (M): where 2<M<5

$M = 5 / P^{0.2}$ where P is in thousands

$M = 5 / (260/1000)^{0.2}$ = 6.55 use 5.0

Infiltration Allowance

Use 0.286 Litres / sec / ha

= 0.286 L/s/ha x 0.837 ha = 0.239 Litres / sec

San. Design Flow = 1.354 x 5 + 0.239 = **7.01** **Litres / sec**

Water Usage

Based on sanitary demand = 117,000 Litres / day
= **1.354 Litres / sec**

Max. Daily Peaking Factor (Per MECP Table 3-1) = 2.75

Max. Hourly Peaking Factor (Per Harmon) = 4.10

Max. Daily Demand = 1.354 L/sec x 2.75 = **3.72** **L/sec**

Max. Hourly Demand = 1.354 L/sec x 4.08 = 5.56 L/sec

CALCULATED REQUIRED FIRE FLOW (RFF)

Project Name: 6259 & 6293 Dorchester Road, Niagara Falls
Project Number: 201239
Date: November 2022
Prepared by: M. Dessureault

GUIDE FOR DETERMINATION OF REQUIRED FIRE FLOW

$Q = K\ V\ S_{tot}$ Supply of water available for firefighting purposes (per OBC Div B: A-3.2.5.7)

Q = minimum supply of water in liters
K = water supply coefficient from Table 1
V = total building volume in cubic metres
S_{tot} = total of spatial coefficient values from property line exposures on all sides as obtained from the formula:

$S_{tot} = 1.0 + (S_{side1} + S_{side2} + S_{side3} + \ldots \text{ etc.})$

where, S_{side} = values established from Figure 1, as modified by Items 3(d) and 3(f) ,and

S_{tot} = need not exceed 2.0

OUTLINE OF PROCEDURE

Determine K (from Table 1 per OBC Div B: A-3.2.5.7):

Classify Buildings (per OBC 3.1.2.1)

Description of major occupancy =	Residential occupancies
Division =	N/A
Group =	C

From Table 1

Type of Construction =	Building is of noncombustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2., including loadbearing walls, columns and arches.

K = 10

Determine V:

	Building Area (A) =	1,835.0 m²
	Building Height (H) =	16.0 m
V =	Building Volume (AxH) =	29,360 m³

Determine S_{tot}:

Distance from Property Line to Building		Spatial Coefficient (Figure 1)	
North =	35 m	0	to property line
East =	20 m	0	to road centerline
South =	9 m	0.1	to property line
West =	25.50 m	0	to property line
		Total = 0.10	

S_{tot} = 1.0 + Total Make sure ≤ 2.0

S_{tot} = 1.1

$Q = K\ V\ S_{tot}$ = K x V x S = 322960 L

From Table 2 (OBC A-3.2.5.7) 9 000 (if Q > 270 000 L)

Required Minimum Water Flow Rate = 9000 L/min **= 150 L/sec** **Calculated RFF**

Table 3.1.2.1.
Major Occupancy Classification
Forming Part of Sentences 3.1.2.1.(1), 3.1.2.2.(1) and 3.11.2.1.(3)

Group	Division	Description of *Major Occupancies*
A	1	*Assembly occupancies* intended for the production and viewing of the performing arts
A	2	*Assembly occupancies* not elsewhere classified in Group A
A	3	*Assembly occupancies* of the arena type
A	4	*Assembly occupancies* in which occupants are gathered in the open air
B	1	*Detention occupancies*
B	2	*Care and treatment occupancies*
B	3	*Care occupancies*
C	---	*Residential occupancies*
D	---	*Business and personal services occupancies*
E	---	*Mercantile occupancies*
F	1	*High hazard industrial occupancies*
F	2	*Medium hazard industrial occupancies*
F	3	*Low hazard industrial occupancies*
Column 1	2	3

Table 1

Water Supply Coefficient - K

Type of Construction	Classification by Group or Division in Accordance with Table 3.1.2.1. of the Building Code				
	A-2 B-1 B-2 B-3 C D	A-4 F-3	A-1 A-3	E F-2	F-1
Building is of noncombustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2., including loadbearing walls, columns and arches.	10	12	14	17	23
Building is of noncombustible construction or of heavy timber construction conforming to Article 3.1.4.6. Floor assemblies are fire separations but with no fire-resistance rating. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire-resistance rating.	16	19	22	27	37
Building is of combustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2., including loadbearing walls, columns and arches. Noncombustible construction may be used in lieu of fire-resistance rating where permitted in Subsection 3.2.2.	18	22	25	31	41
Building is of combustible construction. Floor assemblies are fire separations but with no fire-resistance rating. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire-resistance rating.	23	28	32	39	53
Column 1	2	3	4	5	6

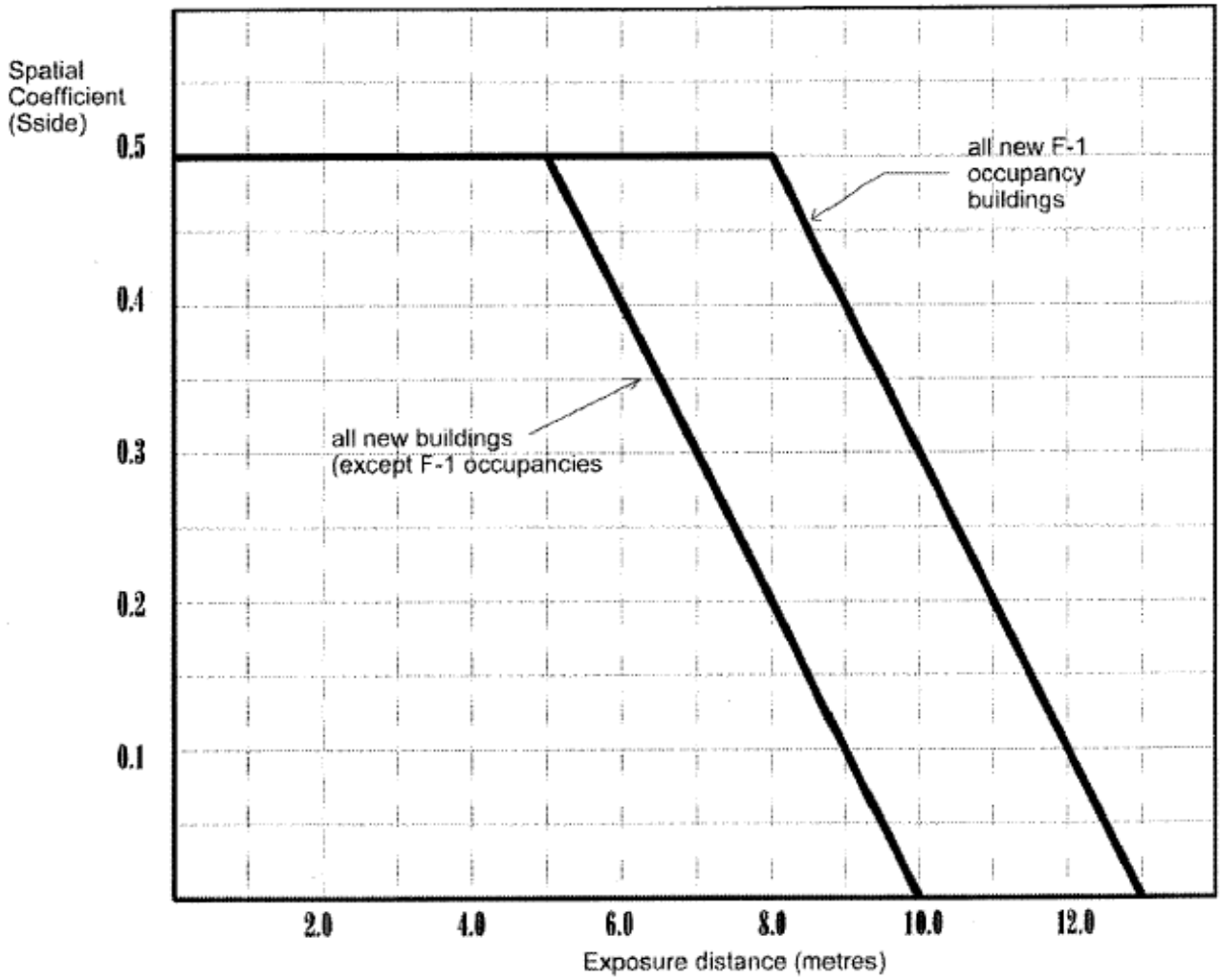


Figure 1
Spatial Coefficient vs Exposure Distance

Table 2	
Part 3 Buildings under the Building Code	Required Minimum Water Supply Flow Rate, L/min
One-storey building with building area not exceeding 600 m²	1 800
All other buildings	2 700 (if Q ≤ 108 000 L)(1) 3 600 (if Q > 108 000 L and ≤ 135 000 L)(1) 4 500 (if Q > 135 000 L and ≤ 162 000 L)(1) 5 400 (if Q > 162 000 L and ≤ 190 000 L)(1) 6 300 (if Q > 190 000 L and ≤ 270 000 L)(1) 9 000 (if Q > 270 000 L)(1)

Hydrant Flow Test Report

SITE NAME:

SITE ADDRESS / MUNICIPALITY: 6253-6293 Dorchester Road Niagara Falls, ON

TEST HYDRANT LOCATION : Front of House Number 6278 Dorchester Road { Hydrant ID 01508 }

BASE HYDRANT LOCATION: 1st Fire Hydrant North of Number 6430 Dorchester Road { Hydrant ID 01510 }

TEST BY: Luzia Wood

TEST DATE: July 08 ,2021

TEST TIME: 7:57AM

TEST DATA

FLOW HYDRANT — Pipe Diam. (in / mm): 300 C.I

	PITOT 1	PITOT 2
SIZE OPENING (inches):	2.5	2.5
COEFFICIENT (**note 1**):	0.90	0.90
PITOT READING (psi):	65	48 / 48
FLOW (usgpm):	**1353**	**2325**

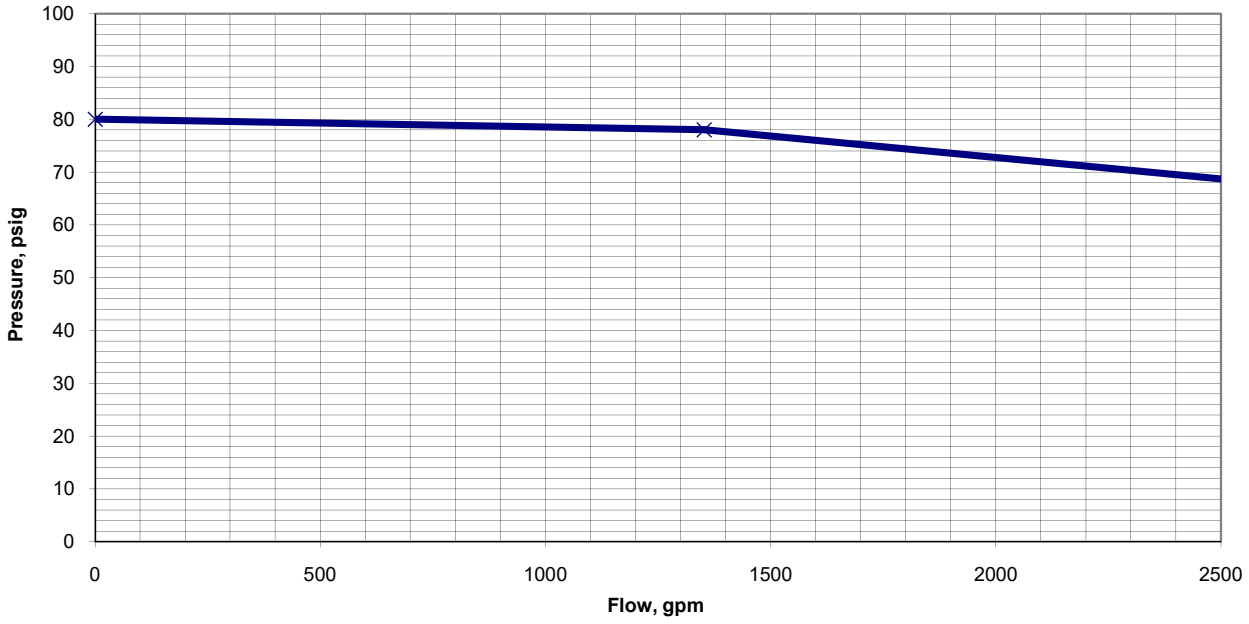
THEORETICAL FLOW @ 20 PSI 8489

BASE HYDRANT — Pipe Diam. (in / mm): 300 C.I

STATIC READING (psi): 80 RESIDUAL 1 (psi): 78 RESIDUAL 2 (psi): 74

REMARKS:

NOTE 1: Conversion factor of .90 used for flow calculation based on rounded and flush internal nozzle configuration. No appreciable difference in pipe invert between flow and base hydrants.



491 Port Maitland Rd

RATED THEORETICAL CAPACITY OF FIRE HYDRANT

Project Name: 6259 & 6293 Dorchester Road, Niagara Falls
Project Number: 201239
Date: November 2022
Prepared by: M. Dessureault

CALCULATION TO DETERMINE THE PREDICTED FLOW OF A FIRE HYDRANT PER NFPA GUIDELINES AND BASED ON THE RATED THEORETICAL CAPACITY AT 20 PSI

Hydrant Flow Test Results

Predicted Flow (PF)	=	20	(Predicted Flow is always 20 psi)
Static Pressure (SP)	=	80	(per hydrant flow test results)
Residual Pressure (RP)	=	78	(per hydrant flow test results)
Flow (USGPM)	=	1353	(Residual Flow per hydrant flow test results-Imperial Units)

Theoretical Fire Flow Calculation @ 20 psi

(1) = SP - PF	=	60	
(2) = SP - RP	=	2	
(3) = (1) / (2)	=	30.000	
(4) = (3) ^ 0.54	=	6.275	
(5) = Flow x (4)	=	8491	USGPM

USGPM to L/min Conversion

Flow (USGPM)	=	8491	FAR20
Flow (UKGPM)	=	7070	
Flow (L/sec)	=	536	

APPENDIX C:

MIDUSS Model Output Files

Site Storage Volume Calculations

5-year Pre-Development

```
"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                          Version 2.25  rev. 473"
"                MIDUSS created                     Thursday, September 12, 2013"
"           10   Units used:                                        ie METRIC"
"                Job folder:                          C:\Users\Dessurealt\Desktop"
"                Output filename:                           201239 - 5-yr Pre.out"
"                Licensee name:                                            User"
"                Company                                A J Clarke and Associates"
"                Date & Time last used:                   8/19/2021 at 3:48:12 PM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"            1   Chicago storm"
"      719.500   Coefficient A"
"        6.340   Constant B"
"        0.769   Exponent C"
"        0.500   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity            84.024    mm/hr"
"             Total depth                  38.812    mm"
"            6   005hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 101"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          101   No description"
"       29.000   % Impervious"
"        0.763   Total Area"
"       64.000   Flow length"
"        1.500   Overland Slope"
"        0.542   Pervious Area"
"       64.000   Pervious length"
"        1.500   Pervious slope"
"        0.221   Impervious Area"
"       64.000   Impervious length"
"        1.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       79.690   Pervious SCS Curve No."
"        0.299   Pervious Runoff coefficient"
"        0.077   Pervious Ia/S coefficient"
"        5.000   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.780   Impervious SCS Curve No."
"        0.886   Impervious Runoff coefficient"
"        0.319   Impervious Ia/S coefficient"
"        1.000   Impervious Initial abstraction"
"                     0.053     0.000     0.000     0.000 c.m/sec"
"             Catchment 101          Pervious   Impervious Total Area "
"             Surface Area           0.542      0.221      0.763      hectare"
"             Time of concentration  32.357     4.111      16.884     minutes"
"             Time to Centroid       151.671    103.885    125.493    minutes"
"             Rainfall depth         38.812     38.812     38.812     mm"
"             Rainfall volume        210.31     85.90      296.21     c.m"
"             Rainfall losses        27.219     4.427      20.609     mm"
"             Runoff depth           11.593     34.385     18.203     mm"
"             Runoff volume          62.82      76.10      138.92     c.m"
"             Runoff coefficient     0.299      0.886      0.469      "
"             Maximum flow           0.016      0.051      0.053      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.053     0.053     0.000     0.000"
```

5-year Post-Development to 5-year Pre-Development

```
"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                          Version 2.25  rev. 473"
"                MIDUSS created                    Thursday, September 12, 2013"
"           10   Units used:                                        ie METRIC"
"                Job folder:                       C:\Users\Dessurealt\Desktop"
"                Output filename:          201239 - 5-yr Post to 5-yr Pre.out"
"                Licensee name:                                           User"
"                Company                             A J Clarke and Associates"
"                Date & Time last used:                8/19/2021 at 3:36:23 PM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"            1   Chicago storm"
"      719.500   Coefficient A"
"        6.340   Constant B"
"        0.769   Exponent C"
"        0.500   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity            84.024    mm/hr"
"             Total depth                  38.812    mm"
"            6   005hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 102"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"          102   No description"
"       67.200   % Impervious"
"        0.763   Total Area"
"       25.000   Flow length"
"        1.500   Overland Slope"
"        0.250   Pervious Area"
"       25.000   Pervious length"
"        1.500   Pervious slope"
"        0.513   Impervious Area"
"       25.000   Impervious length"
"        1.500   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       79.690   Pervious SCS Curve No."
"        0.299   Pervious Runoff coefficient"
"        0.077   Pervious Ia/S coefficient"
"        5.000   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.780   Impervious SCS Curve No."
"        0.887   Impervious Runoff coefficient"
"        0.319   Impervious Ia/S coefficient"
"        1.000   Impervious Initial abstraction"
"                     0.120     0.000     0.000     0.000 c.m/sec"
"             Catchment 102          Pervious   Impervious Total Area "
"             Surface Area           0.250      0.513      0.763      hectare"
"             Time of concentration  18.409     2.339      4.607      minutes"
"             Time to Centroid       133.837    101.455    106.025    minutes"
"             Rainfall depth         38.812     38.812     38.812     mm"
"             Rainfall volume        97.16      199.06     296.21     c.m"
"             Rainfall losses        27.223     4.384      11.875     mm"
"             Runoff depth           11.589     34.428     26.937     mm"
"             Runoff volume          29.01      176.57     205.58     c.m"
"             Runoff coefficient     0.299      0.887      0.694      "
"             Maximum flow           0.011      0.117      0.120      c.m/sec"
```

```
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.120     0.120     0.000     0.000"
" 54          POND DESIGN"
"         0.120   Current peak flow    c.m/sec"
"         0.053   Target outflow    c.m/sec"
"         205.6   Hydrograph volume    c.m"
"           21.   Number of stages"
"       192.700   Minimum water level    metre"
"       195.160   Maximum water level    metre"
"       192.700   Starting water level    metre"
"             0   Keep Design Data: 1 = True; 0 = False"
"                   Level Discharge    Volume"
"                 192.700     0.000     0.000"
"                 192.823   0.00661    12.300"
"                 192.946   0.01179    24.600"
"                 193.069   0.01530    36.900"
"                 193.192   0.01815    49.200"
"                 193.315   0.02061    61.501"
"                 193.438   0.02280    73.801"
"                 193.561   0.02480    86.101"
"                 193.684   0.02666    98.401"
"                 193.807   0.02839   110.701"
"                 193.930   0.03002   123.000"
"                 194.053   0.03157   135.300"
"                 194.176   0.03304   147.600"
"                 194.299   0.03445   159.900"
"                 194.422   0.03581   172.200"
"                 194.545   0.03711   184.500"
"                 194.668   0.03838   196.800"
"                 194.791   0.03960   209.100"
"                 194.914   0.04078   221.400"
"                 195.037   0.04193   233.701"
"                 195.160   0.04306   246.001"
"            1.   ORIFICES"
"                 Orifice   Orifice   Orifice Number of"
"                  invert coefficie  diameter  orifices"
"                 192.700     0.800    0.1000     1.000"
"            1.   LAYERS"
"                  Bottom    Aspect    Bottom       Top   Average"
"                    area     ratio elevation elevation sideslope"
"                 100.000     4.000   192.700   195.160     0.000"
"              Peak outflow                  0.027    c.m/sec"
"              Maximum level               193.707    metre"
"              Maximum storage             100.658    c.m"
"              Centroidal lag                2.590   hours"
"                   0.120     0.120     0.027     0.000 c.m/sec"
```

SITE STORAGE VOLUME & PONDING CALCULATIONS

Project: Dorchester Road - Apartment Development
Job No.: 201239
Date: November 2022
Designed by: M Dessureault

Volume Required:

5-year Post-Development to 5-year Pre-Development = **101 m^3** from MIDUSS Modelling

Parking Lot Volumes (to ponding elevation 195.19m):

Ponding Location	Ponding Area m^2	Ponding Depth m	Volume m^3
CBMH 6	399.5	0.18	23.97
CB 1	239.9	0.17	13.59
CB 2	192.7	0.16	10.28
CB 3	240.4	0.15	12.02
CB 4	273.7	0.15	13.69
CB 5	301.5	0.17	17.09
CB 6	264.3	0.17	14.98
		Total	105.6

For Volume in Structures and Pipes:

Description	Length m	Volume m^3
200mm ø pipe	29.8	0.94
300mm ø pipe	38.2	2.70
375mm ø pipe	196.1	21.66
600x600 CB x 6 @ 1.05m depth	6.30	2.27
1200mm ø CBMH 6	0.90	1.02
1200mm ø MH 2	1.36	1.54
1200mm ø MH 3	1.37	1.55
1200mm ø MH 4	1.09	1.23
1200mm ø MH 5	1.19	1.35
	Total	**34.25**

Total volume provided = 105.6 + 34.3 = **139.9 m^3 > 101 m^3 .: OK**

APPENDIX D:

Stormceptor® EF Sizing Report

Stormceptor® EF-4 Detail

Stormceptor® EF Owner's Manual

STORMCEPTOR®
ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

08/20/2021

Province:	Ontario
City:	Niagara Falls
Nearest Rainfall Station:	ST CATHARINES AP
NCDC Rainfall Station Id:	7287
Years of Rainfall Data:	33

Site Name:	

Drainage Area (ha):	0.76
% Imperviousness:	68.00

Runoff Coefficient 'c': 0.70

Particle Size Distribution:	Fine
Target TSS Removal (%):	70.0

Project Name:	2659 Dorchester Road
Project Number:	201239
Designer Name:	Michael Dessureault
Designer Company:	Mantecon Partners Inc
Designer Email:	dessureault@manteconpartners.com
Designer Phone:	905-648-0373
EOR Name:	
EOR Company:	
EOR Email:	
EOR Phone:	

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	18.95
Oil / Fuel Spill Risk Site?	No
Upstream Flow Control?	Yes
Upstream Orifice Control Flow Rate to Stormceptor (L/s):	113.00
Peak Conveyance (maximum) Flow Rate (L/s):	113.00
Site Sediment Transport Rate (kg/ha/yr):	

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EF4	77
EF6	84
EF8	87
EF10	90
EF12	92

Recommended Stormceptor EF Model: EF4

Estimated Net Annual Sediment (TSS) Load Reduction (%): 77

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

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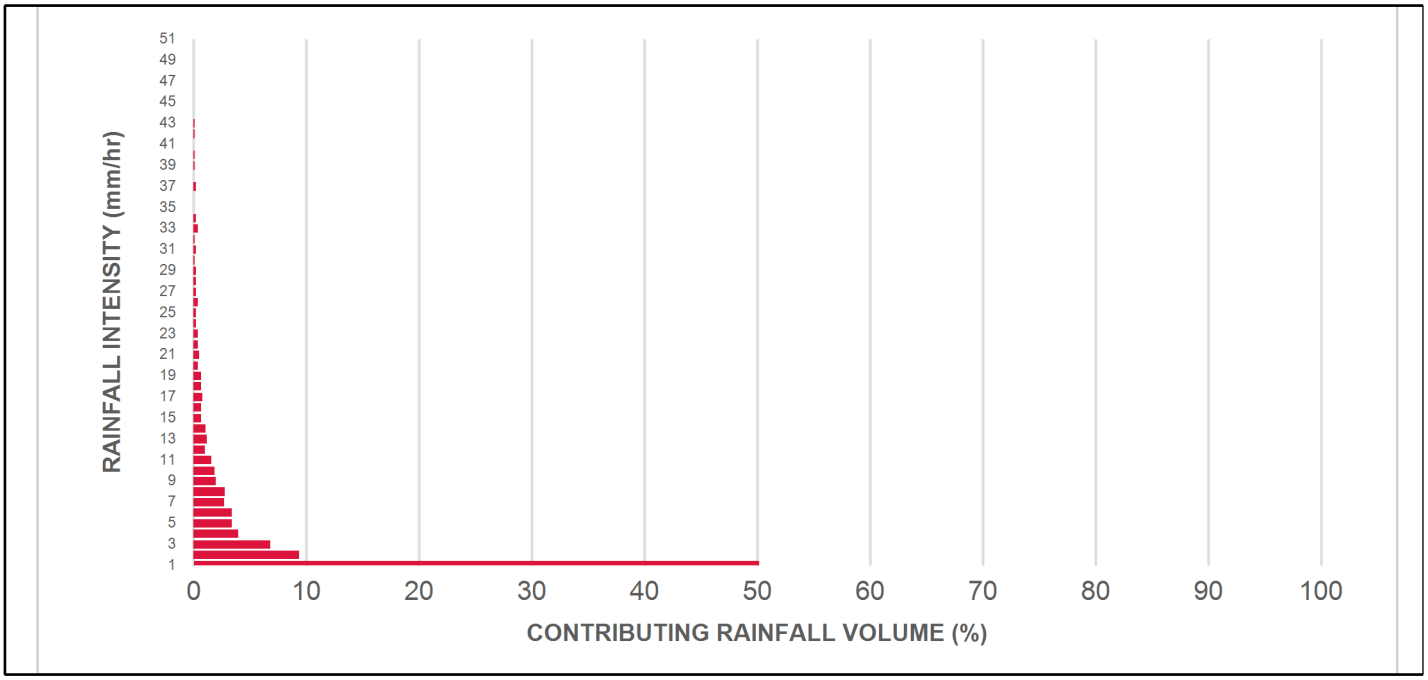
Upstream Flow Controlled Results

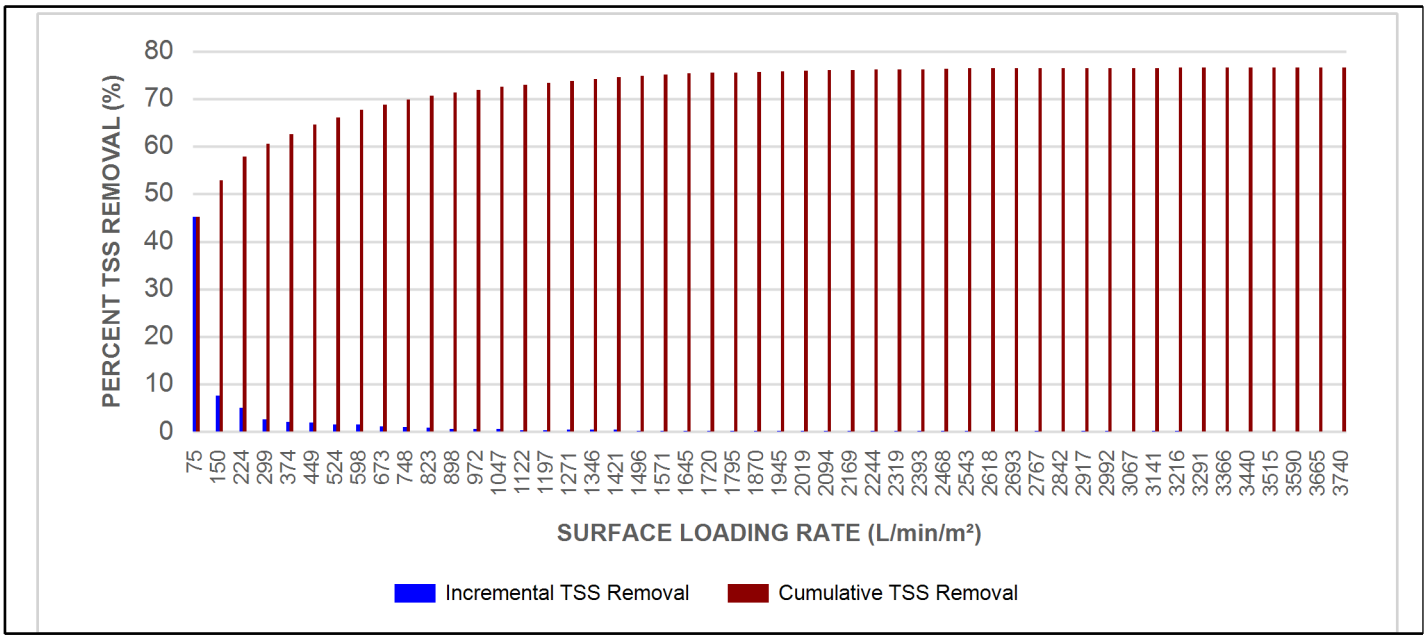
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
1	50.2	50.2	1.50	90.0	75.0	90	45.2	45.2
2	9.4	59.6	2.99	180.0	150.0	81	7.7	52.8
3	6.8	66.4	4.49	269.0	224.0	74	5.0	57.9
4	4.0	70.4	5.98	359.0	299.0	67	2.7	60.6
5	3.4	73.8	7.48	449.0	374.0	61	2.1	62.6
6	3.4	77.2	8.98	539.0	449.0	58	2.0	64.6
7	2.7	79.9	10.47	628.0	524.0	57	1.5	66.1
8	2.8	82.7	11.97	718.0	598.0	56	1.6	67.7
9	2.0	84.7	13.46	808.0	673.0	56	1.1	68.8
10	1.9	86.6	14.96	898.0	748.0	55	1.1	69.8
11	1.6	88.2	16.45	987.0	823.0	55	0.9	70.7
12	1.0	89.2	17.95	1077.0	898.0	55	0.5	71.3
13	1.2	90.4	19.45	1167.0	972.0	54	0.7	71.9
14	1.1	91.5	20.94	1257.0	1047.0	55	0.6	72.5
15	0.7	92.2	22.44	1346.0	1122.0	56	0.4	72.9
16	0.7	92.9	23.93	1436.0	1197.0	56	0.4	73.3
17	0.8	93.7	25.43	1526.0	1271.0	57	0.5	73.8
18	0.7	94.4	26.93	1616.0	1346.0	58	0.4	74.2
19	0.7	95.1	28.42	1705.0	1421.0	58	0.4	74.6
20	0.4	95.5	29.92	1795.0	1496.0	55	0.2	74.8
21	0.5	96.0	31.41	1885.0	1571.0	53	0.3	75.1
22	0.4	96.4	32.91	1975.0	1645.0	50	0.2	75.3
23	0.4	96.8	34.40	2064.0	1720.0	48	0.2	75.5
24	0.2	97.0	35.90	2154.0	1795.0	46	0.1	75.5
25	0.2	97.2	37.40	2244.0	1870.0	44	0.1	75.6

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 (%)
26	0.4	97.6	38.89	2334.0	1945.0	43	0.2	75.8
27	0.2	97.8	40.39	2423.0	2019.0	41	0.1	75.9
28	0.2	98.0	41.88	2513.0	2094.0	40	0.1	76.0
29	0.2	98.2	43.38	2603.0	2169.0	38	0.1	76.0
30	0.1	98.3	44.88	2693.0	2244.0	37	0.0	76.1
31	0.2	98.5	46.37	2782.0	2319.0	36	0.1	76.2
32	0.1	98.6	47.87	2872.0	2393.0	35	0.0	76.2
33	0.4	99.0	49.36	2962.0	2468.0	34	0.1	76.3
34	0.2	99.2	50.86	3052.0	2543.0	33	0.1	76.4
35	0.8	100.0	52.36	3141.0	2618.0	32	0.3	76.6
36	0.0	100.0	53.85	3231.0	2693.0	32	0.0	76.6
37	0.2	100.2	55.35	3321.0	2767.0	31	0.1	76.7
38	-0.2	100.0	56.84	3411.0	2842.0	30	N/A	76.6
39	0.1	100.1	58.34	3500.0	2917.0	28	0.0	76.7
40	0.1	100.2	59.83	3590.0	2992.0	28	0.0	76.7
41	-0.2	100.0	61.33	3680.0	3067.0	28	N/A	76.6
42	0.1	100.1	62.83	3770.0	3141.0	27	0.0	76.7
43	0.1	100.2	64.32	3859.0	3216.0	26	0.0	76.7
44	-0.2	100.0	65.82	3949.0	3291.0	26	N/A	76.6
45	0.0	100.0	67.31	4039.0	3366.0	25	0.0	76.6
46	0.0	100.0	68.81	4129.0	3440.0	24	0.0	76.6
47	0.0	100.0	70.31	4218.0	3515.0	24	0.0	76.6
48	0.0	100.0	71.80	4308.0	3590.0	24	0.0	76.6
49	0.0	100.0	73.30	4398.0	3665.0	23	0.0	76.6
50	0.0	100.0	74.79	4488.0	3740.0	22	0.0	76.6
Estimated Net Annual Sediment (TSS) Load Reduction =								**77 %**

RAINFALL DATA FROM ST CATHARINES AP RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



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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
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

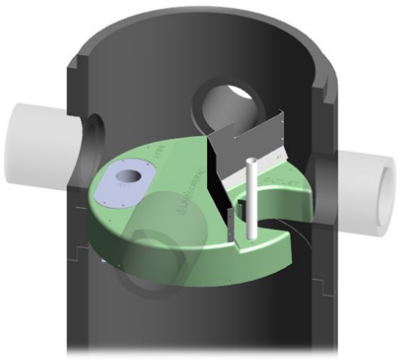
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test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

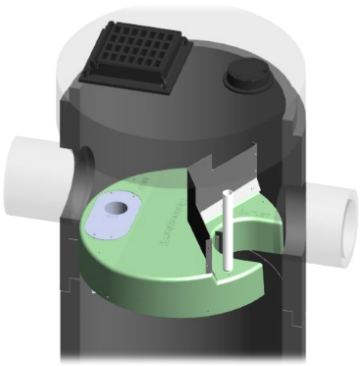
DESIGN FLEXIBILITY

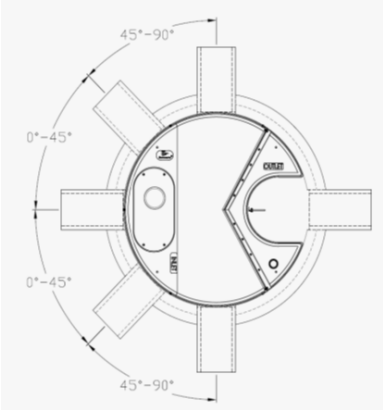
►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend 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
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 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^3 sediment / 265 L 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.

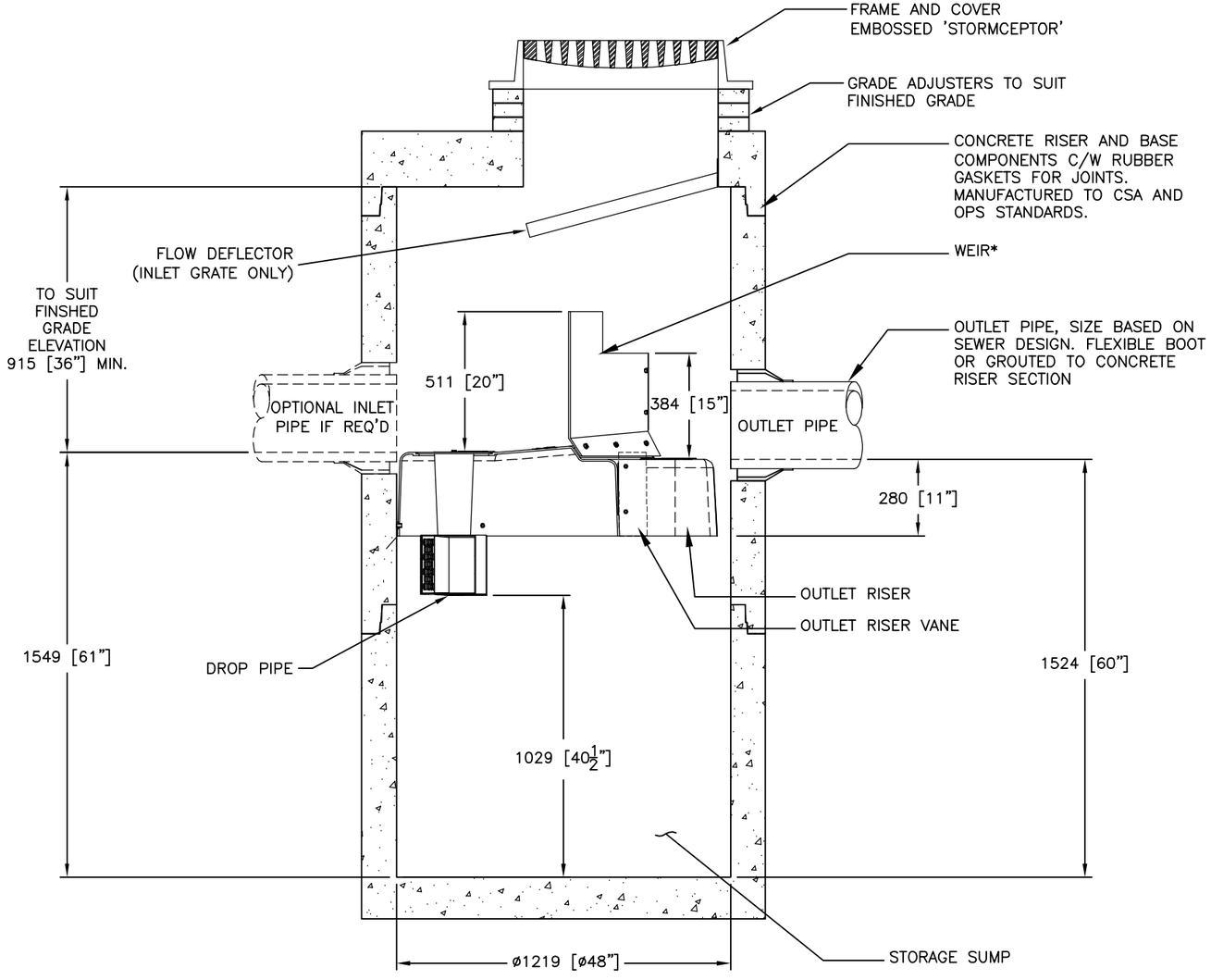
3.2 SIZING METHODOLOGY

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 shall be determined using historical rainfall data and a sediment removal performance curve derived from the actual third-party verified laboratory testing data. The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

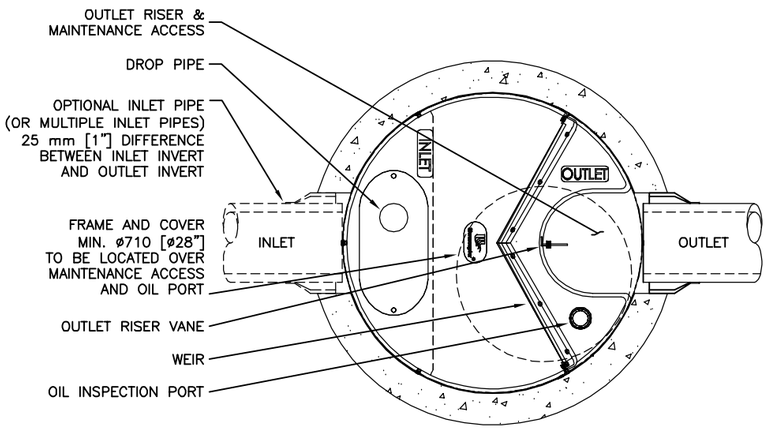
3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

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.**

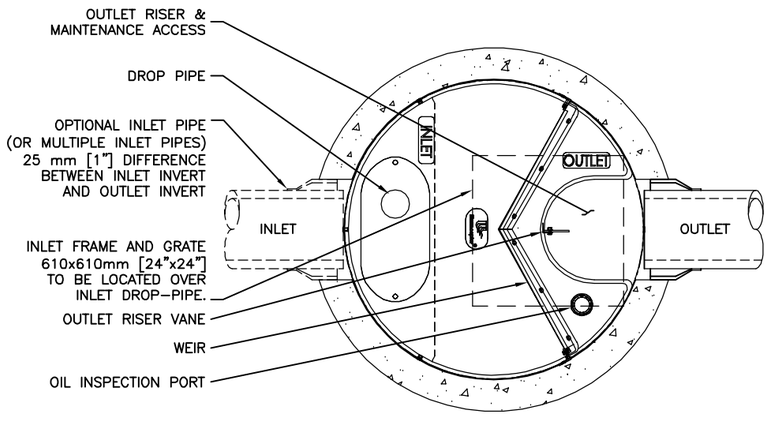
3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m^2.



SECTION VIEW



PLAN VIEW (STANDARD)



PLAN VIEW (INLET TOP)

FOR SITE SPECIFIC DRAWINGS PLEASE CONTACT YOUR LOCAL STORMCEPTOR REPRESENTATIVE. SITE SPECIFIC DRAWINGS ARE BASED ON THE BEST AVAILABLE INFORMATION AT THE TIME. SOME FIELD REVISIONS TO THE SYSTEM LOCATION OR CONNECTION PIPING MAY BE NECESSARY BASED ON AVAILABLE SPACE OR SITE CONFIGURATION REVISIONS. ELEVATIONS SHOULD BE MAINTAINED EXCEPT WHERE NOTED ON BYPASS STRUCTURE (IF REQUIRED).

GENERAL NOTES:

* MAXIMUM SURFACE LOADING RATE (SLR) INTO LOWER CHAMBER THROUGH DROP PIPE IS 1135 L/min/m^2 (27.9 gpm/ft^2) FOR STORMCEPTOR EF4 AND 535 L/min/m^2 (13.1 gpm/ft^2) FOR STORMCEPTOR EFO4 (OIL CAPTURE CONFIGURATION). WEIR HEIGHT IS 150 mm (6 INCH) FOR EF04.

1. ALL DIMENSIONS INDICATED ARE IN MILLIMETERS (INCHES) UNLESS OTHERWISE SPECIFIED.
2. STORMCEPTOR STRUCTURE INLET AND OUTLET PIPE SIZE AND ORIENTATION SHOWN FOR INFORMATIONAL PURPOSES ONLY.
3. UNLESS OTHERWISE NOTED, BYPASS INFRASTRUCTURE, SUCH AS ALL UPSTREAM DIVERSION STRUCTURES, CONNECTING STRUCTURES, OR PIPE CONDUITS CONNECTING TO COMPLETE THE STORMCEPTOR SYSTEM SHALL BE PROVIDED AND ADDRESSED SEPARATELY.
4. DRAWING FOR INFORMATION PURPOSES ONLY. REFER TO ENGINEER'S SITE/UTILITY PLAN FOR STRUCTURE ORIENTATION.
5. NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS SUBMITTED 10 DAYS PRIOR TO PROJECT BID DATE, OR AS DIRECTED BY THE ENGINEER OF RECORD.

INSTALLATION NOTES

A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE (LIFTING CLUTCHES PROVIDED)
C. CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT)
D. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT THE DEVICE FROM CONSTRUCTION-RELATED EROSION RUNOFF.
E. DEVICE ACTIVATION, BY CONTRACTOR, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE STORMCEPTOR UNIT IS CLEAN AND FREE OF DEBRIS.

STANDARD DETAIL
NOT FOR CONSTRUCTION

SITE SPECIFIC DATA REQUIREMENTS

STORMCEPTOR MODEL	EF4
STRUCTURE ID	*
WATER QUALITY FLOW RATE (L/s)	*
PEAK FLOW RATE (L/s)	*
RETURN PERIOD OF PEAK FLOW (yrs)	*
DRAINAGE AREA (HA)	*
DRAINAGE AREA IMPERVIOUSNESS (%)	*

PIPE DATA:	I.E.	MAT'L	DIA	SLOPE %	HGL
INLET #1	*	*	*	*	*
INLET #2	*	*	*	*	*
OUTLET	*	*	*	*	*

* PER ENGINEER OF RECORD

MARK	DATE	REVISION DESCRIPTION	BY
1	6/8/18	UPDATES	JSK
0	5/26/17	INITIAL RELEASE	JSK

Stormceptor® EF

SCALE = NTS

imbrium®
7007 RIDGE ROAD, SUITE 350, HANOVER, MD 21076
USA 888-279-9828 CA 800-388-4601 INTL +1-416-960-9900

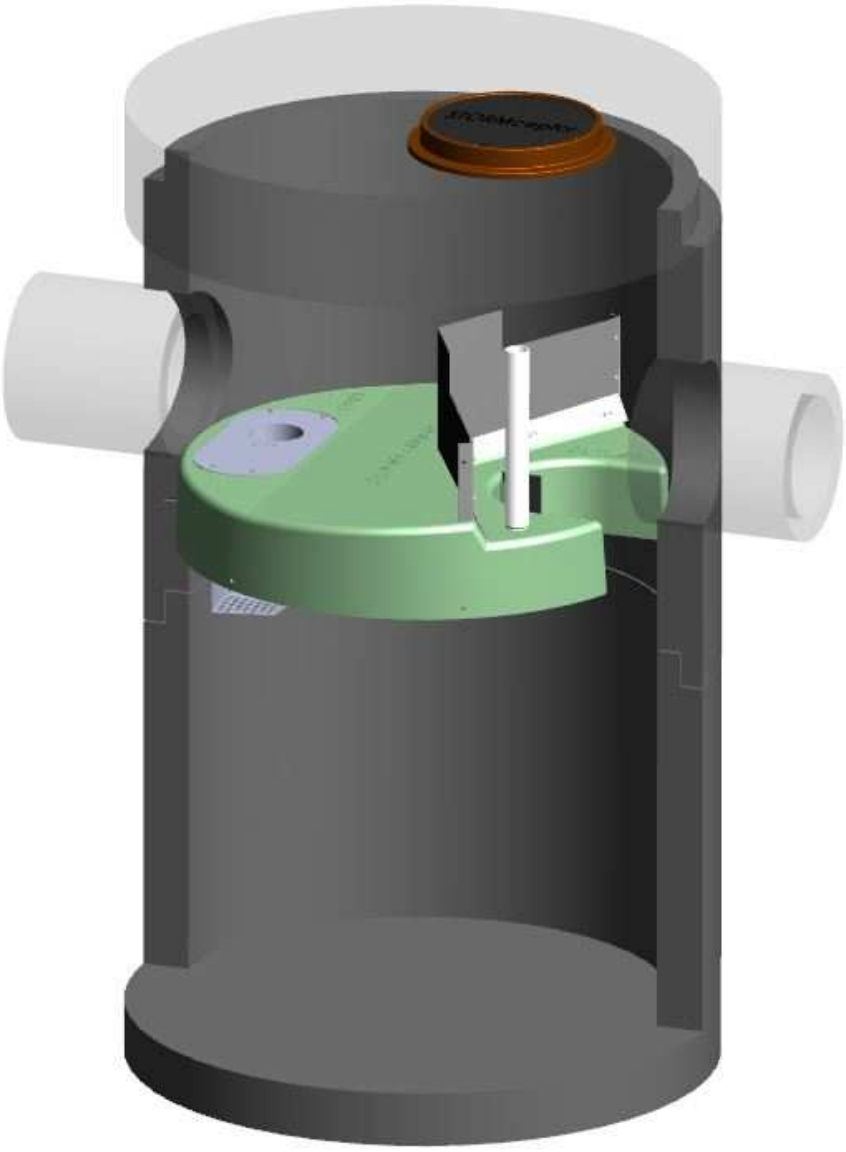
DATE: 5/26/2017

DESIGNED:	DRAWN:
JSK	JSK
CHECKED:	APPROVED:
BSF	SP
PROJECT No.:	SEQUENCE No.:
EF4	*

SHEET: 1 OF 1

Stormceptor® EF

Owner's Manual



Stormceptor is protected by one or more of the following patents:

Canadian Patent No. 2,137,942
Canadian Patent No. 2,180,305
Canadian Patent No. 2,327,768
Canadian Patent No. 2,694,159
Canadian Patent No. 2,697,287
U.S. Patent No. 6,068,765
U.S. Patent No. 6,371,690
U.S. Patent No. 7,582,216
U.S. Patent No. 7,666,303
Australia Patent No. 693.164
Australia Patent No. 729,096
Australia Patent No. 2008,279,378
Australia Patent No. 2008,288,900
Japanese Patent No. 5,997,750
Japanese Patent No. 5,555,160
Korean Patent No. 0519212
Korean Patent No. 1451593
New Zealand Patent No. 583,008
New Zealand Patent No. 583,583
South African Patent No. 2010/00682
South African Patent No. 2010/01796
Patent pending

Table of Contents:

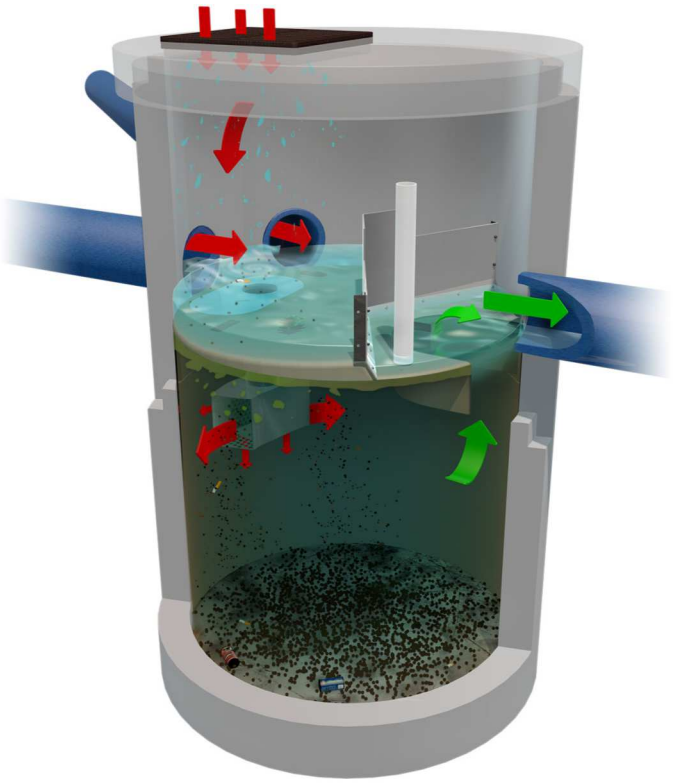
OVERVIEW

Stormceptor® EF is a continuation and evolution of the most globally recognized oil grit separator (OGS) stormwater treatment technology - ***Stormceptor®***. Also known as a hydrodynamic separator, the enhanced flow Stormceptor EF is a high performing oil grit separator that effectively removes a wide variety of pollutants from stormwater and snowmelt runoff at flow rates higher than the original Stormceptor. Stormceptor EF captures and retains sediment (TSS), free oils, gross pollutants and other pollutants that attach to particles, such as nutrients and metals. Stormceptor EF's patent-pending treatment and scour prevention platform ensures sediment is retained during all rainfall events.

Stormceptor EF offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe, multiple inlet pipes, and/or from the surface through an inlet grate. Stormceptor EF can also serve as a junction structure, accommodate a 90-degree inlet to outlet bend angle, and be modified to ensure performance in submerged conditions. With its scour prevention and internal bypass, Stormceptor EF can be installed online, eliminating the need for costly additional bypass structures.

OPERATION

- Stormwater enters the Stormceptor upper chamber through the inlet pipe(s) or a surface inlet grate. A specially designed insert reduces the influent velocity by creating a pond upstream of the insert's weir. Sediment particles immediately begin to settle. Swirling flow sweeps water, sediment, and floatables across the sloped surface of the insert to the inlet opening of the drop pipe, where a strong vortex draws water, sediment, oil, and debris down the drop pipe cone.
- Influent exits the cone into the drop pipe duct. The duct has two large rectangular outlet openings as well as perforations in the backside and floor of the duct. Influent is diffused through these various opening in multiple directions and at low velocity into the lower chamber.
- Free oils and other floatables rise up within the channel surrounding the central riser pipe and are trapped beneath the insert, while sediment settles to the sump. Pollutants are retained for later removal during maintenance cleaning.
- Treated effluent enters the outlet riser, moves upward, and discharges to the top side of the insert downstream of the weir, where it flows out the outlet pipe.
- During intense storm events with very high influent flow rates, the pond height on the upstream side of the weir may exceed the height of the weir, and the excess flow passes over the top of the weir to the downstream side of the insert, and exits through the outlet pipe. This internal bypass feature allows for in-line installation, avoiding the cost of additional bypass structures. During bypass, the pond separates sediment from all incoming flows, while full treatment in the lower chamber continues at the maximum flow rate.
- Stormceptor EF's patent-pending enhanced flow and scour prevention technology ensures pollutants are captured and retained, allowing excess flows to bypass during infrequent, high intensity storms.



COMPONENTS

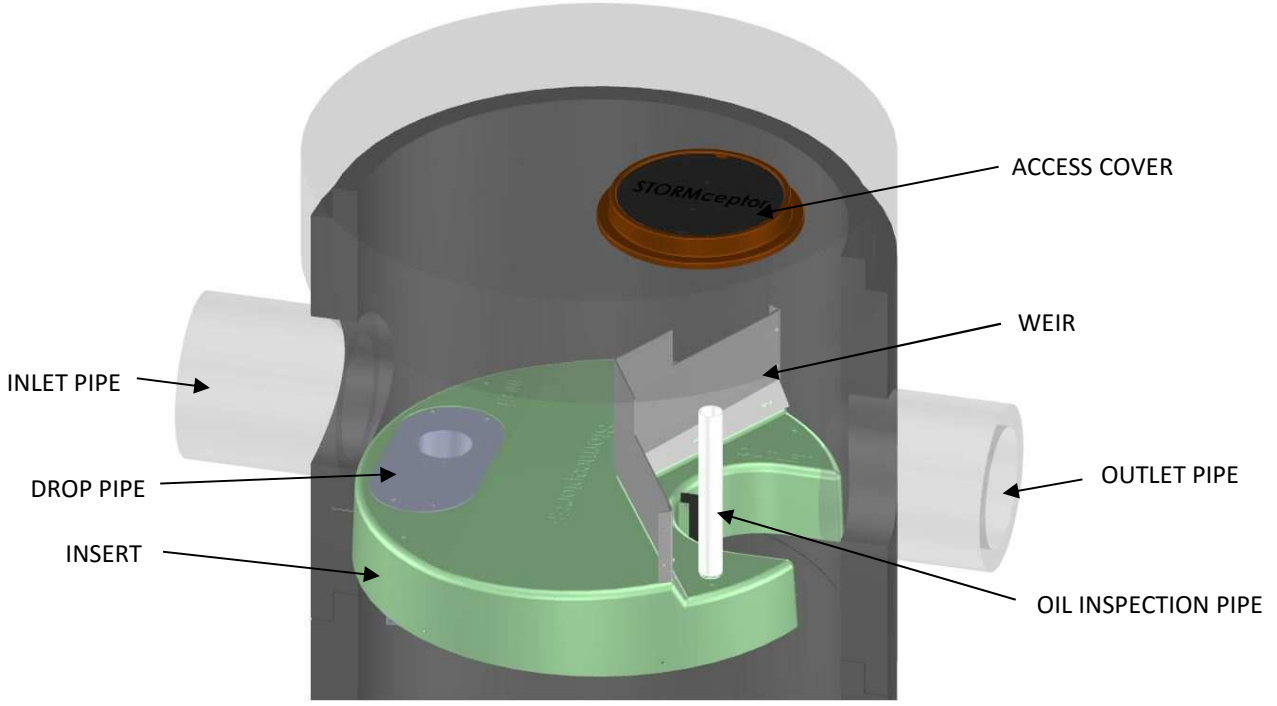


Figure 1

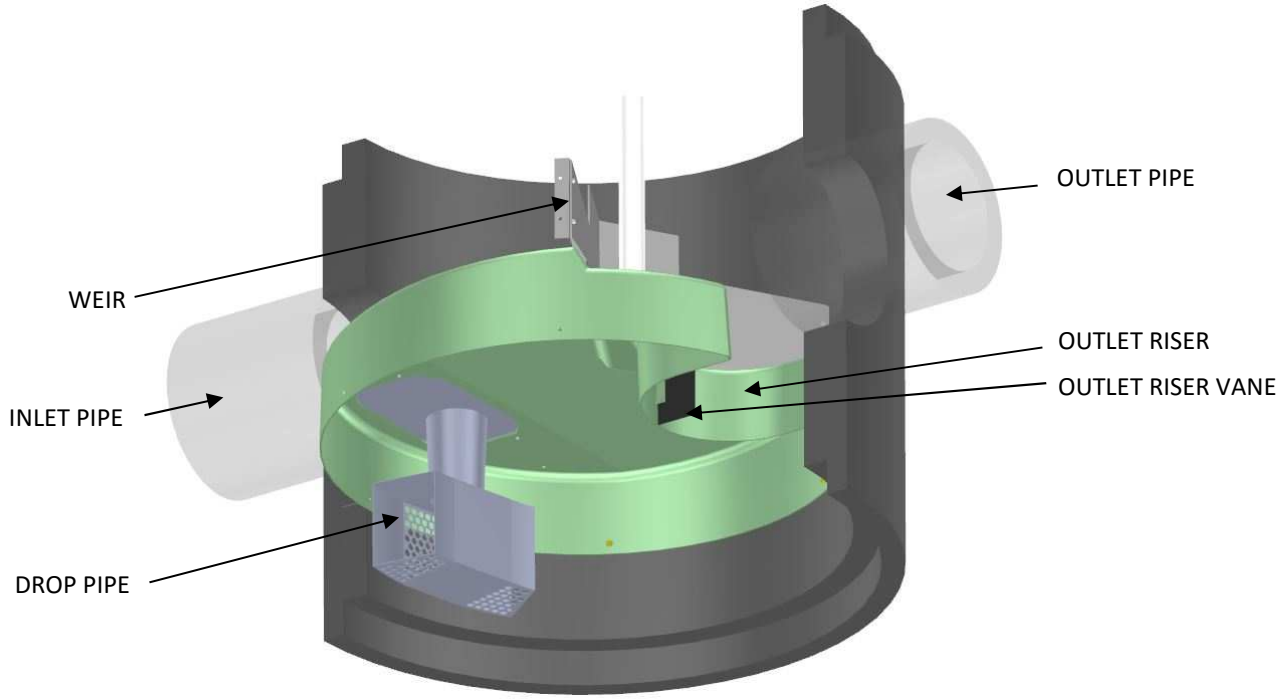


Figure 2

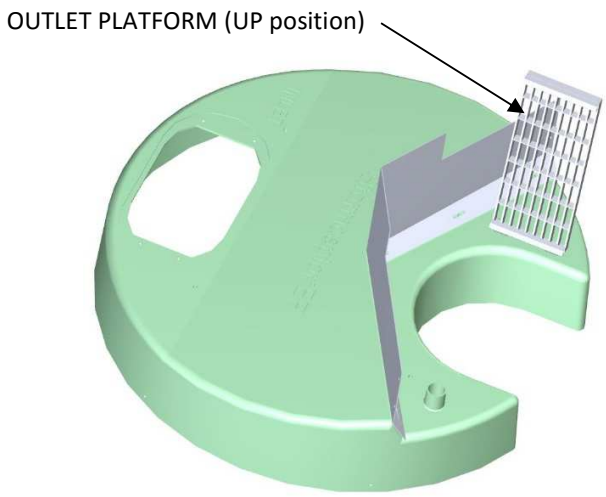


Figure 3A

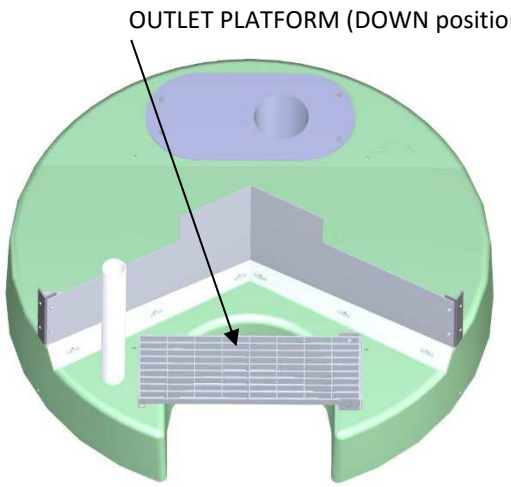


Figure 3B

- **Insert** – separates vessel into upper and lower chambers, and provides double-wall containment of hydrocarbons
- **Weir** – creates stormwater ponding and driving head on top side of insert
- **Drop pipe** – conveys stormwater and pollutants into the lower chamber
- **Outlet riser** – conveys treated stormwater from the lower chamber to the outlet pipe, and provides primary inspection and maintenance access into the lower chamber
- **Outlet riser vane** – prevents formation of a vortex in the outlet riser during high flow rate conditions
- **Outlet platform (optional)** – safety platform in the event of manned entry into the unit
- **Oil inspection pipe** – primary access for measuring oil depth

PRODUCT DETAILS

METRIC DIMENSIONS AND CAPACITIES

Table 1

Stormceptor Model	Inside Diameter (m)	Minimum Surface to Outlet Invert Depth (mm)	Depth Below Outlet Pipe Invert (mm)	Wet Volume (L)	Sediment Capacity [1] (m^3)	Hydrocarbon Storage Capacity [2] (L)	Maximum Flow Rate into Lower Chamber [3] (L/s)	Peak Conveyance Flow Rate [4] (L/s)
EF4 / EFO4	1.22	915	1524	1780	1.19	265	22.1 / 10.4	425
EF6 / EFO6	1.83	915	1930	5070	3.47	610	49.6 / 23.4	990
EF8 / EFO8	2.44	1219	2591	12090	8.78	1070	88.3 / 41.6	1700
EF10 / EFO10	3.05	1219	3251	23700	17.79	1670	138 / 65	2830
EF12 / EFO12	3.66	1524	3886	40800	31.22	2475	198.7 / 93.7	2830

[1] Sediment Capacity is measured from the floor to the bottom of the drop pipe cone. Sediment Capacity can be increased to accommodate specific site designs and pollutant loads. Contact your local representative for assistance.
[2] Hydrocarbon Storage Capacity is measured from the bottom of the outlet riser to the underside of the insert. Hydrocarbon Storage Capacity can be increased to accommodate specific site designs and pollutant loads. Contact your local representative for assistance.
[3] EF Maximum Flow Rate into Lower Chamber is based on a maximum surface loading rate (SLR) into the lower chamber of 1135 L/min/m^2.
EFO Maximum Flow Rate into Lower Chamber is based on a maximum surface loading rate (SLR) into the lower chamber of 535 L/min/m^2.
[4] Peak Conveyance Flow Rate is limited by a maximum velocity of 1.5 m/s.

U.S. DIMENSIONS AND CAPACITIES

Table 2

Stormceptor Model	Inside Diameter (ft)	Minimum Surface to Outlet Invert Depth (in)	Depth Below Outlet Pipe Invert (in)	Wet Volume (gal)	Sediment Capacity [1] (ft^3)	Hydrocarbon Storage Capacity [2] (gal)	Maximum Flow Rate into Lower Chamber [3] (cfs)	Peak Conveyance Flow Rate [4] (cfs)
EF4 / EFO4	4	36	60	471	42	70	0.78 / 0.37	15
EF6 / EFO6	6	36	76	1339	123	160	1.75 / 0.83	35
EF8 / EFO8	8	48	102	3194	310	280	3.12 / 1.47	60
EF10 / EFO10	10	48	128	6261	628	440	4.87 / 2.30	100
EF12 / EFO12	12	60	153	10779	1103	655	7.02 / 3.31	100

[1] Sediment Capacity is measured from the floor to the bottom of the drop pipe cone. Sediment Capacity can be increased to accommodate specific site designs and pollutant loads. Contact your local representative for assistance.
[2] Hydrocarbon Storage Capacity is measured from the bottom of the outlet riser to the underside of the insert. Hydrocarbon Storage Capacity can be increased to accommodate specific site designs and pollutant loads. Contact your local representative for assistance.
[3] EF Maximum Flow Rate into Lower Chamber is based on a maximum surface loading rate (SLR) into the lower chamber of 27.9 gpm/ft^2.
EFO Maximum Flow Rate into Lower Chamber is based on a maximum surface loading rate (SLR) into the lower chamber of 13.1 gpm/ft^2.
[4] Peak Conveyance Flow Rate is limited by a maximum velocity of 5 fps.

IDENTIFICATION

Each Stormceptor EF/EFO unit is easily identifiable by the trade name ***Stormceptor***® embossed on the access cover at grade as shown in **Figure 3**. The tradename ***Stormceptor***® is also embossed on the top of the insert upstream of the weir as shown in **Figure 3**.

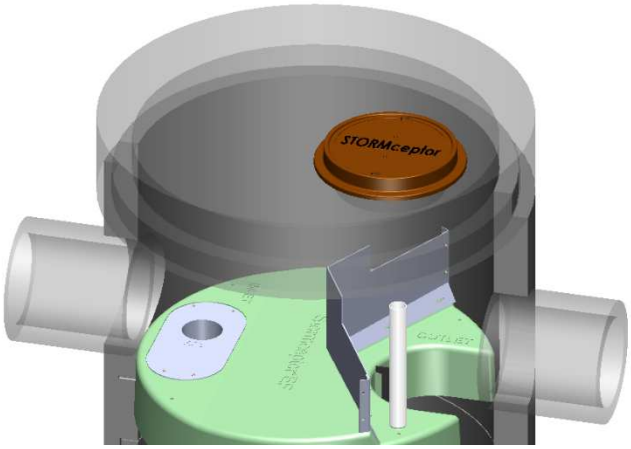


Figure 4

The specific Stormceptor EF/EFO model number is identified on the top of the aluminum Drop Pipe as shown in **Figure 4**. The unit serial number is identified on the top of the insert upstream of the weir as shown in **Figure 4**.

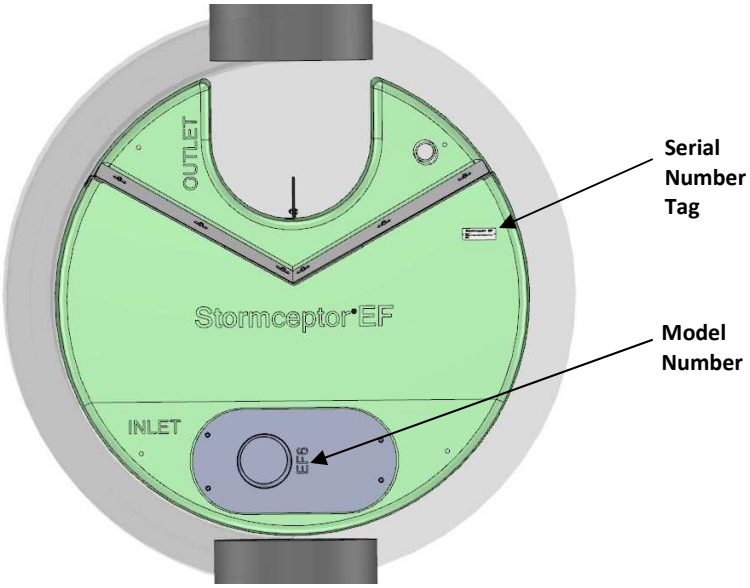


Figure 5

INSPECTION AND MAINTENANCE

It is very important to perform regular inspection and maintenance. Regular inspection and maintenance ensures maximum operation efficiency, keeps maintenance costs low, and provides continued of natural waterways.

Quick Reference

- Typical inspection and maintenance is performed from grade
- Remove manhole **cover(s)** or **inlet grate** to access insert and lower chamber
  NOTE: EF4/EFO4 requires the removal of a **flow deflector** beneath inlet grate
- Use Sludge Judge® or similar sediment probe to check sediment depth through the **outlet riser**
- Oil dipstick can be inserted through the **oil inspection pipe**
- Visually inspect the **insert** for debris, remove debris if present
- Visually inspect the **drop pipe** opening for blockage, remove blockage if present
- Visually inspect **insert** and **weir** for damage, schedule repair if needed
- Insert vacuum hose and jetting wand through the outlet riser and extract sediment and floatables
- Replace flow deflector (EF4/EFO4), inlet grate, and cover(s)
- **NOTE:** If the unit has an **outlet platform**, the outlet platform is typically in the UP position (see Figure 3A) for normal treatment conditions, and for inspection and maintenance. If manned entry into the unit is required, the outlet platform must first be placed in the DOWN position (see Figure 3B). After manned entry is completed, return the outlet platform to the UP position for treatment.

When is inspection needed?

- Post-construction inspection is required prior to putting the Stormceptor into service.
- Routine inspections are recommended during the first year of operation to accurately assess pollutant accumulation.
- Inspection frequency in subsequent years is based on the maintenance plan developed in the first year.
- Inspections should also be performed immediately after oil, fuel, or other chemical spills.

What equipment is typically required for inspection?

- Manhole access cover lifting tool
- Oil dipstick / Sediment probe with ball valve (typically ¾-inch to 1-inch diameter)
- Flashlight
- Camera
- Data log / Inspection Report
- Safety cones and caution tape
- Hard hat, safety shoes, safety glasses, and chemical-resistant gloves

When is maintenance cleaning needed?

- If the post-construction inspection indicates presence of construction sediment of a depth greater than a few inches, maintenance is recommended at that time.
- For optimum performance and normal operation the unit should be cleaned out once the sediment depth reaches the recommended maintenance sediment depth, see **Table 3**.
- Maintain immediately after an oil, fuel, or other chemical spill.

Table 3

Recommended Sediment Depths for Maintenance Service*	
MODEL	Sediment Depth (in/mm)
EF4 / EFO4	8 / 203
EF6 / EFO6	12 /305
EF8 / EFO8	24 / 610
EF10 / EFO10	24 / 610
EF12 / EFO12	24 / 610

* Based on a minimum distance of 40 inches (1,016 mm) from bottom of outlet riser to top of sediment bed

The frequency of inspection and maintenance may need to be adjusted based on site conditions to ensure the unit is operating and performing as intended. Maintenance costs will vary based on the size of the unit, site conditions, local requirements, disposal costs, and transportation distance.

What equipment is typically required for maintenance?

- Vacuum truck equipped with water hose and jet nozzle
- Small pump and tubing for oil removal
- Manhole access cover lifting tool
- Oil dipstick / Sediment probe with ball valve (typically ¾-inch to 1-inch diameter)
- Flashlight
- Camera
- Data log / Inspection Report
- Safety cones
- Hard hats, safety shoes, safety glasses, chemical-resistant gloves, and hearing protection for service providers
- Gas analyzer, respiratory gear, and safety harness for specially trained personnel if confined space entry is required (adhere to all OSHA / CCOSH standards)

What conditions can compromise Stormceptor performance?

- Presence of construction sediment and debris in the unit prior to activation
- Excessive sediment depth beyond the recommended maintenance depth
- Oil spill in excess of the oil storage capacity
- Clogging or restriction of the drop pipe inlet opening with debris
- Downstream blockage that results in a backwater condition

Maintenance Procedures

- Maintenance should be conducted during dry weather conditions when no flow is entering the unit.
- Stormceptor is maintained from grade through a standard surface manhole access cover or inlet grate.
- In the case of submerged or tailwater conditions, extra measures are likely required, such as plugging the inlet and outlet pipes prior to conducting maintenance.
- Inspection and maintenance of upstream catch basins and other stormwater conveyance structures is also recommended to extend the time between future maintenance cycles.

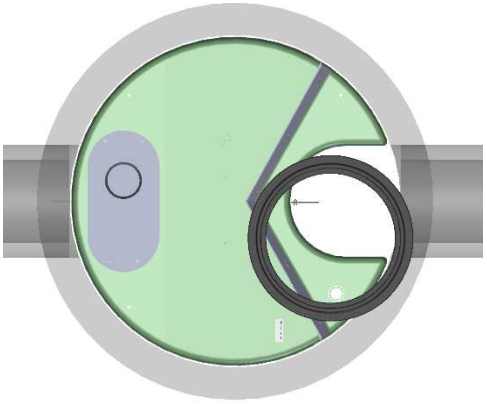


Figure 6

- Sediment depth inspections are performed through the **Outlet Riser** and oil presence can be determined through the **Oil Inspection Pipe**.
- Oil presence and sediment depth are determined by inserting a Sludge Judge® or measuring stick to quantify the pollutant depths.

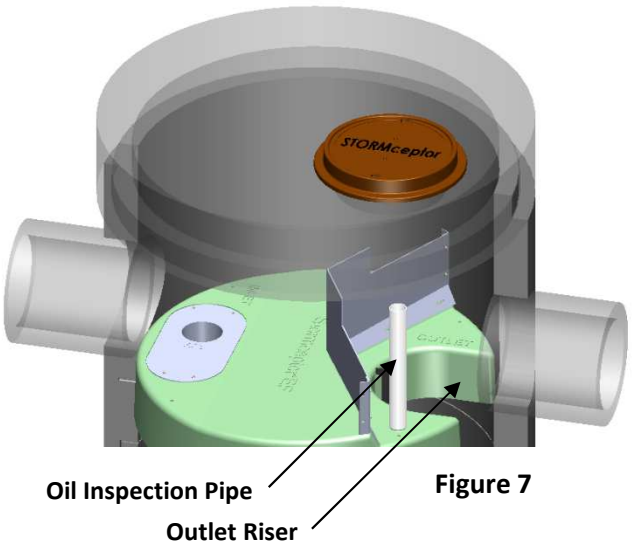


Figure 7

Figure 8

- Visually inspect the insert, weir, and drop pipe inlet opening to ensure there is no damage or blockage.
- **NOTE:** If the unit has an **outlet platform**, the outlet platform is typically in the UP position (see Figure 3A) for normal treatment conditions, and for inspection and maintenance. If manned entry into the unit is required, the outlet platform must first be placed in the DOWN position (see Figure 3B). After manned entry is completed, return the outlet platform to the UP position for treatment.

- When maintenance is required, a standard vacuum truck is used to remove the pollutants from the lower chamber of the unit through the **Outlet Riser**.

Figure 9

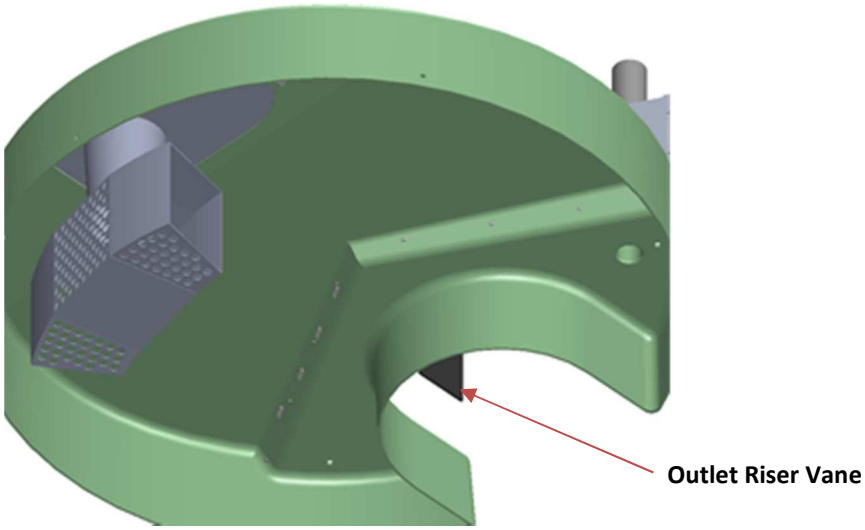
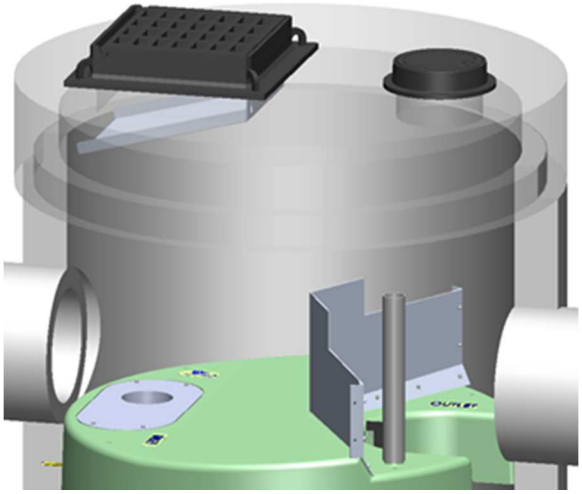


Figure 10

NOTE: The Outlet Riser Vane is durable and flexible and designed to allow maintenance activities with minimal, if any, interference.

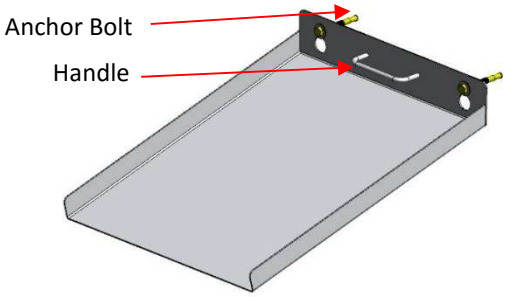
Removable Flow Deflector

- Top grated inlets for the Stormceptor EF4/EFO4 model requires a removable flow deflector staged underneath a 24-inch x 24-inch (600 mm x 600 mm) square inlet grate to direct flow towards the inlet side of the insert, and avoid flow and pollutants from entering the outlet side of the insert from grade. The EF6/EFO6 and larger models do not require the flow deflector.



How to Remove:

1. Loosen anchor bolts
2. Pull up and out using the handle



Removable Flow Deflector

Figure 11

Hydrocarbon Spills

Stormceptor is often installed on high pollutant load hotspot sites with vehicular traffic where hydrocarbon spill potential exists. Should a spill occur, or presence of oil be identified within a Stormceptor EF/EFO, it should be cleaned immediately by a licensed liquid waste hauler.

Disposal

Maintenance providers are to follow all federal, state/ provincial, and local requirements for disposal of material.

Oil Sheens

When oil is present in stormwater runoff, a sheen may be noticeable at the Stormceptor outlet. An oil rainbow or sheen can be noticeable at very low oil concentrations (< 10 mg/L). Despite the appearance of a sheen, Stormceptor EF/EFO may still be functioning as intended.

Oil Level Alarm

To mitigate spill liability with 24/7 detection, an electronic monitoring system can be employed to trigger a visual and audible alarm when a pre-set level of oil is captured within the lower chamber or when an oil spill occurs. The oil level alarm is available as an optional feature to include with Stormceptor EF/EFO as shown in **Figure 11**. For additional details about the Oil Level Alarm please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-systems.

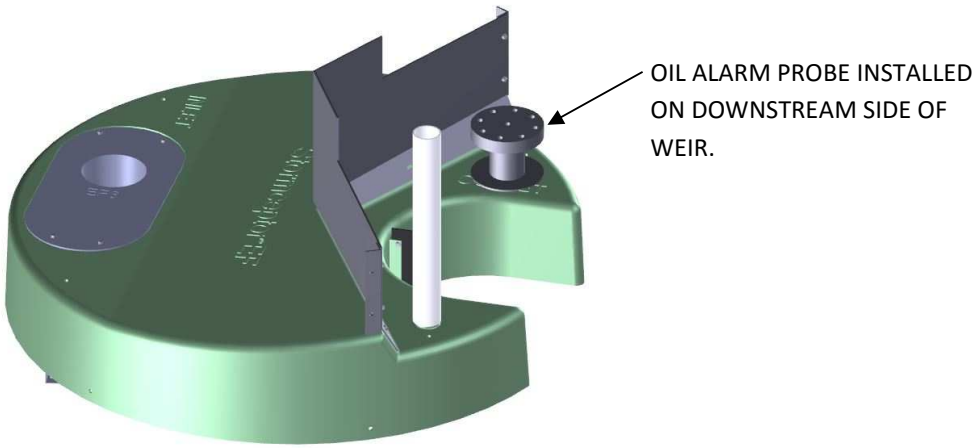


Figure 12

Replacement Parts

Stormceptor has no moving parts to wear out. Therefore inspection and maintenance activities are generally focused on pollutant removal. Since there are no moving parts during operation in a Stormceptor, broken, damaged, or worn parts are not typically encountered. However, if replacement parts are necessary, they may be purchased by contacting your local Stormceptor representative.

Stormceptor Inspection and Maintenance Log

Stormceptor Model No: _____

Serial Number: _____

Installation Date: _____

Location Description of Unit: _____

Recommended Sediment Maintenance Depth: _____

DATE	SEDIMENT DEPTH (inch or mm)	OIL DEPTH (inch or mm)	SERVICE REQUIRED (Yes / No)	MAINTENANCE PERFORMED	MAINTENANCE PROVIDER	COMMENTS

Other Comments:

Contact Information

Questions regarding Stormceptor EF/EFO can be addressed by contacting your local Stormceptor representative or by visiting our website at **www.stormceptor.com.**

Imbrium Systems Inc. & Imbrium Systems LLC

Canada	1-416-960-9900 / 1-800-565-4801
United States	1-301-279-8827 / 1-888-279-8826
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