FUNCTIONAL SERVICING & STORMWATER MANAGEMENT REPORT

CITY PARK HOMES(STREETSVILLE) INC.

STANDARD CONDOMINIUM

**16 JAMES STREET, 2 WILLIAM STREET,
6, 10, 12 QUEEN ST S**

**CITY OF MISSISSAUGA
REGIONAL MUNICIPALITY OF PEEL**

FILE NO. 220-M108

**Revised:
DECEMBER 9, 2022**

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1.0 INTRODUCTION

The purpose of this report is to define the existing municipal services to the subject parcel of land and the proposed servicing scheme in support of the proposed 8-storey mid-rise condominium off William Street and Queen Street South. The development consists of 234 condominium units along private standard condominium road.

The proposed development is located on the west side of Queen Street South and north of William Street intersection. Property includes 16 James Street, 2 William Street, 6, 10, 12 Queen Street South addresses.

It is intended that this report will result in approval in principle of the design proposal by the City of Mississauga, Regional Municipality of Peel and any other relevant authorities.

2.0 SITE AREA INFORMATION

The subject site is part of Lots 21, 22, 23, 25, 26, 27, 28, 29 & 30, Reg. Plan STR-2 in the City of Mississauga and Regional Municipality of Peel.

The proposed development is located on the west side of Queen Street South, north of William Street. The site has been previously occupied by four (4) residential dwellings and industrial shop. All buildings will be demolished prior to construction.

The site area is approx. 0.7748ha including portion of easement at William Street.

The site is surrounded by existing residential homes to the north and south. Queen Street South creates a frontage along the east boundary lines and west boundary is adjacent to CPR Rail track. ***Refer to Key Plan.***

The majority of the site is relatively flat in topography with gentle sloping towards the southeast with a grade differential of approx. 1.0m. The residential dwellings currently occupy existing lands.

The proposed development will consist of an 8-storey mid-rise condominium.

3.0 TRANSPORTATION SYSTEM

The site is in a good location to be serviced by existing local roads. Queen Street South and William Street will provide good access to other major arterial roads, such as Britannia Road and to major highways, such as Highway 401.

Private road will be completed as per City of Mississauga **CM 2211.157** engineering standards.

A new single access and driveway will be constructed from James Street for the proposed mid-rise condominium. The access is located approximately 53.85m from the priority intersection and will provide full moves access for the proposed development.

The existing accesses to William Street will be removed and road pavement elbow will be restored to City of Mississauga Standards using 8.0m wide pavement. Boulevard area, asphalt and granular surface will be removed and restored with top soil and sod.

4.0 STORM DRAINAGE SYSTEM

Based on existing drainage maps from City of Mississauga records and Site Specific Streetsville Area Drainage Report (May 1994), the site runoff contributes towards a storm sewer on Queen Street South and William Street. The site was developed, and existing single dwellings, commercial repair shop garage and sheds have been demolished and debris removed off site.

Based on the findings and recommendations of the Streetsville Drainage Report, the existing storm sewers on James Street and William Street are in good condition and do not experience surcharge at 10-yr storm intensity. Both of these storm sewers join storm sewers from Queen Street South and Henry Street, and further discharge directly to Mullet Creek. The 375mm storm sewer on Queen Street South has been shown to be at capacity for 10-yr storm events. The report indicates no storm sewer is surcharged at 10-yr conditions through all legs to outfall. Portion of the report figures and design sheet are enclosed in ***Appendix A***.

We will utilise both sewers for storm connection.

The existing conditions have been identified regarding the area contribution to Queen Street South and William Street storm sewers. The existing drainage boundary on Queen Street South contributes approx. 0.33ha to the existing 375mm storm sewer on Queen Street South. The existing drainage boundary on William Street contributes approx. 0.44ha to the existing 450mm storm on William Street.

Under current site conditions, the existing runoff to each sewer respectively is as follows:

Ex. Q_{QUEEN} = 0.33 x 0.4 x 99.18 / 360
= 0.036m³/s

Ex. $Q_{WILLIAM}$ = 0.44 x 0.4 x 99.18 / 360
= 0.048m³/s

Based on the architectural site configuration, slight modification to drainage boundaries will be proposed.

The site will also be restricted to pre-development conditions based on Mullet Creek CVC requirements. Based on site contribution, the allowable discharge to Queen Street South and William Street storm sewers is as follows:

Allowable Discharge

(Queen) $Q_{2\text{-yr}}$ = 0.33 x 59.89 x 0.40 / 360
= 0.022m³/s

(William) $Q_{2\text{-yr}}$ = 0.44 x 59.89 x 0.40 / 360
= 0.029m³/s

The allowable discharge for each drainage area is smaller than the existing site runoff contribution. The existing municipal sewers have capacity to receive proposed discharge. Refer to ***Appendix A*** for the storm sewer design sheet.

Based on City of Mississauga stormwater management criteria for Mullet Creek, on-site stormwater management will be provided for the development to restrict post-development flows to pre-development level for 2-yr storm event, for 100-yr storm event.

4.1 Drainage to Queen Street South

A landscaped area of 514.78m^2 along the north face of the building and a streetscaping area of 113.99m^2 for the live/work units fronting Queen Street South will be captured into storm sewer or drained through surface sheet flow which is considered as uncontrolled runoff.

The weighted runoff coefficient is calculated below.

Area Description	Area (m^2)	Runoff Coefficient
Streetscaping	114	0.90
Landscape	515	0.25
Total	629	**0.3678**

Using Rational Method, the proposed runoff is as follows:

$Q_{100\text{-yr}}$ = 0.0629 x 140.69 x 0.4598 / 360
= 0.011m^3/s

The proposed runoff is less than the allowable discharge.

4.2 Drainage to William Street

The remaining area of the site, 0.7237ha, drains to William Street. The weighted runoff coefficient is calculated below.

Area Description	Area (m^2)	Runoff Coefficient
Building/Roof	4757	0.90
Paved	1331	0.90
Landscape	1149	0.25
Total	7237	**0.797**

Using Rational Method for the 100-yr storm event calculation and previously established allowable discharge to William Street, the total runoff and required detention volume are as follows:

YEAR
STORM
100 year
CITY
Mississauga

C = **0.996**
A (ha) = **0.72373**
Allow. Discharge Qa (m3/s) = **0.048488**
Safety Factor Sf = **0%**

Max. Required Detention (m3) = ***244.74***

RAINFALL DURATION	**RAINFALL INTENSITY**	**TOTAL RUNOFF**	**INFLOW VOLUME**	**OUTFLOW VOLUME**	**REQUIRED DETENTION VOLUME (m^3)**
T_c (min)	***I (mm/hr)***	***Q=CIA/360 (m^3/sec)***	**V_i (m^3)**	**V_o (m^3)**	***D=(Vi-Vo)*Sf***
5	242.53	0.4856	145.68	15.09	130.59
10	176.31	0.3530	211.81	29.09	182.72
15	140.69	0.2817	253.53	43.13	210.39
20	118.12	0.2365	283.81	57.20	226.61
25	102.41	0.2051	307.58	71.29	236.29
30	90.77	0.1818	327.16	85.40	241.76
35	81.77	0.1637	343.83	99.51	244.32
40	74.58	0.1493	358.38	113.65	**244.74**
45	68.68	0.1375	371.31	127.79	243.52
50	63.75	0.1277	382.95	141.94	241.01

Since the total runoff to William Street is greater than the allowable discharge, on-site stormwater management is required. The maximum detention volume required is **244.74m³**. The required storage volume will be provided by an underground storm sewer system and a stormwater tank.

4.2.1 Underground Storm Sewer System

An area of 0.248ha, comprised of the paved and landscaped area, will be collected at the catchbasins and directed to the outlet through storm sewers.

Detailed storage requirements will be presented during site plan approval process. The storage volume provided by the underground storm sewer system is as follows:

	Size (mm)	**Slope (%)**	**Flow Area (m^2)**	**Sewer Length (m)**	**Available Storage Volume (m^3)**
STM Sewer	1050	0.30	0.8659	99.56	86.21
STM MH #2 STM MH #3 STM MH #4	2400 1800 1800				10.00 4.99 4.94
Total					**106.14**

It provides a storage volume of **106.14m^3**. Detailed design will be presented during site plan approval process.

4.2.2 Stormwater Tank

An area of 0.4757ha, comprised of the roof area, will be directed to the proposed stormwater tank.

The required storage volume is 244.74 – 106.14 = **138.60m^3**. Detailed storage requirements will be presented during site plan approval process. The stormwater tank is designed with a base area of 12.9m x 7.8m and a height of 1.4m. It provides a storage volume of **140.89m^3**. An emergency overflow will be provided at STM MH 1 in cases of outlet blockage or storm events in excess of the 100-yr storm event. Detailed design will be presented during site plan approval process.

4.3 Water Balance Consideration

The latest City of Mississauga Water Balance Management Plan contains a water balance target/criteria that requires the site to retain 5mm of every rainfall and allow it to infiltrate back into the ground or use for irrigation purposes.

The required volume for the proposed site is as follows:

V_{5mm} = 7,748m² x 0.005m = **38.74m³** per rainfall

The stormwater management tank will be extended 0.39m beneath the proposed outlet to provide storage for the required 5mm volume. Volume will be reused on-site for irrigation. Detailed design will be provided during the Site Plan Application process.

4.4 Quality Control

According to the Ministry of the Environment & Climate Change's Stormwater Management Planning & Design Manual, the site is required to provide a long-term average removal of 80% of Total Suspended Solids (TSS) for the enhanced protection of waterways. The quality control will be provided to Level 1 TSS removal through the use of an oil/grit separator.

Oil/Grit Separator (O.G.S.) is suitable for institutional/commercial/industrial areas where the level of concentrated pollutants is expected to be higher. For a new 8-storey apartment building, it is considered feasible to provide an O.G.S. on the proposed storm sewer.

The stormwater runoff from the paved area and landscaped area will be intercepted and conveyed through the O.G.S. prior to being released into the proposed storm sewer.

The proposed O.S.G. is Type DD1200 manufactured by Hydro International. This unit will provide Level 1 protection (93.0% TSS removal). Refer to ***Appendix B*** for the output file created by Hydro International spreadsheet.

4.5 Orifice Control

The allowable discharge to William Street will be controlled by means of an orifice plate installed downstream of STM MH 1. The size of the orifice plate is **110mm diameter**, with a discharge rate of **0.046 m^3/s**. Refer to ***Appendix C*** for the orifice control plate calculations done through Flow Master Program developed by Haestad Methods Inc. (USA).

5.0 SANITARY DRAINAGE SYSTEM

The proposed residential condominium development will be serviced to the existing 250mm dia. sanitary sewer on William Street. ***Refer to Dwg. No. 220-M108-1.*** A new proposed 200mm dia. sanitary sewer will be constructed along private condo road.

The existing sanitary sewer has sufficient capacity and depth to accept the proposed developments via gravity flow.

The sewage flows from the proposed development were established as follows:

Condominium Development

Proposed Development = 2.7 x 234 units
= 631.8 population
≈ **632** population

Peak Factor $= 1 + \frac{14}{4 + P^{0.5}}$

$= 1 + \frac{14}{4 + 0.632^{0.5}}$

= 1 + 2.92
= **3.92**

Expected Peak Flow = 302.8 x 632 x 3.92 (peak factor)
= 750,169 L/day = **8.68 L/s**

6.0 WATER DISTRIBUTION SYSTEM

The proposed common element development will be serviced to the existing 150mm watermain on William Street and looped to 300mm watermain on Queen Street South. The existing 300mm and 150mm watermain will provide sufficient water supply to service the development.
Refer to Dwg. No. 220-M108-1.

The proposed 150mm fireline will be constructed on William Street. Another connection will be constructed on Queen Street South, with one 200mm fireline and one 100mm water service. Each unit will be supplied with service internally. Any existing water services on Queen Street South will be removed and capped at main.

Water Demand Calculations

Proposed Development	= 632 population
Average Flow Rate	= 280 x 632 = 176,960 L/day = **2.05 L/s**
Max. Day Flow Rate	= 280 x 632 x 2.0 = 353,920 L/day = **4.10 L/s**
Peak Hour Flow Rate	= 280 x 632 x 3.0 = 530,880 L/day = **6.14 L/s**

Fire Hydrant Flow required based on Fire Underwriters Survey 1999 using formula:

F = 220 x C x √ x A

Where, C = coefficient related to type of construction, 0.6 for fire-resistive construtions
A = Area of the two largest adjoining floor + 50% of each floor immediately above them

F = 220 x 0.6 x √12,558
= 14,792 L/min ≈ **14,800 L/min**

A decrease can be applied for occupancy having a low contents fire hazard:

F = 14,800 L/min – 25% = **11,100 L/min**

The building is sprinklered, therefore a 30% reduction can be applied:

F = 11,100 L/min x 30% = **3,330 L/min**

The exposure separation for the north, east, west and south exterior walls cumulates to a charge of 40%:

F = 11,100 L/min x 40% = **4,440 L/min**

Therefore, the fire flow demand is:

F = 11,100 – 3,330 + 4,440
= 12,210 L/min = **203.5 L/s**

Maximum Peak Flow = 6.14 L/s + 203.5 L/s = **209.64 L/s**

Maximum Daily Flow = **4.10 L/s**

The fire flow conducted confirms that the existing system can provide sufficient fire protection and domestic flows. *Fire Flow results attached in **Appendix D**.*

7.0 SUMMARY

The findings and recommendations were prepared in accordance with accepted professional engineering principles and practices and reveal that the proposed development can be fully serviced to the existing available and proposed serviced on William Street and Queen Street South. These findings by no means are final and are not to replace the detail review of this application which shall take place upon submission of site plan or servicing agreement.

The conclusion is as follows:

- Stormwater quantity control for the site will be achieved by the use of stormwater tank and oversized storm sewers. Quality control for the site will be provided through the use of an oil/grit separator. Connection to be provided to William Street 450mm storm and Queen Street South 375mm storm.
- The proposed development will be serviced via internal sanitary sewer. The existing 250mm sanitary sewer on William Street has sufficient capacity and depth to accept the proposed development via gravity flow.
- The 150mm watermain on William Street and 300mm watermain on Queen Street South will provide adequate pressure and flow for domestic use and fire protection.

We respectively submit this report with intention of obtaining approval in principal the recommendations herein, which will be implemented in detail design during engineering submission, site plan process and building permits.

Yours truly,

SKIRA & ASSOCIATES LTD.

Michael Jozwik, P. Eng.
MJ:dw

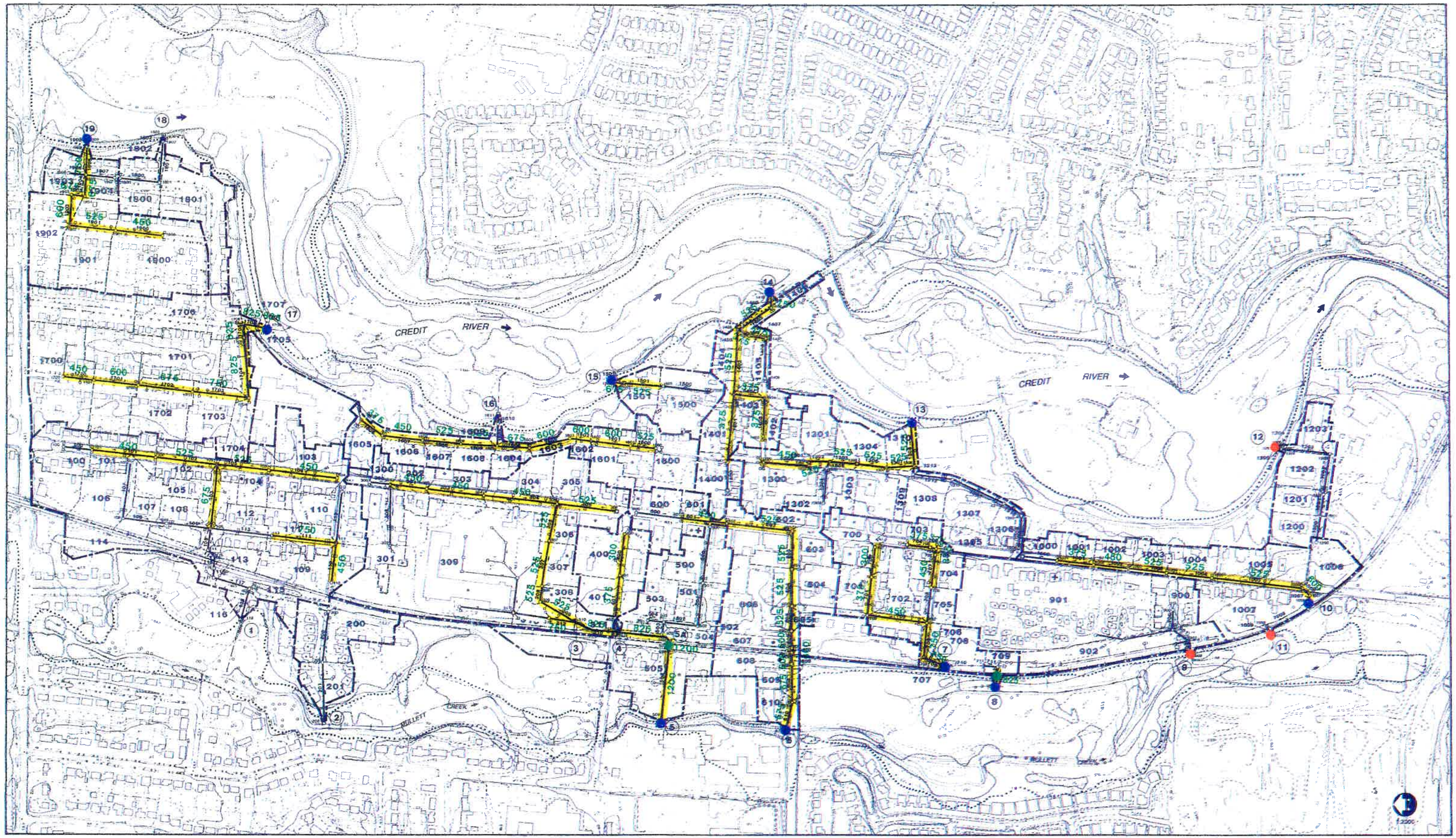
NOTE: ***Limitation of Report***

*This report was prepared by **Skira & Associates Ltd.** for **City Park (Camilla) Homes** for review and approval by government agencies only.*

*In light of the information available at the time of preparation of this report, any use by a **Third Party** of this report are solely the responsibility of such **Third Party** and **Skira & Associates Ltd.** accepts no responsibility for any damages, if any, suffered by the **Third Party**.*

Appendix A

Dillion Streetsville Area Drainage
Storm Sewer Design Sheets & Figures



REPAIR TO OUTFALL
NEW OUTFALL
NEW CULVERT
300 REPLACEMENT PIPE SIZE

LEGEND

STORM SEWER
100 CONDUIT NUMBER
MANHOLE, MANHOLE/CATCHBASIN
MANHOLE NUMBER
CATCHBASIN
DIRECTION OF MINOR SYSTEM FLOW
OPEN DITCH/CHANNEL
CATCHMENT AREA
SUBCATCHMENT AREA
100 SUBCATCHMENT NUMBER
STORM SEWER OUTFALL
(1) OUTFALL NUMBER
REGULATORY FLOODLINE
CULVERT
BUILDING(S) WITH ROOF LEADER DOWNSPOUTS
LOCATION OF REPORTED BUILDING FLOODING (1974)
BUILDING SITES EMPLOYING STORM WATER MANAGEMENT

DILLON Consulting Engineers / Planners

STREETSVILLE AREA DRAINAGE STUDY

ALTERNATIVE 2: REPLACEMENT OF UNDERSIZED SEWERS TO 10-YEAR DESIGN STANDARD

FIGURE 8

TABLE II-A
SUMMARY OF RATIONAL METHOD STORM SEWER DESIGN CALCULATIONS

STREET	DRAINAGE AREA INFORMATION							TIME OF CONCENTRATIONS						STORM SEWER PIPE INFORMATION										
	FROM UPSTM MH	TO DNSTM MH	AREA ID	DRAINAGE AREA Aa (ha)	PERCENT IMPERV Imp (%)	RUNOFF COEFF. Ca	AREA x C AaxCa	CUMML AREA At (ha)	CUMML AxC AtxCt	INLET TIME TCi (min)	FLOW TIME TCf (min)	TOTAL TIME TCt (min)	RAINFALL INTENSITY I (mm/hr)	TOTAL RUNOFF Qr (m3/s)	MATERIAL	MANNING n	SLOPE So (m/m)	DIAMETER D (mm)	LENGTH L (m)	FULL FLOW VELOCITY Vf (m/s)	FULL FLOW CAPACITY Qf (m3/s)	UPSTM INVERT (m)	DNSTM INVERT (m)	FLOW TIME TCf (min)	FLOW/PIPE CAPACITY (Qr/Qf)
Outfall No 1																									
Queen Street	To	100		-	-	-	-	-	-	15.00	-	15.00													
Queen Street	100	101	100	0.65	30	0.41	0.27	0.65	0.27	15.00	-	15.00	99.2	0.073	conc.	0.013	0.0030	375	46.3	0.873	0.096	164.29	164.15	0.88	0.76
Queen Street	101	102	101	0.62	43	0.50	0.31	1.27	0.58	15.00	0.88	15.88	95.8	0.153	conc.	0.013	0.0030	375	100.6	0.867	0.096	164.15	163.85	1.93	1.60
Queen Street	102	103	102	0.58	59	0.61	0.36	1.85	0.93	15.88	1.93	17.82	89.3	0.231	conc.	0.013	0.0032	375	99.1	0.902	0.100	163.85	163.53	1.83	2.32
Queen Street	To	104		-	-	-	-	-	-	15.00	-	15.00													
Queen Street	104	105	103	1.20	63	0.64	0.77	1.20	0.77	15.00	-	15.00	99.2	0.213	conc.	0.013	0.0030	375	109.0	0.873	0.096	163.25	162.92	2.08	2.20
Queen Street	105	103	104	0.58	37	0.46	0.26	1.78	1.04	15.00	2.08	17.08	91.7	0.264	conc.	0.013	0.0024	375	83.0	0.779	0.086	162.90	162.70	1.78	3.07
Henry Street	103	106	105	0.76	39	0.47	0.36	4.38	2.32	17.82	1.83	19.65	84.0	0.542	conc.	0.013	0.0045	600	101.0	1.450	0.410	162.64	162.19	1.16	1.32
James Street	To	107		-	-	-	-	-	-	15.00	-	15.00													
James Street	107	108	106	0.74	23	0.36	0.27	0.74	0.27	15.00	-	15.00	99.2	0.074	conc.	0.013	0.0050	375	90.0	1.123	0.124	164.53	164.08	1.34	0.60
William Street	108	109	107	0.32	64	0.65	0.21	1.06	0.48	15.00	1.34	16.34	94.2	0.125	conc.	0.013	0.0151	450	71.0	2.201	0.350	164.00	162.93	0.54	0.36
William Street	109	106	108	0.51	91	0.84	0.43	1.57	0.90	16.34	0.54	16.87	92.3	0.231	conc.	0.013	0.0150	525	72.0	2.433	0.527	162.85	161.77	0.49	0.44
Ontario Street	To	110		-	-	-	-	-	-	15.00	-	15.00													
Ontario Street	110	111	109	0.86	25	0.38	0.32	0.86	0.32	15.00	-	15.00	99.2	0.089	conc.	0.013	0.0050	300	60.0	0.967	0.068	162.60	162.30	1.03	1.30
Ontario Street	To	112		-	-	-	-	-	-	15.00	-	15.00													
Ontario Street	112	111	110	0.85	24	0.37	0.31	0.85	0.31	15.00	-	15.00	99.2	0.086	conc.	0.013	0.0051	375	85.0	1.129	0.125	162.73	162.30	1.25	0.69
William Street	111	113	111	0.63	50	0.55	0.35	2.33	0.98	15.00	1.25	16.25	94.5	0.257	conc.	0.013	0.0030	675	103.0	1.289	0.461	162.30	161.99	1.33	0.56
William Street	113	106	112	0.52	46	0.52	0.27	2.86	1.25	17.08	1.33	18.41	87.5	0.304	conc.	0.013	0.0030	750	99.5	1.384	0.611	161.92	161.62	1.20	0.50
Easement	106	114		-	-	-	-	8.81	4.48	19.65	1.16	20.81	81.0	1.007	conc.	0.013	0.0100	900	35.0	2.846	1.810	161.53	161.18	0.20	0.56
Easement	114	115	113	0.40	4	0.23	0.09	9.21	4.57	20.81	0.20	21.02	80.5	1.022	conc.	0.013	0.0104	900	13.5	2.898	1.844	161.13	160.99	0.08	0.55
Easement	115	116		-	-	-	-	9.21	4.57	21.02	0.08	21.09	80.3	1.019	conc.	0.013	0.0100	900	21.0	2.846	1.810	160.99	160.78	0.12	0.56
Easement	116	117	114	0.78	1	0.21	0.16	9.99	4.73	21.09	0.12	21.22	80.0	1.051	conc.	0.013	0.0100	900	15.0	2.846	1.810	160.05	159.90	0.09	0.58
Easement	117	118	115	0.67	16	0.31	0.21	10.66	4.94	21.22	0.09	21.30	79.8	1.095	conc.	0.013	0.0100	900	58.0	2.846	1.810	159.75	159.17	0.34	0.60
Easement	118	119	116	0.14	9	0.26	0.04	10.81	4.98	21.30	0.34	21.64	79.0	1.092	conc.	0.013	0.0100	900	55.0	2.846	1.810	158.65	158.10	0.32	0.60
		TOTAL		10.81			4.98																		

Appendix B

Oil/Grit Interceptor Calculations

Hydro International - Stormwater Quality Treatment Flow Design

Turning Water Around...®

Project Details:

Project Name:	220-M108	***Designer:***	D.W.
Street:	2 WILLIAM STREET	***Company:***	Skira & Associates Ltd.
City:	Mississauga	***Office:***	
State:		***email:***	
Post Code:		***Phone:***	
County:		***Report Date:***	#########

Treatment Parameters:

TSS Treatment Goal:	80%	***Peak Flow at Unit (L/s):***	48.49
TSS Particle Size:	110 µm	***Return / Storm Probablilty (yrs):***	100
Flow Treated (L/s):	48.49		

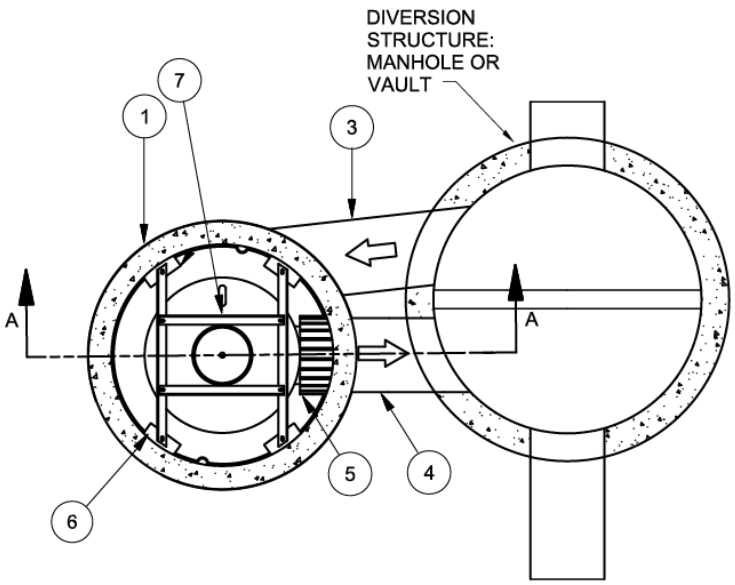
Treatment Unit Performance Statement:

The Hydro International stormwater treatment system, model DD1200, achieves the water quality objective removing 76.9% TSS using 110 µm particle size distribution, providing continuous treatment positive removal for the water quality flow of 48.49 L/s.

Treatment Unit Specification:

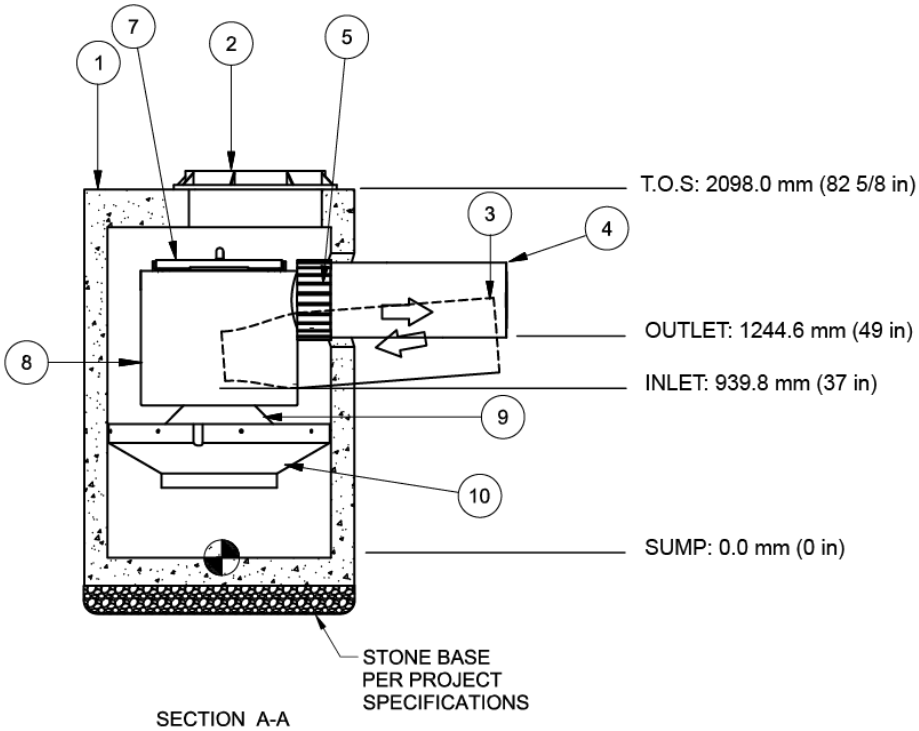
Model:	DD1200	
Diameter (mm):	1200	
Treatment Flow (L/s):	113.32	(Prior to any bypass flow)
Peak Flow Capacity (L/s):	113.32	
Sediment Storage Capacity(L):	534	
Oil Storeage Capacity (L):	265	

Designer Notes:



Parts List

ITEM	DESCRIPTION	SIZE
1	PRECAST MANHOLE (BY HYDRO VIA PRECASTER)	1219 mm
2	FRAME AND COVER	762 mm
3	INLET PIPE (BY OTHERS)	305 mm
4	OUTLET PIPE (BY OTHERS)	305 mm
5	PIPE COUPLING (BY OTHERS)	
6	LEDGER ANGLE	
7	SUPPORT FRAME	
8	DIP PLATE	
9	CENTER SHAFT AND CONE	
10	BENCHING SKIRT	



SECTION A-A

Pipe Connections		Invert Levels
Outlet Pipe:	450 mm	0.000 m
Inlet Pipe 1 Size:	975 mm	0.000 m
Inlet Pipe 2 Size:	0 mm	0.000 m

Unit Specifcation

Diameter:	1200 mm
Treatment Capacity:	113.32 L/s
Max Headloss:	0.207 m
Sediment Storage:	534 L
Oil Storage:	265 L

Notes

1. NOT FOR CONSTRUCTION OR FABRICATION PURPOSES.
2. NUMBER OF PIPES MAY DIFFER FROM DRAWING.
3. PIPE ANGLES MAY DIFFER FROM DRAWING.
4. DRAWING DIMENSIONS ARE BASED ON STANDARD DETAILS. LEVELS INDICATED MUST BE CONFIRMED ON SUBMITTAL DRAWINGS.
5. USE 300 to 450 MATCHED INVERT ADAPTOR TO CONNECT OUTLET STUB TO PIPE.

REVISION HISTORY

REV	BY	DATE	DESCRIPTION

Date	Scale
	NTS

Drawn	Checked	Approved

Title

DOWNSTREAM DEFENDER
1200 mm (4-FT) DIAMETER

STANDARD OFFLINE DETAIL

Project Name:
220-M108

2 WILLIAM STREET

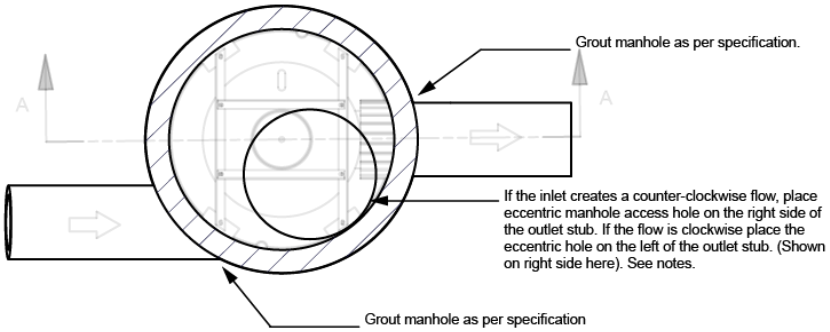
Mississauga

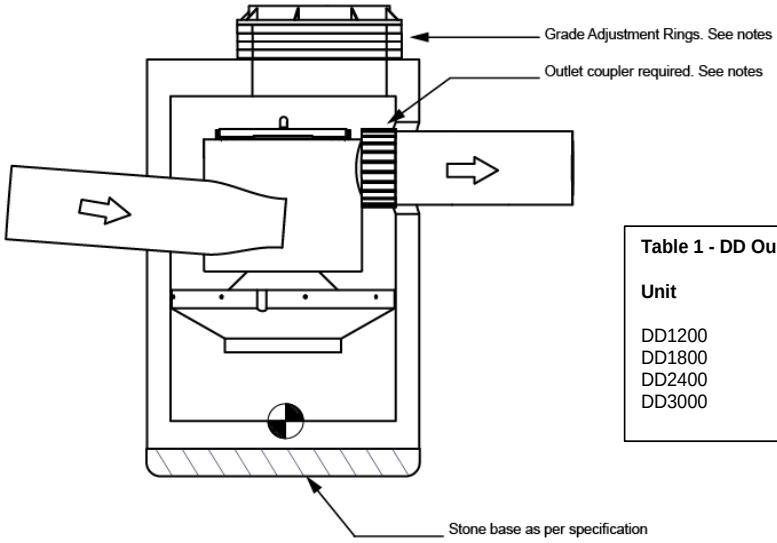
Hydro International
stormwater
94 Hutchins Drive
Portland, Maine 04102
Tel: (207) 756-6200
Fax: (207) 756-6212
www.hydro-int.com/us

CAD Ref:

Project No.

Drawing No. Rev.





SECTION A-A

Table 1 - DD Oulet Stub Size

Unit	OD of Stub
DD1200	318 mm
DD1800	475 mm
DD2400	630 mm
DD3000	914 mm

Notes:

1. Grade adjustment rings are not supplied with the structure. Refer to submittal drawings for casting sizes.
2. Outlet coupler can be a sleeve or wrap style. Refer to Table 1 for stub size.
3. Outlet stub is not adjustable. Any adaptors from stub to outlet pipe must be invert matched.
4. Pipe adaptors must be used outside the the manhole.
5. Inlet pipe size must not exceed outlet pipe size.
6. Unless otherwise specified use Hydro standrd castings supplied with unit.
7. -

Notes

REVISION HISTORY			
REV	BY	DATE	DESCRIPTION

Date	Scale
	NTS

Drawn	Checked	Approved

Title
DOWNSTREAM DEFENDER

STANDARD NOTES

Project Name:

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Appendix C

Orifice Control Calculations
Flow Master Output

SKIRA & ASSOCIATES LTD.
CONSULTING ENGINEERS

WORKSHEET
for Circular Orifice

Project Description	
Worksheet	Orifice - 1
Type	Circular Orifice
Solve For	Diameter

Input Data		
Discharge	0.046	m^3/s
Headwater Elevation	166.20	m
Centroid Elevation	164.33	m
Tailwater Elevation	164.10	m
Discharge Coefficient	0.80	

Results		
Diameter	110	mm
Headwater Height Above	1.88	m
Tailwater Height Above	0.22	m
Flow Area	9.50E-03	m^2
Velocity	6.07	m/s

Appendix D

Water Supply Test
by Applied Fire Technology Inc.