DILLON CONSULTING

MONTGOMERY SISAM ARCHITECTS INC.

Orleans Long Term Care Facility Functional Servicing Report

City of Ottawa

November 2021 – 21-2647

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Appendices

1.0 Introduction

Dillon Consulting Limited (Dillon) was retained by Montgomery Sisam Architects Inc. to develop a functional servicing strategy for the undeveloped property fronting Famille-Laporte Avenue, located at 1161 Old Montreal Road in the City of Ottawa. This document outlines the servicing strategy including supporting studies and related information for the transportation, sanitary, stormwater management, and water main servicing for the site.

The total area of the entire site is approximately 2.01 Ha. The Developer is planning on severing the property into two separate development lots. The proposed Long Term Care development site is approximately 1.22 Ha, and the remaining undeveloped lands area are approximately 0.79 Ha. The overall site is presently zoned RI5 Rural Institutional and currently consists of a vacant/grassed field. The proposed Long Term Care Facility development will be located on the southern portion of the site within the limits of the vacant field.

1.1 Reference Documents

The following documents and drawings were referenced when completing this study:

- City of Ottawa– Sewer Design Guidelines (Ottawa, 2012)
- City of Ottawa – GIS Interactive Mapping (Ottawa)
- Design Guidelines for Sewage Works (MOE, 2008)

2.0 Transportation Servicing

2.1 Existing Conditions

There is no existing access to the proposed development. The property is bounded on the north limit, east limit, and south limit by residential homes.

2.2 Proposed Roadways

The proposed access points to this development will be from Famille-Laporte Avenue at the west limit of the site. Staff, visitors, EMS, services and deliveries will access the site via Famille-Laporte Avenue. The site layout is shown in *Appendix A*. The pavement structure of the proposed internal roads will be consistent with geotechnical recommendations and the City's Development Manual. A Traffic Impact Study (TIS) is required for this project and is currently underway.

3.0 Sanitary Servicing

3.1 Existing Conditions

Currently, there is an existing 200 mm diameter sanitary sewer located underneath Famille-Laporte Avenue, which is located west of the proposed development. The existing sanitary sewer heads northwards, ultimately discharges to the City of Ottawa Robert O. Pickard Environmental Centre treatment plant.

3.2 Design Criteria

The following sanitary sewer design criteria for this property are outlined in Table 1. The design criteria was established by the City of Ottawa's Design Guidelines (2012).

Table 1: Sanitary Sewer Design Criteria

Criteria	City of Ottawa's Design Guidelines (2012)
Hydraulic Sewer Sizing	Manning's Equation
Minimum Sewer Size (mm)	135 mm diameter
Minimum Cover Depth (m)	2.0
Manning's Roughness Coefficient 'n'	0.013
Velocity: Minimum (m/s) Maximum (m/s)	 0.60 3.00
Hydraulic Losses Across Manholes: • Straight Run (m) • 45 degree turn of less (m) • Greater than 45 degree turn to 90 degree turn (m)	 Grade of Sewer 0.03 0.06
Infiltration Allowance/Peak Extraneous Flow	0.28 L/Ha/s
Peaking Factor	Based on Harmon Formula
Population Densities For Facility:	224 Bed Facility Assumed 30 Staff Members Total Population = 254 ppl
Average Daily Sewage	50,000 L/Gross Ha/Day [Per City Sewer Guidelines for Institutional Lands] 350 L/Cap/Day [Residential Average Flow]
Sewer Surcharging	Maximum hydraulic grade line

3.3 Proposed Servicing

Refer to the attached *Appendix A* which illustrates the proposed sanitary servicing layout. The sanitary servicing for the proposed development is as follows:

- All sanitary flows from within the proposed development will be conveyed via local sanitary sewers.
- It is proposed that the local sanitary sewer will outlet to the existing Private Drain Connection Manhole located at the Famille-Laporte Avenue right-of-way limit. The existing PDC sewer is 200mm in diameter, connects to an existing sanitary manhole within the Famille-Laporte right-of-way, and drains northerly via an existing 250mm diameter sewer.

The sanitary sewer functional design sheets are provided in *Appendix B*. Criteria used in flow calculation is listed in Table 1.

The future detailed design of the sanitary sewer and service is to be consistent with the requirements of the City of Ottawa and the Ministry of Environment, Conservation and Parks (MECP).

4.0 Stormwater Servicing

4.1 Background Information

The proposed development is of approximately 1.21 Ha and is zoned RI5 Rural Institutional, currently consists of a vacant field. The City of Ottawa has previously installed a storm sewer stub for the proposed development at this location. There is an existing 1200 mm diameter municipal storm sewer within the Famille-Laporte Avenue right-of-way along east side of the road heading northwards, which outlets to the Ruisseau Cardinal Creek and ultimately discharges to the Ottawa River.

4.2 Design Criteria

The following storm sewer design criteria for this property are outlined in Table 2. The design criteria were established by the City of Ottawa's Design Guidelines (2012).

Table 2: Storm Sewer Design Criteria

Criteria	City of Ottawa's Design Guidelines (2012)
Hydraulic Sewer Sizing	Rational Method / Mannings Equation
Sewer Sizing Rainfall Event	5 year storm event
Minimum Cover Depth (m)	2
Manning's Roughness Coefficient 'n'	0.013
Velocity: • Minimum (m/s) • Maximum (m/s)	 0.80 3.0
Roof Downspouts	May be connected directly to underground sewer system network or directed to surface
Rooftop Storage	Permitted (maximum 0.3m depth)
Inlet Times: • Institutional	 15 minute maximum
Runoff Coefficients: • Paved and Roof Surfaces • Landscaped/Open Space	Calculated per Site Conditions 0.90 0.20
Sewer Surcharging	• No surface ponding during 5 year storm event • 100 year Hydraulic Grade Line 0.3m below building footing
Stormwater Storage Requirements	• Storage of 100 year storm event • Outlet rate to be confirmed through consultation with City

Criteria	City of Ottawa's Design Guidelines (2012)
Water Quality Treatment	Required per Rideau Valley Conservation Authority (RVCA)

4.3 Proposed Servicing

It is proposed that the site's stormwater outlet to the existing 1200 mm diameter storm sewer that is currently located within the Famille-Laporte Avenue right-of-way, located west of the site.

Refer to *Appendix A* for the proposed servicing. The stormwater servicing for the proposed development is as follows:

- The proposed site, and paved area will be serviced through a new storm sewer network constructed within the site.
- Onsite detention will be provided in accordance with City of Ottawa and Rideau Valley Conservation Authority Design Guidelines. Pre-consultation with the City is required, but in general the site storm outlet rate is to be restricted to the pre-development outlet rates for the 2, 5 and 100 year storm events.
- The site will be graded to allow for overland flow to be captured onsite and directed to the storm sewer network. Rain events in excess of the 100 year event will spill over the site entrances and drain overland within the existing City road network.

Refer to *Appendix B* for the sanitary sewer and storm sewer design and *Appendix C* for the Stormwater Management Calculations.

5.0 Watermain Servicing

5.1 Existing Conditions

An existing 400 mm diameter watermain is located within the Famille-Laporte Avenue right-of-way, located in the west boulevard. The site currently does not have any service connections.

5.2 Proposed Servicing

Please refer to the attached *Appendix A* which illustrates the proposed watermain servicing. The watermain servicing for the proposed development is as follows:

- The new building will be serviced by a new 150 mm diameter domestic watermain connected to the existing main on Famille-Laporte Avenue. The building service lines are split prior to entering the building into a 100mm diameter domestic service, and a 150mm diameter fire service. A backflow preventer will be installed inside the building mechanical room.
- Two (2) new fire hydrants and 150 mm diameter leads are proposed for the site. One is located in the south parking area to be in close proximity to the building FDC connection, the second is located in the north boulevard. Both fire hydrants will be connected to the existing main on Famille-Laporte Avenue.
- All water crossings of Famille-Laporte Avenue will be completed via directional drill, with no open cuts to the roadway.

Fire hydrant flow testing has been completed for this development. Refer to *Appendix D* for the fire hydrant flow testing result.

The detailed design of the watermain service are to be consistent with the requirements of the City of Ottawa and will be coordinated during the detailed design process.

6.0 Utilities

6.1 Gas

Existing natural gas infrastructure is located along the Famille-Laporte Avenue right-of-way, located west of the site. There is no existing natural gas service currently servicing the proposed site. During detailed design, future conversation on loading will be required with Enbridge.

6.2 Telecommunications

The existing site is not currently serviced by telecommunications. It is anticipated that existing telecommunications infrastructure exists within the Famille-Laporte Avenue right-of-way, located west of the site. Detailed design, additional consultation will be held with utility owner to confirm internal servicing requirements.

6.3 Hydro

Existing hydro infrastructure is buried along the east side of the Famille-Laporte Avenue right-of-way. There is no existing hydro currently servicing the proposed site. During detailed design, future conversation on loading will be required with the hydro provider.

7.0 Conclusion

The review of the adjacent services have been found to be sufficient for the proposed development. The design of the proposed internal services will be finalized during detailed design.

Yours sincerely,

DILLON CONSULTING LIMITED

Chris Patten, P.Eng.
Project Manager

Appendix A

Functional Servicing Plan

PROPOSED 4 STOREY LONG TERM CARE
FFE= 67.50

LANDSCAPE BUFFER

NEW PROPERTY LINE

ORIGINAL PROPERTY LINE

TERRACE

FACILITY WIDE COURTYARD

RHA COURTYARD

LOADING SPACE

LOADING SPACE

DROP-OFF LAYBY

EXIT

INTERNAL STAIRS REQUIRED

200mm DIA. FIRE LINE

150mm DIA. Y DOMESTIC

200mm DIA. PDC SANITARY SEWER AT 0.50%

SETBACK LINE (FRONT YARD)

LANDSCAPED AREA

WQU UNIT

LANDSCAPE BUFFER

SETBACK LINE (SIDE YARD)

PROPERTY LINE

FIRE ROUTE

ENTRY/EXIT

CONCRETE SIDEWALK

GRASS BOULEVARD

EDGE OF PAVEMENT

FAMILLE-LAPORTE AVENUE

CROWN OF ROAD

Concrete Sidewalk

Grass Boulevard

Top of Curb

Edge of Pavement

Crown of Road

150mm DIA.

200mm DIA.

1500mm DIA.

250mm DIA. SAN

200mm DIA. SAN

1200mm DIA.

STORM PDC

SAN PDC

CONNECTION TO EXISTING WATERMAIN

CONNECTION TO EXISTING MANHOLE INV = 61.39

CONNECTION TO EXISTING WATERMAIN

CONNECTION TO EXISTING WATERMAIN

SITE BENCHMARK 'B'
T/S FIRE HYDRANT
ELEV.=67.83m

SITE BENCHMARK 'C'
T/S FIRE HYDRANT
ELEV.=68.29m

NOTE:
FINAL GRADING AND ALL SITE SERVICING TO BE FINALIZED ONCE SITE PLAN IS CONFIRMED.

ARCH CORP ORLEANS
1161 Old Montreal Road, Ottawa, ON

SITE SERVICING PLAN
FIGURE 1.0

SUBJECT SITE (±1.66ha/±4.10ac)

FUTURE BUILDING

WATERMAIN

SANITARY SEWER

STORM SEWER

File Location:
c:\pw working directory\projects 2021\32cdp\dms62260\archcorp_orleans_fsr.dwg
November, 10, 2021 4:52 PM

MAP/DRAWING INFORMATION
THIS DRAWING IS FOR INFORMATION PURPOSES ONLY. ALL DIMENSIONS AND BOUNDARY INFORMATION SHOULD BE VERIFIED BY AN O.L.S PRIOR TO CONSTRUCTION.
CREATED BY: KRK
CHECKED BY: CDP
DESIGNED BY: KRK

SCALE: 1:1000

PROJECT: 21-XXXX
STATUS: DRAFT
DATE: 08/27/2021

Appendix B

Sanitary Sewer and Storm Sewer Design Sheets

ORLEANS LONG TERM CARE FACILITY - CITY OF OTTAWA
SANITARY SEWER DESIGN SHEET

Project Name: Orleans LTC
Project No: 21-4926

City of Ottawa

The Peaking Factor was derived:
Using Harmon Formula= Y (Y or N)
From a Table= N
Value from table=

Residential Average Daily Flow= 350 L/Cap.D
Peak Extraneous Flow= 0.280 L/Ha.S

Outlet Invert Elevation= 60.740
Mannings 'n'= 0.013
Total Area= 1.220

Basement Floor Elevation = 0.000
or
Hydraulic Grade Line Cover = 2.00

Ground Elevation at Outlet = 66.790
HGL at Outlet = 61.590

Location			Flow Characteristics								Sewer Design/Profile										Cover			Hydraulic Grade Line		
ROAD/STN	LOCATION FROM MH	LOCATION TO MH	INDIVIDUAL POP	INDIVIDUAL AREA (ha.)	CUMULATIVE POP	CUMULATIVE AREA (ha.)	PEAKING FACTOR M	POP FLOW Q(p) (L/s)	PEAK EXTR. FLOW Q(i) (L/s)	PEAK DESIGN FLOW Q(d) (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE DIA. (mm)	Wall Thickness (mm)	SLOPE (%)	UPPER INVERT (m)	LOWER INVERT (m)	FALL (m)	VELOCITY (m/s)	DROP IN LOWER MANHOLE (m)	Ground Elevation Upper MH	Cover @ Up MH (m)	Cover @ Low MH (m)	HGL Elev at Upstream MH	HGL Elev vs. Grnd Elev @ Up MH	HGL Elev vs. Obvert @ Up MH
LTC	BLDG	EX MH	254.0	1.22	254	1.22	4.108	4.227	0.342	**4.57**	**23.19**	7.2	200	15	0.50	63.341	63.305	0.036	0.74	0.025	67.450	3.894	3.660	61.598	OKAY	
Fam. Laporte	EX MH	MAIN	0.0	0.00	254	1.22	4.108	4.227	0.342	**4.57**	**92.77**	16.9	200	15	8.00	63.280	61.928	1.352	2.95	0.538	67.180	3.685	4.647	61.597	OKAY	

Dillon Consulting Ltd.

ORLEANS LTCF
STORM SEWER DESIGN SHEET

Project Name: Orleans LTCF
Project Number: 21-2647

Based on 1:100 Year Storm Event
City of Ottawa

Intensity Option # 1

1) Intensity (i) = a/(t+b)^c
a= 1735.700
b= 6.014
c= 0.820

2) Intensity (i) = a*t^b
a=
b=

3) Insert Intensity
i=

Manning's n = 0.013

Total Area (ha)= 1.21 Outlet Invert Elevation= 65.520 Ground Elevation @ Outlet = 67.25 High Water Level at Outlet=

Location			Sewer Design / Profile																Cover			Hydraulic Grade Line	
Road /Stations	From MH	To MH	Area (ha)	Run. Coef.	2.78AC	Accum. 2.78AC	T of In (min)	T of F (min)	T of Conc. (min)	Intensity (mm/hr)	Exp. Flow (L/s)	Capacity (L/s)	Velocity (m/s)	Wall Thickness (mm)	Length (m)	Pipe Dia. (mm)	Slope (%)	Invert Up MH	Invert Low MH	Fall (m)	Drop Across Low MH (m)	Ground Elev Up MH	Cover @ Up MH (m)	Cover @ Low MH (m)	HGL Elevation at Upstream MH	HGL Elev vs. Grnd Elev @ Up MH
	MH1	MH2	0.04	0.82	0.08	0.08	10.0	0.40	10.00	178.56	**14.25**	**162.54**	1.02	11	24.6	450	0.33	65.94	65.86	0.08		67.150	0.75	1.08	66.39	Okay
	MH2	MH3	0.08	0.82	0.18	0.26	10.0	0.66	10.40	174.97	**45.87**	**161.28**	1.01	11	40.0	450	0.32	65.86	65.73	0.13	0.040	67.400	1.08	1.11	66.31	Okay
	MH3	STORAGE	0.10	0.82	0.23	0.49	10.0	0.03	11.06	169.43	**82.65**	**201.60**	1.27	100	2.5	450	0.50	65.69	65.68	0.01		67.300	1.06	1.27	66.14	Okay
	STORAGE	MH4	0.10	0.82	0.23	0.72	10.0	0.07	11.09	169.16	**121.09**	**127.50**	0.80	100	3.3	450	0.20	65.68	65.67	0.01		67.500	1.27	1.20	66.13	Okay
	MH4	WQU	0.00	0.82		0.72	10.0	1.31	11.16	168.61	**120.69**	**127.50**	0.80	100	63.1	450	0.20	65.67	65.54	0.13		67.420	1.20	1.36	66.12	Okay
	WQU	OUTLET	0.00	0.82		0.72	10.0	0.23	12.47	158.73	**113.62**	**127.50**	0.80	100	11.3	450	0.20	65.54	65.52	0.02		67.450	1.36	1.18	65.99	Okay
	CBMH5	MH6	0.26	0.82	0.59	0.59	10.0	0.89	10.00	178.56	**105.83**	**161.28**	1.01	100	54.1	450	0.32	65.92	65.75	0.17	0.060	67.000	0.53	1.12	66.37	Okay
	MH6	STORAGE	0.00	0.82	0.00	0.59	10.0	0.08	10.89	170.82	**101.28**	**161.28**	1.01	100	4.7	450	0.32	65.69	65.68	0.02		67.420	1.18	1.27	66.14	Okay
	CBMH7	MH8	0.11	0.82	0.25	0.25	10.0	0.45	10.00	178.56	**44.78**	**54.70**	0.77	11	20.8	300	0.32	65.75	65.69	0.07		66.300	65.92	-0.31	0.37	Okay
	MH8	MH9	0.05	0.82	0.10	0.35	10.0	1.38	10.00	178.56	**62.50**	**127.50**	0.80	100	66.5	450	0.20	65.69	65.56	0.13		66.600	65.92	-0.55	0.58	Okay
	MH9	OUTLET	0.05	0.82	0.11	0.48	10.0	0.39	12.71	157.10	**75.41**	**127.50**	0.80	100	18.7	450	0.20	65.56	65.52	0.04		67.300	1.19	1.18	66.01	Okay
	BLDG	STORAGE	0.43	0.82	0.97	0.97	10.0	0.17	10.00	178.56	**172.99**	**46.38**	1.48	11	15.0	200	2.00	65.975	65.675	0.30		67.500	1.31	1.61	70.30	From Mech. Engineer

Appendix C

Stormwater Management Report

DILLON CONSULTING	Stormwater Management Calculations	Project:	Perth LTCF	No.:	212317	
	Rational Method Calculations	By:	SZ	Date:	11/19/2021	Page:
		Checked:	JVM	Scenario:	Existing	1

Calculation of existing runoff rate is undertaken using the Rational Method: **Q = CIA / 360**

Where: Q = Peak flow rate (litres/second)
C = Runoff coefficient
I = Rainfall intensity (mm/hour)
A = Catchment area (hectares)

			Agg Maps
Project Area, A	**1.22** hectares	Soil type	**Silty Clay**	**D**

Composite Runoff Coefficient		
Land Use	Area (m^2)	C
Existing Site	12,232	0.35
Composite Runoff Coefficient	12,232	0.35

Time of Concentration							
Method	Up EL (m)	Down EL (m)	Length (m)	Slope (%)	Area (ha)	C	Min Inlet Time (min)
	69.5	66.25	140	2.32	1.22	0.35	10
Bransby Williams						t_c (min) =	N/A
Airport						t_c (min) =	21.9

Rainfall intensity calculated in accordance with Sault Ste. Marie IDF Parameters:
(if only two paramters are provided, enter B as "0" and C as positive number)

$$I = \frac{A}{(B + t_c)^C}$$

Where: A, B, and C = IDF Parameters From Local Municipality Guidelines
I = Rainfall intensity (mm/hour)
T = Time of concentration (hours)

Return Period (Years)	2	5	10	25	50	100
A	732.951	998.071	1174.184	1402.884	1569.580	1735.688
B	6.199	6.053	6.014	6.018	6.014	6.014
C	0.810	0.814	0.816	0.819	0.820	0.820
T (mins) **	21.9	21.9	21.9	21.9	21.9	21.9
I (mm/hr)	49.1	66.3	77.6	91.8	102.3	113.2
Q (L/s)	**58.5**	**78.9**	**92.3**	**109.2**	**121.8**	**134.7**
Q (m_3/s)	0.058	0.079	0.092	0.109	0.122	0.135

ORIFICE PLATE SIZING CALCULATION

Orifice Coeficient (C) =	0.62	
Allowable Outflow (Q) =	2.05	cfs
Invert =	215.45	
100 Year HWL =	217.95	
Trial D =	0.600	feet
Head (h) =	2.2	
Actual D =	0.595	feet
Actual D =	7 4/32	inches
USE A	**7.14**	**INCH ORIFICE**
	181.3	**mm**

DILLON CONSULTING	Stormwater Management Calculations	Project:	Orleans LTCF	No.:	21-2647	
	Storage Calculations	By:	SZ	Date:	11/19/2021	Page:
		Checked:	JVM	Scenario:	Proposed	2

Calculation of existing runoff rate is undertaken using the Rational Method: **Q = CIA / 360**

Where: Q = Peak flow rate (litres/second)
C = Runoff coefficient
I = Rainfall intensity (mm/hour)
A = Catchment area (hectares)

Project Area, A **1.22** hectares

Composite Runoff Coefficient		
Land Use	Area (m^2)	C
Building	3,034	0.90
Asphalt Pavement	4,630	0.90
Rocks, Misc Landscape	1,211	0.80
Grass	3,357	0.25
Composite Runoff Coefficient	12,232	0.71

Runoff Coefficient Adjustment:	25%
Design Runoff Coefficient:	0.89

Target Discharge (m^3/s):	0.058

Design Event

100-Year Storm - From Ottawa SWM Guidelines 2012

A =	1735.7
B =	6.014
C =	0.820
Time Step =	5 min

(if only two paramters are provided, enter B as "0" and C as positive number)

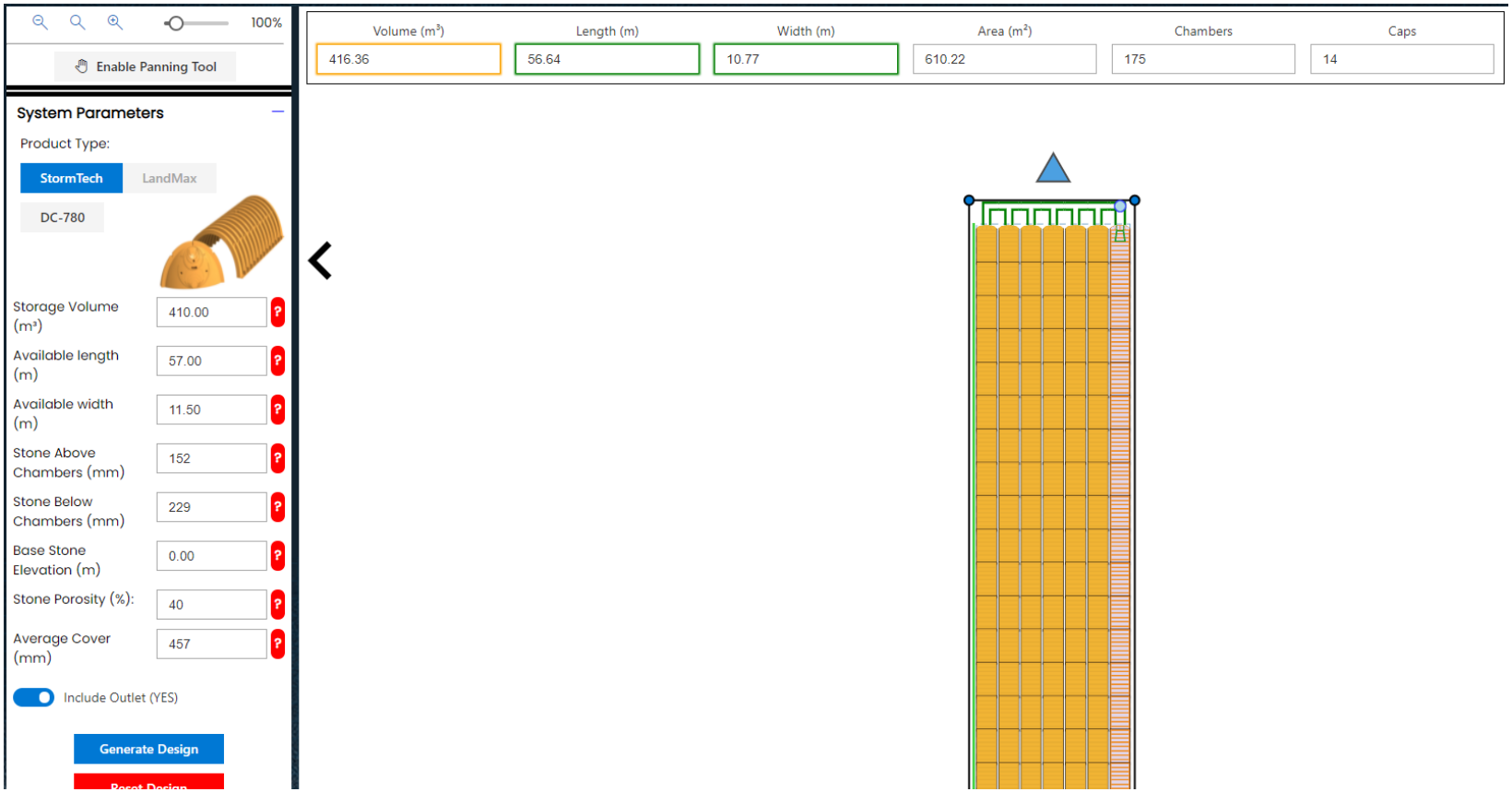
$$I = \frac{A}{(B + t_c)^C}$$

Where: A, B, and C = IDF Parameters From MTO
I = Rainfall intensity (mm/hour)
T = Time of concentration (hours)

Event Duration (mins)	Rainfall Intensity (mm/hr)	Peak Runoff Rate (m3/s)	Total Inflow Volume (m3)	Total Outflow Volume (m3)	Required Storage Volume (m3)
10	178.56	0.54	324.1	35.1	289.0
15	142.89	0.43	389.0	52.6	336.4
20	119.95	0.36	435.4	70.2	365.2
25	103.85	0.31	471.2	87.7	383.5
30	91.87	0.28	500.2	105.3	394.9
35	82.58	0.25	524.6	122.8	401.8
40	75.15	0.23	545.6	140.4	405.2
45	69.05	0.21	564.0	157.9	406.1
50	63.95	0.19	580.4	175.5	404.9
55	59.62	0.18	595.2	193.0	402.2
60	55.89	0.17	608.71	210.6	398.13
65	52.65	0.16	621.1	228.1	393.0

Maximum Required Storage (m^3)	Peak Duration
406.1	45

ADS STORMWATER DETENTION SIZING TOOL



Appendix D

Fire Hydrant Flow Testing Results

FLOW TEST REPORT

OFFICE REPORT: OTTAWA ON

LOCATION: 1123 OLD MONTREAL RD ORLEANS ON.

DATE OF FLOW TEST: JULY 27 2021 **TIME OF FLOW TEST**: 09:00 AM

COMANY CONDUCTING TEST: *Troy Life & Fire safety* **CONDUCTED BY**: *MICH LACHANCE*

WITNESSED BY: MICHEAL McLEESE

W NOZZLE TYPE (HOSE MONSTER/PLAY PIPE): *LITTLE HOSE MONSTER*

WATER MAIN SIZE (IF AVAILABLE): 16”

DRANT ELEVATION COMPARED TO BUILDING: *SAME ELEVATION AS BUILDING*

HYDRANT FLOW DATA

STANDING PRESSURE (HYDR #1):	64PSI			
SIZE OF OPENING:	1”	1-1/8”	1-3/4”	2-1/2”
DISCHARGE COEFICIENT:			0.09	
PITOT READING (HYDRANT #2):			29PSI	
FLOW USGPM:			564GPM	
RESIDUAL PRESSURE (HYDRANT#1):			59PSI	

Google Maps Famille-Laporte Ave

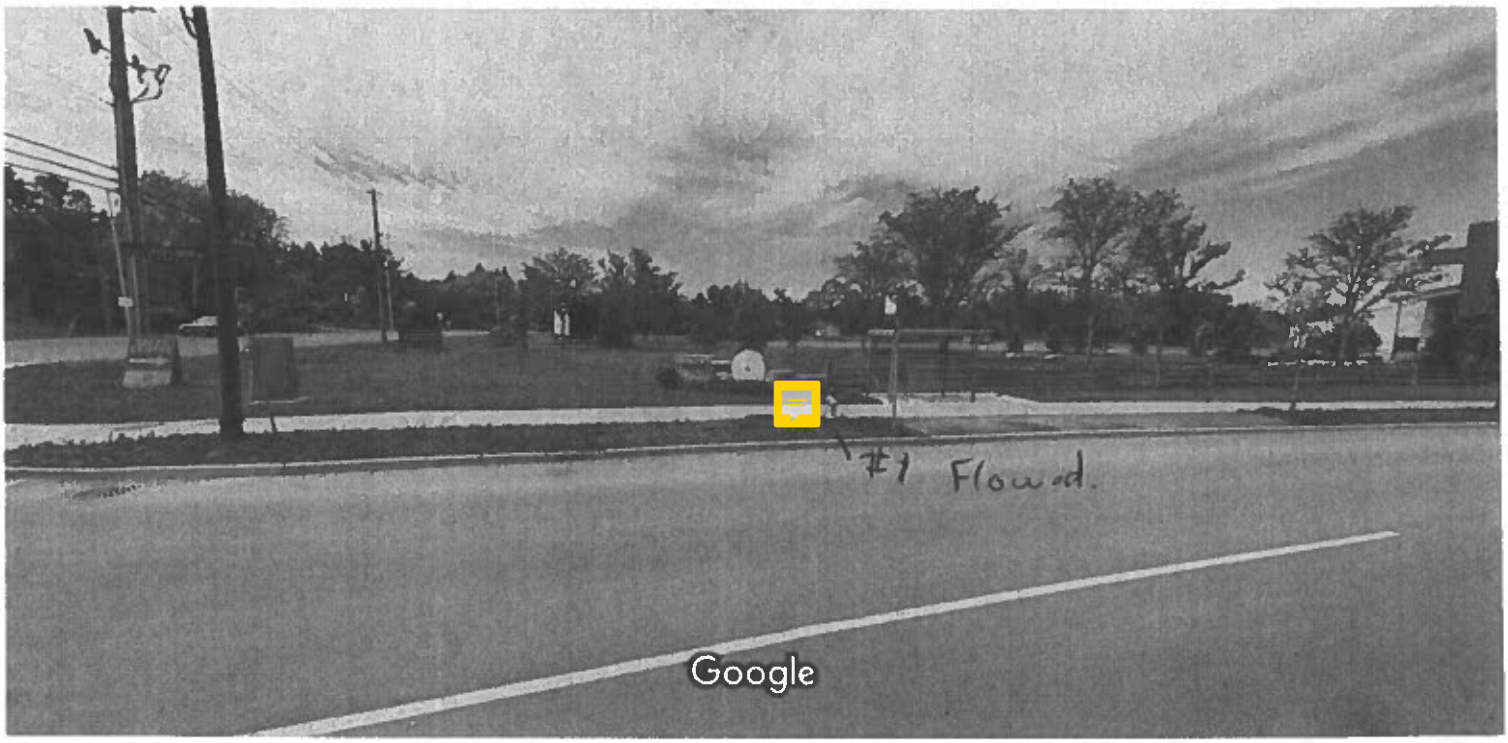


Image capture: Jun 2019 © 2021 Google

Ottawa, Ontario

Google

Google Maps 1128 Ch. Old Montréal Rd

Image capture: Jun 2019 © 2021 Google