349 Danforth Avenue, Ottawa
Servicing and Stormwater Management Report

Project # CW-03-20

Prepared for:

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By:

Arch-Nova Design Inc.

October 2020

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February 2022

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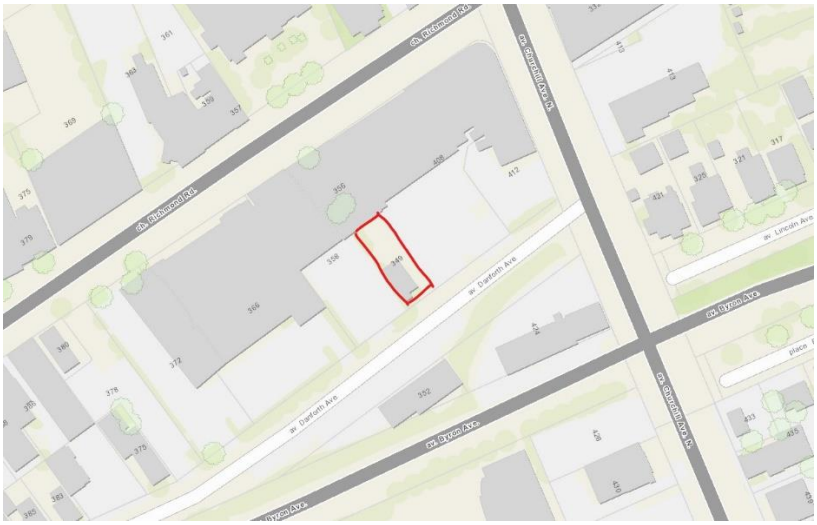
1. Introduction

The subject property is located at 349 Danforth Avenue, Ottawa. The proposed work comprises of a mixed use 3-storey, 10 apartment units and one commercial space[1]. For the purpose of this report the site is considered to run north-south. Danforth Avenue is extending east-west between Churchill Avenue on its east end and Roosevelt Avenue on its west end.

Currently the property is used as a residential lot with a single house which is scheduled for demolition. The rest of the lot is a driveway and a parking at rear of the property. On the east side of the property is separated with construction curbs from adjacent property, large parking lot. The property on the north is a commercial building. On the west side there is another parking lot.

The area is serviced by municipal water 150 mm, 225 mm sanitary sewer and 375 mm storm sewer. The sidewalk in front of the property is at elevation between 68.87 and 69.04 m. a.s.l.



349 Danforth Avenue, Ottawa: Location

[1] Revised architectural design January 2022

2. Public Services Capacity

This section of the report will analyze existing municipal services and the potential impact of the proposed building at 349 Danforth Avenue on the existing service capacity.

2.1 Water Supply

Existing building is supplied from 150 mm pipe and calculated consumption is 0.16 l/sec for the peak period.

Fire hydrant is located east from the property at distance of 7.50 m, which is sufficient for use of this hydrant by fire department and its vehicles and it provides fire protection for the site.

Design Parameter	Value
Residential Average Apartment	1.8 P/unit
Residential Average Daily Demand	280 L/d/P
Residential Maximum Daily Demand	9.5 x Average Daily *
Residential Maximum Hourly	1.5 x Maximum Daily *
Commercial Demand	2.5 L / m2 /d
Commercial Maximum Daily Demand	1.5 x Average Daily
Commercial Maximum Hourly	1.8 x Maximum Daily
Minimum Watermain Size	150mm diameter
Minimum Depth of Cover	2.4m from top of watermain to finished grade
During Peak Hourly Demand operating pressure must remain within	275kPa and 552kPa
During fire flow operating pressure must not drop below	140kPa
* Residential Max. Daily and Max. Hourly peaking factors per MOE Guidelines for Drinking-Water Systems Table 3-3 for 0 to 500 persons.	

Table 1: Water Supply Design Criteria

[2]The following are boundary conditions, HGL, for hydraulic analysis at 349 Danforth Avenue (zone 1W) assumed to be connected to the 150 mm on Danforth Avenue.

Minimum HGL = 108.0 m

[2] City of Ottawa boundary condition information is based on current operation of the city water distribution system (also see Appendix A for complete correspondence information)

Maximum HGL = 114.8 m

Max Day (0.61 L/s) + Fire Flow (105.0 L/s) = 101.0 m, the estimated ground elevation is 69.0 m.

The consumption was expected to be **54.60 l/min (0.91 L/sec)** for peak period. For the revised layout the consumption is reduced to **46.76 l/min (0.78 l.sec)**.

The fire flow for residential spaces was estimated to be 3,210 l/min (53.51 l/sec)[3]. The City staff provided information on available fire flow of **105.0 l/sec at 20psi and 69.0 m a.s.**l. With fire hydrant at distance of 7.5 m and available fire flow, the proposed building will be sufficiently protected from fire.

Fire flow calculated in accordance with Fire Underwriters Survey guideline is 8,000 l/min (133 l/sec) and it cannot be achieved so OBC calculation is recommended as the minimum required and sufficient.

Calculation in Table 1 presents the City of Ottawa design criteria based on MOE Guidelines.

The lateral pipe was sized to provide sufficient flow for peak requirements as well as to keep the velocity low to attenuate the noise and prevent the pressure surge in the system. See calculation below:

[3] OBC SectionA.3.2.5.7, Table 2.

Pressure Drop Online-Calculator

Calculation output

Flow medium:	Water 20 °C / liquid
Volume flow::	53.09 l/min
Weight density:	998.206 kg/m³
Dynamic Viscosity:	1001.61 10-6 kg/ms
Element of pipe:	circular
Dimensions of element:	Diameter of pipe D: 50 mm Length of pipe L: 5.7 m
Velocity of flow:	0.45 m/s
Reynolds number:	22456
Velocity of flow 2:	-
Reynolds number 2:	-
Flow:	turbulent
Absolute roughness:	0.0015 mm
Pipe friction number:	0.03
Resistance coefficient:	2.88
Resist.coeff.branching pipe:	-
Press.drop branch.pipe:	-
Pressure drop:	2.92 mbar 0 bar

2.2 Sanitary Sewer

Sanitary sewer outflow for the current building is 0.06 l/sec (wet weather peak flow). The lateral is connected to sanitary sewer 225 mm.

The estimated outflow for the new building is **0.27 l/sec** (peak flow + wet weather). For the revised layout the outflow is reduced to **0.23 l/sec**.

A commercial space is planned to be on the main floor and for such a reason a sanitary inspection manhole is proposed at the front of the building.

Existing municipal sewer 225 mm has a capacity of 2.89 l/sec for 0.46% slope and 20% full. For additional 0.20 l/sec the increase will be 6.9 %. The capacity at 80% full is 32.25 l/sec where the additional inflow makes 0.6%.

Design Parameter	Value
Residential Average Apartment	1.8 P/unit
Average Daily Demand	280 L/cap/day
Peaking Factor	Harmon's Peaking Factor. Max 4.0, Min 2.0
Correction Factor (City of Ottawa Tech.Bulletin ISTB-2018-01)	0.8
Commercial Space	28,000 L/ha/day
Infiltration and Inflow Allowance	0.33L/s/ha
Sanitary sewers are to be sized employing the Manning's Equation	Q =(1/n)AR2/3S1/2
Minimum Sewer Size	200mm diameter
Minimum Manning's 'n'	0.013
Minimum Depth of Cover	2.5m from crown of sewer to grade
Minimum Full Flowing Velocity	0.6m/s
Maximum Full Flowing Velocity	3.0m/s
Extracted from Sections 4 and 6 of the City of Ottawa Sewer Design Guidelines, November 2012 & Infrastructure Technical Bulletins 2018	

Table 2: Wastewater Design Criteria

Detailed calculation of pre and post development flow is presented in Appendix A.

2.3 Site Stormwater Services

Current building and the rest of surface of the lot at 349 Danforth Avenue represent a typical urban site. All stormwater runoff is under uncontrolled condition. For the purpose of protecting the municipal sewer system the City of Ottawa requires that the predevelopment 5-year runoff coefficient should be in range of C=0.5 so the newly developed site must store certain amount of water.

The proposed new building and area of the lot will increase the runoff to C=0.85 and this will require the stormwater retention on site in order to match the predevelopment runoff condition. For calculation of 100-year storm event C=1.0[4] is used.

Proposed stormwater retention will prevent increase of stormwater inflow into the system. Detailed calculation is provided in Appendix A. The stormwater storage is

[4] City of Ottawa requirements

proposed on the new building's flat roof. Total storage required for the 100 year event is 11.63 m^3.

Revised architectural design eliminated the basement level so the foundation drain (weeping tiles) will not be necessary. Geotechnical analysis found that ground water table is at 4.0 m below surfaces.

Rear yard will be drained to the front over a catch basin and a lateral to the front and to a 375 mm municipal storm sewer pipe. The lateral under the building has to be installed a concrete sleeve pipe.

Two roof scuppers with ICD control plates will be drained toward the front of the property. Both roof drains will provide maximum of 1.22 l/sec each.

3. Conclusion and Recommendation

3.1 Water Supply

The water supply demand calculation is based on the fire flow requirement for residential buildings; it is be 3,210 l/min (53.51 l/sec). The City provided information that required flow is available at 108.0 m of HGL. The building roof is at elevation of 79.0 m which leaves 32.0 psi of residual pressure at minimum pressure.

3.2 Sanitary Sewer

Existing concrete municipal sewer 225 mm has a capacity of 2.89 l/sec for 0.46% slope and 20% full. For additional 0.20 l/sec the increase will be 6.9 %. The capacity at 80% full is 32.25 l/sec where the additional inflow makes 0.6%.

Addition of new building should not overcharge existing system.

3.3 Stormwater

Currently all runoff is directed toward the street and catch basins. The proposed grading plan also directs all runoff toward the street. The proposed new building and area will store excess of water in order to match the predevelopment runoff.

The proposed new building and area of the lot will increase the runoff TO C=1.0 and this will require the stormwater retention on site in order to match the predevelopment runoff condition.

Proposed stormwater retention will prevent increase of stormwater inflow into the system. Detailed calculation is provided in Appendix A. The stormwater storage is proposed on the new building's flat roof. Total storage required for the 100 year event is 11.63 m^3.

The new development will not increase the runoff from the site so there will be no impact on the receiving system.

Prepared by:

Zoran Mrdja, P.Eng.

uthorized by Professional Engineers of Ontario to provide professional services to public

October 2020
Updated August 2021
Revised February 2022

Appendix A: Calculations

Water Supply Design Criteria

Design Parameter	Value
Residential Average Apartment	1.8 P/unit
Residential Average Daily Demand	280 L/d/P
Residential Maximum Daily Demand	9.5 x Average Daily *
Residential Maximum Hourly	1.5 x Maximum Daily *
Commercial Demand	2.5 L / m2 /d
Commercial Maximum Daily Demand	1.5 x Average Daily
Commercial Maximum Hourly	1.8 x Maximum Daily
Minimum Watermain Size	150mm diameter
Minimum Depth of Cover	2.4m from top of watermain to finished grade
must remain within	275kPa and 552kPa (40-80 psi; 28-56m)
During fire flow operating pressure must not drop below	140kPa (20 psi; 14 m)

* Residential Max. Daily and Max. Hourly peaking factors per MOE Guidelines for Drinking-Water Systems Table 3-3 for 0 to 500 persons.
** Daily consumption rate to align with the revised wastewater rates identified by City of Ottawa Technical Bulletin ISTB-2018-03. As a result, “Arch-Nova” is proposing for a deviation from the Water Supply Guidelines

Domestic Demand

Type of Housing	Per / Unit	Units	Pop
Single Family	3.4	0	0
Semi-detached	2.7		0
Townhouse	2.7		0
Apartment			0
Bachelor	1.4		0
1 Bedroom	1.4	6	8
2 Bedroom	2.1	4	8
3 Bedroom	3.1	0	0
4 Bedroom	4.2	0	0

	Pop	Avg. Daily		Max Day		Peak Hour	
		m^3/d	L/min	m^3/d	L/min	m^3/d	L/min
Total Domestic Demand	17	4.70	3.27	44.69	31.03	67.03	46.55

Institutional / Commercial / Industrial Demand

				Avg. Daily		Max Day		Peak Hour	
Property Type	**Unit Rate**		**Units**	m^3/d	L/min	m^3/d	L/min	m^3/d	L/min
Commercial floor space	2.5	$L/m^2/d$	45	0.11	0.08	0.17	0.12	0.30	0.21
Office	75.0	$L/9.3m^2/d$	0	0.00	0.00	0.00	0.00	0.00	0.00
Restaurant*	125.0	L/seat/d							
Industrial -Light	35,000.0	L/gross ha/d							
Industrial -Heavy	55,000.0	L/gross ha/d							
Total I/C/I Demand				0.11	0.08	0.17	0.12	0.30	0.21

Total Demand	4.82	3.34	44.86	31.15	67.34	46.76

* Estimated number of seats at 1seat per $9.3m^2$

Water Demand and Boundary Conditions

Proposed Conditions

Design Parameter	Anticipated Demand[1] (L/min)	Boundary Condition[2] (kPa)
Average Daily Demand	3.34	
Max Day + Fire Flow	8,031.03	
Peak Hour	46.76	

[1)] Water demand calculation per Water Supply Guidelines. See Appendix B for detailed calculations.

[2)] Boundary conditions supplied by the City of Ottawa. See Appendix B for correspondence with the City.

Wastewater Design Criteria

Design Parameter	Value
Residential Average Apartment	1.8 P/unit
Average Daily Demand	280 L/cap/day
Peaking Factor	Harmon's Peaking Factor. Max 4.0, Min 2.0
Correction Factor (City of Ottawa Tech.Bulletin ISTB-2018-0	0.8
Commercial Space	28,000 L/ha/day
Infiltration and Inflow Allowance	0.28L/s/ha
Sanitary sewers are to be sized employing the Manning's Equation	$Q = (1/n)AR^{2/3}S^{1/2}$
Minimum Sewer Size	200mm diameter
Minimum Manning's 'n'	0.013
Minimum Depth of Cover	2.5m from crown of sewer to grade
Minimum Full Flowing Velocity	0.6m/s
Maximum Full Flowing Velocity	3.0m/s
Extracted from Sections 4 and 6 of the City of Ottawa Sewer Design Guidelines, November 2012.	

349 Danforth Avenue, Ottawa
New

Sanitary Sewer Post Development Outflow

Site Area	**0.03 ha**
Extraneous Flow Allowances	
Infiltration / Inflow	**0.0099 L/s**

Domestic Contributions

Unit Type	Unit Rate	Units	**Pop**
Single Family	3.4	0	0
Semi-detached and duplex	2.7		0
Duplex	2.3		0
Townhouse	2.7		0
Apartment			
Bachelor	1.4		0
1 Bedroom	1.4	6	8.4
2 Bedroom	2.1	4	8.4
3 Bedroom	3.1	0	0
4 Bedroom	4.2	0	0
Total Population			**16.8**
Average Domestic Flow			**0.05 L/s**
Peaking Factor			**3.9**
Peak Domestic Flow			**0.21 L/s**

Institutional / Commercial / Industrial Contributions

Property Type	**Unit Rate**	**No. of Units**	**Avg Wastewater (L/s)**
Commercial	28,000 L/gross ha/d	0.03	0.01
Institutional	28,000 L/gross ha/d	0	0.00
Industrial - Light	35,000 L/gross ha/d	0	0.00
Industrial - Heavy	55,000 L/gross ha/d	0	0.00
Average I/C/I Flow			**0.01**
Peak Institutional / Commercial Flow*			**0.01**
Peak Industrial Flow**			**0.00**
Peak I/C/I Flow			**0.0097**

Total Estimated Average Dry Weather Flow Rate	**0.06**
Total Estimated Peak Dry Weather Flow Rate	**0.22**
Total Estimated Peak Wet Weather Flow Rate	**0.23**

Ottawa TechBulletin ISTB-2018-01 Section 4.4.1 Page 4.5

**Use Apendix 4B diagram

Fire Flow Calculation Ontario Building Code 2006 (Appendix A)

Project: 349 Danforth Avenue, Ottawa

Date: **February 18, 2022**

Data input by: Zoran Mrdja, P.Eng.

Type of Construction	Building Clasification	Water Supply Coefficient (K)
Non-combustable construction, or a heavy timber conforming to article 3.1.4.6	A-2; B1-; B-2; B-3 C; D	16

		Total Building Volume (V)(m3)
Building Height (incl.Basement)	17.10	4,013.43
Building Width	9.09	
Building Length	25.82	

Side	Exposure Distance (m)	Spatial Coefficient	Total Spatial Coefficient S_{tot}*
North	3.00	0.5	1.5
East	30.00	0	
South	30.00	0	
West	30.00	0	
Total Volume of Water Required Q**		**96,322.44**	
Minimum Required Fire Flow (L/min) ***		**3,210.75**	
Minimum Required Fire Flow (L/sec)		**53.51**	

Note:

* $S_{tot}= 1+(S_{side1}+S_{side2}+S_{side3}+S_{side4})$

** $V=KVS_{tot}$

*** Flow=Q/30 (min) for min. duration of 30 min

Summary:

1. City of Ottawa: available flow 105 l/sec (6,300 l/min) ***
2. Nearest fire hydrant distance 12.0 m;

FUS Fire Flow Calculations

Project:349 Danforth Avenue, Ottawa

Calculations Based on 1999 Publication "Water Supply for Public

Fire Protection " by Fire Underwriters' Survey (FUS)

Fire Flow Calculation #: 1

Date: February 18, 2022 Building Type/Description/Name: Apartment building

Data input by: Zoran Mrdja, P.Eng.

Table A: Fire Underwriters Survey Determination of Required Fire Flow - Long Method

Step	Task	Term	Options	Multiplier Associated with Option	Choose:	Value Used	Unit	Total Fire Flow (L/min)
1	Choose Frame Used for Construction of Unit	Framing Material						
		Coefficient related to type of construction (C)	Wood Frame	1.50	Ordinary Construction	1.00		
			Ordinary construction	1.00				
			Non-combustible construction	0.80				
			Fire resistive construction (< 2 hrs)	0.70				
			Fire resistive construction (> 2 hrs)	0.60				
2	Choose Type of Housing (if TH, Enter Number of Units Per TH Block)	Floor Space Area						
		Type of Housing	Single Family	1	Other (Comm, ind)	4	Units	
			Townhouse - indicate # of units	1				
			Other (Comm, Ind, etc.)	1				
2.2	# of Storeys	Number of Floors/ Storeys in the Unit (do not include basement):			3	3	Storeys	
3	Enter Ground Floor Area of One Unit	Enter Ground Floor Area (A) of One Unit Only :			173	759	Area in Square Meters (m^2)	
		Measurement Units	Square Feet (ft^2)	0.093	Square Metres (m2)			
			Square Metres (m^2)	253				
			Hectares (ha)	10000				
4	Obtain Required Fire Flow without Reductions	Required Fire Flow(without reductions or increases per FUS) (F = 220 * C * √A) Round to nearest 1000L/min						6,061
5	Apply Factors Affecting Burning	Reductions/Increases Due to Factors Affecting Burning						
5.1	Choose Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	N/A	-909
			Limited combustible	-0.15				
			Combustible	0.00				
			Free burning	0.15				
			Rapid burning	0.25				
5.2	Choose Reduction Due to Presence of Sprinklers	Sprinkler reduction	Complete Automatic Sprinkler Protection	-0.3	None	0.00	N/A	0
			None	0				
5.3	Choose Separation Distance Between Units	Exposure Distance Between Units	North Side	0-3 m	0.25	0.55	m	3,334
			East Side	20.1-30 m	0.1			
			South Side	20.1-30 m	0.1			
			West Side	20.1-30 m	0.1			
6	Obtain Required Fire Flow, Duration & Volume	Total Required Fire Flow, rounded to nearest 1000 L/min, with max/min limits applied:						8,000
		Total Required Fire Flow (above) in L/s:						133
		Required Duration of Fire Flow (hrs)						2.00
		Required Volume of Fire Flow (m^3)						960

Note: The most current FUS document should be referenced before design to ensure that the above figures are consistent with the intent of the Guideline

Legend	
	Drop down menu - choose option, or enter value.
	No Information, No input required.

Note:

The most current FUS document should be referenced before design to ensure that the above figures are consistent with the intent of the Guideline.

Project Number: CW-03-20 349 Danforth Avenue, Ottawa

ARCH-NOVA DESIGN INC.
Architecture
Engineering
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PRE-DEVELOPMENT

The pre-development time of concentration is 10 minutes

where:

$I_2 = 732.951 / (Tc + 6.199)^{0.810}$

$I_2 =$ **76.8 mm/hr**

$I_{100} = 1735.688 / (Tc + 6.014)^{0.820}$

$I_{100} =$ **178.6 mm/hr**

Surface Type	ID	Area (ha)	Percent of total Area	C	A X C (ha)	
Site	**A1**	0.03000	100.0%	0.70	0.021	
TOTAL		0.0300	100.0%		0.021	
Weighted C =					0.50	0.70

$Q_{2pre} = (2.78)*(C)*(I_5)*(A)$

$Q_{2pre} =$ 2.78 x 0.50 x 76.8 x 0.0300

$Q_{2pre} =$ 3.20 L/s

$Q_{100pre} = (2.78)*(C)*(I_{100})*(A)$

$Q_{100pre} =$ 2.78 x 0.63 x 178.6 x 0.0300

$Q_{100pre} =$ 9.31 L/s

C=0.4 used for predevelopment calculation (City of Ottawa requirement)

POST-DEVELOPMENT (UNCONTROLLED RUNOFF)

The post-development time of concentration is 10 minutes

where:

$I_2 = 732.951 / (Tc + 6.199)^{0.810}$

$I_2 =$ **76.8 mm/hr**

$I_{100} = 1735.688 / (Tc + 6.014)^{0.820}$

$I_{100} =$ **178.6 mm/hr**

Surface Type	ID	Area (ha)	Percent of total Area	C	A X C (ha)
Area	**A1**	0.0052	100.0%	0.30	0.002
Building	**A2**	0.0000	0.0%	0.00	0.000
TOTAL		0.0052	100.0%		0.002
Weighted C =					0.30

$Q_{2post} = (2.78)*(C)*(I_5)*(A)$

$Q_{2post} =$ 2.78 x 0.30 x 76.8 x 0.0052

$Q_{2post} =$ 0.33 L/s

$Q_{100post} = (2.78)*(C)*(I_{100})*(A)$

$Q_{100post} =$ 2.78 x 0.30 x 178.6 x 0.0052

$Q_{100post} =$ 0.77 L/s

Project Number: CW-03-20 349 Danforth Avenue, Ottawa

ARCH-NOVA DESIGN INC.
Architecture
Engineering
Consulting

PRE-DEVELOPMENT (CONTROLLED RUNOFF)

The pre-development time of concentration is 10 minutes

where:

$I_2 = 732.951 / (Tc + 6.199)^{0.810}$

$I_2 =$ **76.8 mm/hr**

$I_{100} = 1735.688 / (Tc + 6.014)^{0.820}$

$I_{100} =$ **178.6 mm/hr**

Surface Type	ID	Area (ha)	Percent of total Area	C	A X C (ha)
Site	A1	0.0000	0.0%	0.95	0.000
TOTAL		0.0000	0.0%		0.000
Weighted C =					0.60

C=0.6 used for predevelopment calculation (City of Ottawa requirement)

$Q_{2pre} = (2.78)*(C)*(I_5)*(A)$

$Q_{2pre} =$ 2.78 x 0.60 x 76.8 x 0.0000

$Q_{2pre} =$ 0.00 L/s

$Q_{100pre} = (2.78)*(C)*(I_{100})*(A)$

$Q_{100pre} =$ 2.78 x 0.60 x 178.6 x 0.0000

$Q_{100pre} =$ 0.00 L/s

POST-DEVELOPMENT (CONTROLLED RUNOFF)

The post-development time of concentration is 10 minutes

where:

$I_2 = 732.951 / (Tc + 6.199)^{0.810}$

$I_2 =$ **76.8 mm/hr**

$I_{100} = 1735.688 / (Tc + 6.014)^{0.820}$

$I_{100} =$ **178.6 mm/hr**

Surface Type	ID	Area (ha)	Percent of total Area	C	A X C (ha)
Landscape	A1	0.0000	0.0%	0.95	0.000
Building	A4	0.02485	100.0%	0.95	0.024
TOTAL		0.02485	0.0%		0.024
Weighted C =					1.00

$Q_{2post} = (2.78)*(C)*(I_5)*(A)$

$Q_{2post} =$ 2.78 x 1.00 x 76.8 x 0.0249

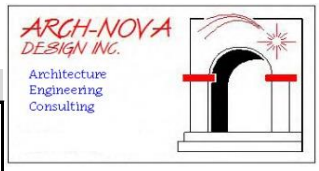
$Q_{2post} =$ 5.31 L/s

$Q_{100post} = (2.78)*(C)*(I_{100})*(A)$

$Q_{100post} =$ 2.78 x 1.00 x 178.6 x 0.0249

$Q_{100post} =$ 12.34 L/s

ALLOWABLE RUNOFF



Predevelopment Runoff:		
Uncontrolled Runoff		
2-year	3.20	l/sec
100-year	9.31	l/sec
Controlled Runoff:		
2-year	0.00	l/sec
100-year	0.00	l/sec

Postdevelopment Runoff:		
Uncontrolled Runoff		
2-year	0.33	l/sec
100-year	0.77	l/sec
Controlled Runoff:		
2-year	5.31	l/sec
100-year	12.34	l/sec

Controlled allowable runoff		
Controlled Runoff:		
2-year	**2.44**	**l/sec**
100-year	8.54	l/sec

Comment:

Storage Volumes (2-Year Storm)

349 Danforth Avenue, Ottawa

Tc = 10 (mins)
C_{AVG} = 1.00 (dimmensionless)
Area = 0.0348 (hectares)
Storm = 2 (year)
Release Rate = 2.44 (L/sec)
Time Interval = 10 (mins)

Duration (min)	Rainfall Intensity (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
1	148	1.4	2.44		
11	73	7.1	2.44	4.64	3.06
21	50	4.9	2.44	2.45	3.08
31	39	3.8	2.44	1.35	2.52
41	32	3.1	2.44	0.69	1.70
51	28	2.7	2.44	0.24	0.73
61	24	2.3	2.44	-0.09	-0.32
71	22	2.1	2.44	-0.34	-1.44
81	20	1.9	2.44	-0.53	-2.60
91	18	1.7	2.44	-0.69	-3.79
101	17	1.6	2.44	-0.83	-5.02
111	15	1.5	2.44	-0.94	-6.26
121	14	1.4	2.44	-1.04	-7.52
131	14	1.3	2.44	-1.12	-8.79
141	13	1.2	2.44	-1.19	-10.08
151	12	1.2	2.44	-1.26	-11.38
161	12	1.1	2.44	-1.31	-12.69
171	11	1.1	2.44	-1.37	-14.01
181	11	1.0	2.44	-1.41	-15.33
191	10	1.0	2.44	-1.45	-16.66
201	10	0.9	2.44	-1.49	-18.00
211	9	0.9	2.44	-1.53	-19.34
221	9	0.9	2.44	-1.56	-20.69
231	9	0.8	2.44	-1.59	-22.04
241	8	0.8	2.44	-1.62	-23.40
251	8	0.8	2.44	-1.64	-24.76
261	8	0.8	2.44	-1.67	-26.12
271	7.7	0.7	2.44	-1.69	-27.49

Notes

1) For a storm duration that is less than the time of concentration the peak flow is equal to the product of 2.78CIA and the ratio of the storm duration to the time of concentration.

2) Rainfall Intensity, I = 732.951 / (Tc + 6.199)^0.810 (2 year, City of Ottawa)
3) Peak Flow = Duration/Tc x 2.78 x C x I x A (Duration < Tc)
4) Peak Flow = 2.78 x C x I x A (Duration > Tc)
5) Storage = Duration x Storage Rate

Storage Volumes (100-Year Storm)

Tc = 10 (mins)
C_{AVG} = 1.00 (dimmensionless)
Area = 0.0348 (hectares)
Storm = 100 (year)
Release Rate = 2.44 (L/sec)
Time Interval = 10 (mins)

Duration (min)	Rainfall Intensity (mm/hr)	Peak Flow (L/sec)	Release Rate (L/sec)	Storage Rate (L/sec)	Storage (m^3)
1	351	3.4	2.44		
11	170	16.4	2.44	14.00	9.24
21	116	11.3	2.44	8.82	11.11
31	90	8.7	2.44	6.25	11.63
41	74	7.1	2.44	4.71	11.58
51	63	6.1	2.44	3.66	11.21
61	55	5.3	2.44	2.91	10.64
71	49	4.8	2.44	2.33	9.93
81	45	4.3	2.44	1.88	9.12
91	41	3.9	2.44	1.51	8.23
101	38	3.6	2.44	1.20	7.29
111	35	3.4	2.44	0.95	6.30
121	33	3.2	2.44	0.73	5.27
131	31	3.0	2.44	0.54	4.21
141	29	2.8	2.44	0.37	3.12
151	27	2.7	2.44	0.22	2.01
161	26	2.5	2.44	0.09	0.87
171	25	2.4	2.44	-0.03	-0.28
181	24	2.3	2.44	-0.13	-1.45
191	23	2.2	2.44	-0.23	-2.63
201	22	2.1	2.44	-0.32	-3.83
211	21	2.0	2.44	-0.40	-5.03
221	20	2.0	2.44	-0.47	-6.25
231	20	1.9	2.44	-0.54	-7.48
241	19	1.8	2.44	-0.60	-8.72
251	18	1.8	2.44	-0.66	-9.96
261	18	1.7	2.44	-0.72	-11.22
271	17	1.7	2.44	-0.77	-12.48

Notes

1) For a storm duration that is less than the time of concentration the peak flow is equal to the product of 2.78CIA and the ratio of the storm duration to the time of concentration.

2) Rainfall Intensity, I = 1735.688 / (Tc + 6.014)^0.820 (100 year, City of Ottawa)
3) Peak Flow = Duration/Tc x 2.78 x C x I x A (Duration < Tc)
4) Peak Flow = 2.78 x C x I x A (Duration > Tc)
5) Storage = Duration x Storage Rate

ARCH-NOVA DESIGN INC.
Architecture
Engineering
Consulting

Storage Requirements

2-year **3.08 m^3**

100-year **11.63 m^3**

Surface Type	ID	Area (ha)	Percent of total Area	Required Storage 5 year	Required Storage 100 year	Max Allowed Drain Outflow l/s	Max Allowed Drain Outflow GPM
Roof	**A1**	0.0087	50.0%	1.54	5.82	1.22	9.65
Roof	**A2**	0.0087	50.0%	1.54	5.82	1.22	9.65
TOTAL		0.0175	100.0%	3.08	11.63	2.44	19.30

Stage-Storage

Roof A1 (Scupper 1)			**Roof A2 (Scupper 2)**		
Depth m	**Area** m^2	**Volume** m^3	**Depth** m	**Area** m^2	**Volume** m^3
0.020	9.10	0.09	0.020	9.10	0.09
0.077	**40.00**	**1.54**	**0.077**	**40.00**	**1.54**
0.08	**65.00**	**2.60**	**0.08**	**65.00**	**2.60**
0.102	**115**	**5.87**	**0.102**	**115**	**5.87**

Legend:	
data for 2-year event	
data for 100-year event	

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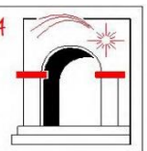
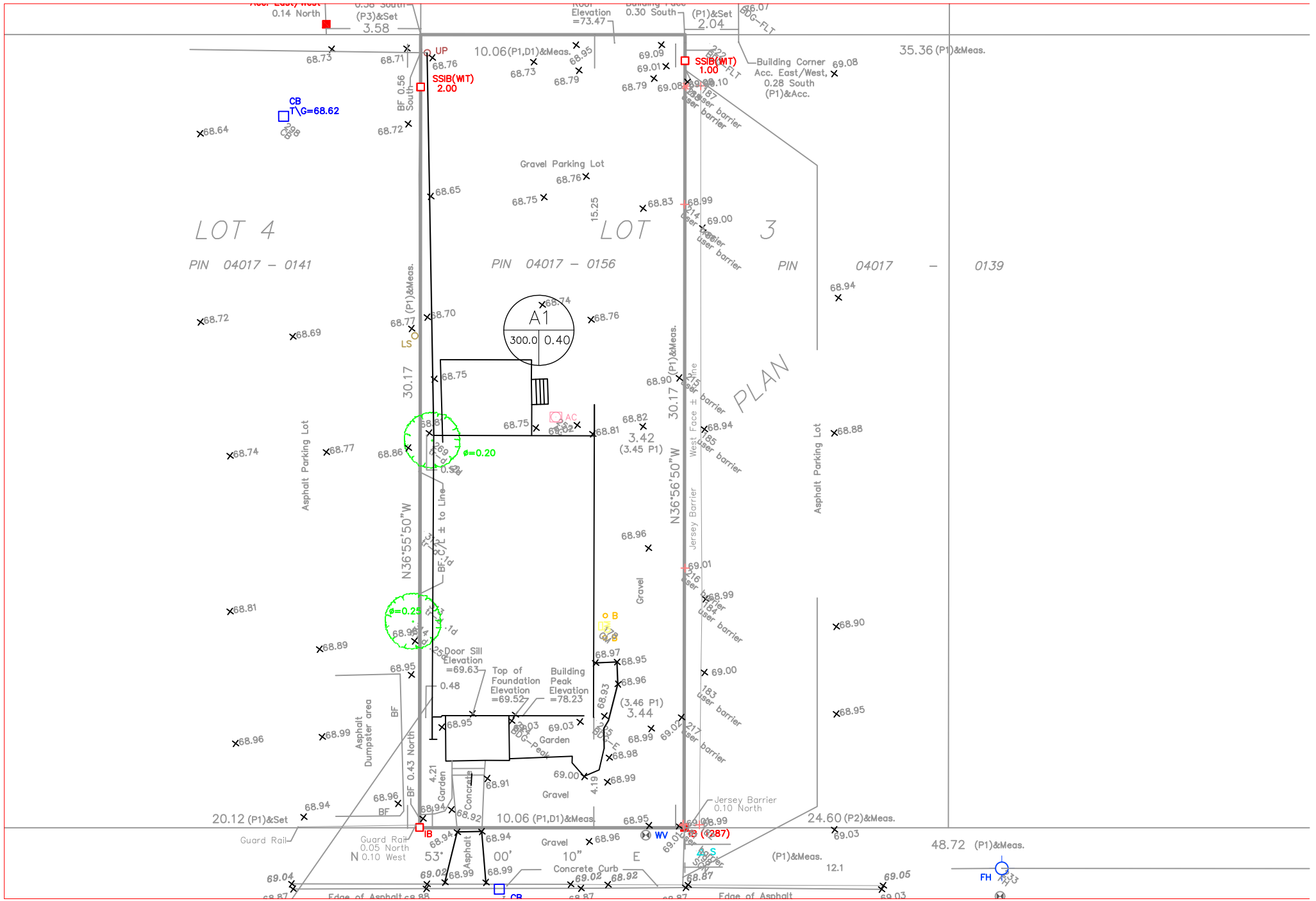
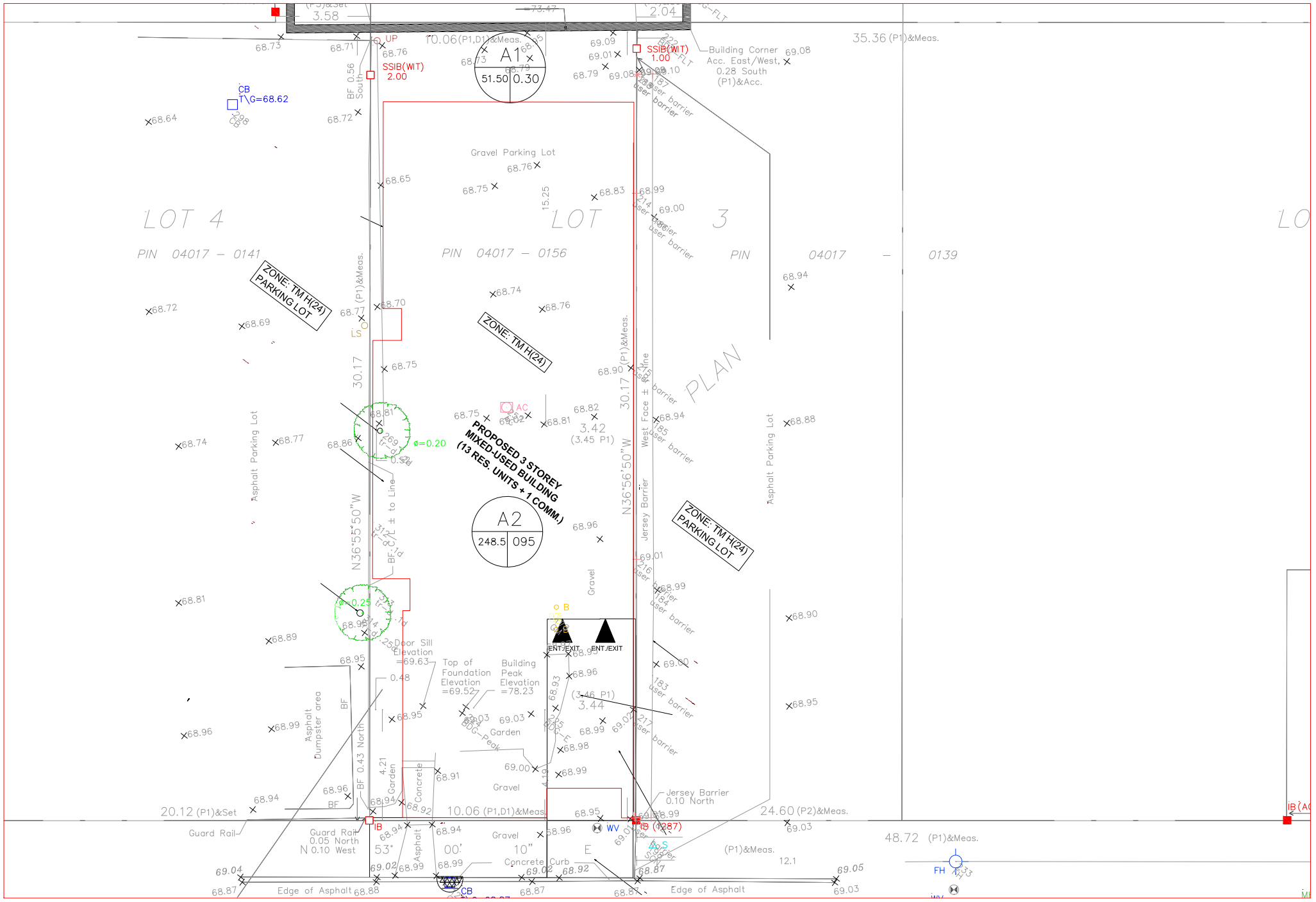
Architecture
Engineering
Consulting





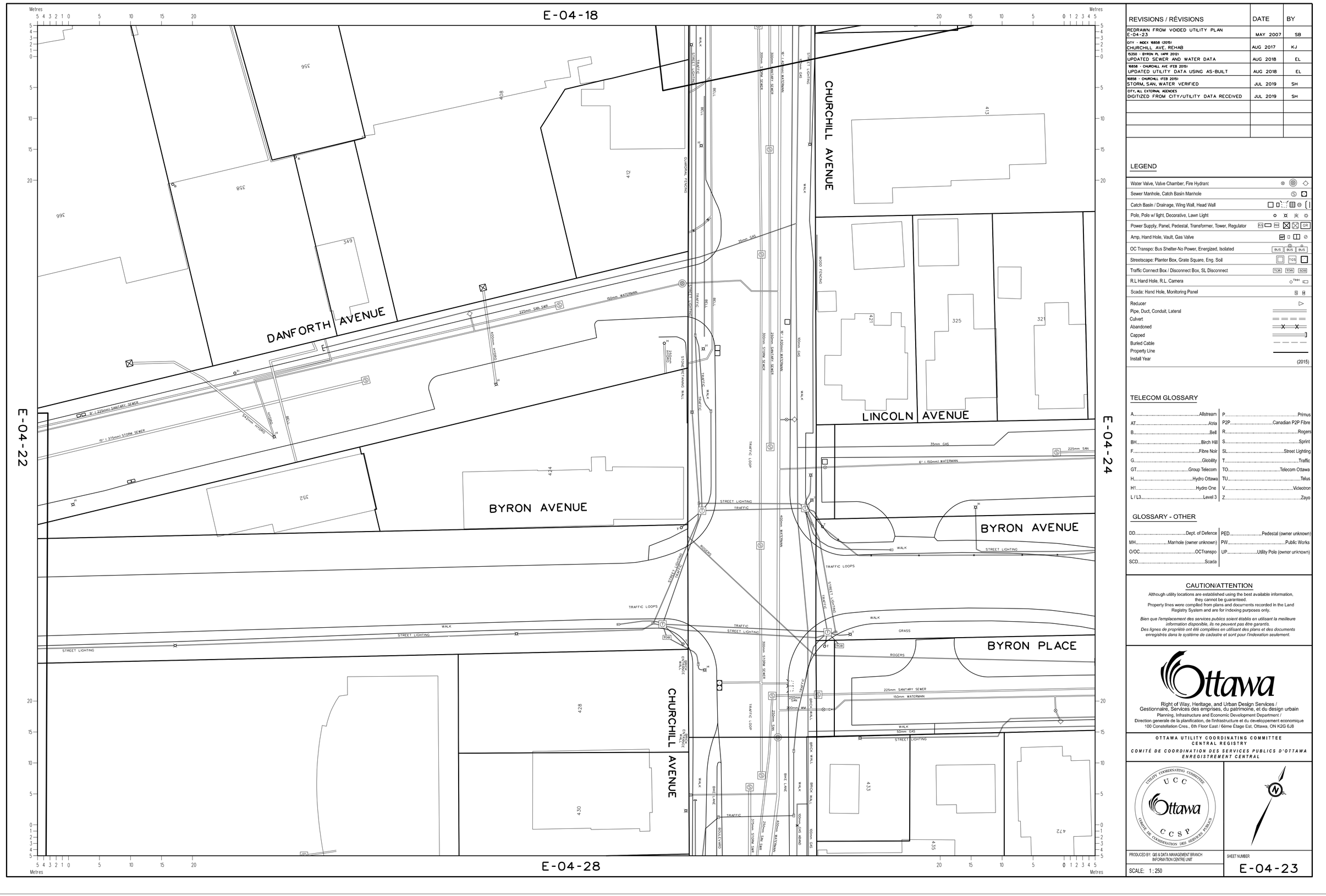
349 DANFORTH AVE., OTTAWA
SWM PREDEVELOPMENT

ARCH-NOVA Design Inc.
45 Banner Road NEPEAN ON K2H 8X5
613-702-3403 contact@archnova.ca



349 DANFORTH AVE., OTTAWA
SWM POSTEVELOPMENT

ARCH-NOVA Design Inc.
45 Banner Road NEPEAN ON K2H 8X5
613-702-3403 contact@archnova.ca



REVISIONS / RÉVISIONS	DATE	BY
REDRAWN FROM VOIDED UTILITY PLAN E-04-23	MAY 2007	SB
CITY - INDEX 16858 (2015) CHURCHILL AVE. REHAB	AUG 2017	KJ
15350 - BYRON PL (APR 2012) UPDATED SEWER AND WATER DATA	AUG 2018	EL
16858 - CHURCHILL AVE (FEB 2015) UPDATED UTILITY DATA USING AS-BUILT	AUG 2018	EL
16858 - CHURCHILL (FEB 2015) STORM, SAN, WATER VERIFIED	JUL 2019	SH
CITY, ALL EXTERNAL AGENCIES DIGITIZED FROM CITY/UTILITY DATA RECEIVED	JUL 2019	SH

LEGEND

Water Valve, Valve Chamber, Fire Hydrant	
Sewer Manhole, Catch Basin Manhole	
Catch Basin / Drainage, Wing Wall, Head Wall	
Pole, Pole w/ light, Decorative, Lawn Light	
Power Supply, Panel, Pedestal, Transformer, Tower, Regulator	P/S, PED, GR
Amp, Hand Hole, Vault, Gas Valve	
OC Transpo: Bus Shelter-No Power, Energized, Isolated	BUS, BUS, BUS
Streetscape: Planter Box, Grate Square, Eng. Soil	TGS
Traffic Connect Box / Disconnect Box, SL Disconnect	TCB, TDB, SDB
R.L Hand Hole, R.L. Camera	THH
Scada: Hand Hole, Monitoring Panel	
Reducer	
Pipe, Duct, Conduit, Lateral	
Culvert	
Abandoned	
Capped	
Buried Cable	
Property Line	
Install Year	(2015)

TELECOM GLOSSARY

A.....Allstream	P.....Primus
AT.....Atria	P2P.....Canadian P2P Fibre
B.....Bell	R.....Rogers
BH.....Birch Hill	S.....Sprint
F.....Fibre Noir	SL.....Street Lighting
G.....Globility	T.....Traffic
GT.....Group Telecom	TO.....Telecom Ottawa
H.....Hydro Ottawa	TU.....Telus
H1.....Hydro One	V.....Videotron
L / L3.....Level 3	Z.....Zayo

GLOSSARY - OTHER

DD.....Dept. of Defence	PED.....Pedestal (owner unknown)
MH.....Manhole (owner unknown)	PW.....Public Works
O/OC.....OCTranspo	UP.....Utility Pole (owner unknown)
SCD.....Scada	

CAUTION/ATTENTION

Although utility locations are established using the best available information, they cannot be guaranteed.
Property lines were compiled from plans and documents recorded in the Land Registry System and are for indexing purposes only.

Bien que l'emplacement des services publics soient établis en utilisant la meilleure information disponible, ils ne peuvent pas être garantis.
Des lignes de propriété ont été compilées en utilisant des plans et des documents enregistrés dans le système de cadastre et sont pour l'indexation seulement.

Ottawa
Right of Way, Heritage, and Urban Design Services /
Gestionnaire, Services des emprises, du patrimoine, et du design urbain
Planning, Infrastructure and Economic Development Department /
Direction generale de la planification, de l'infrastructure et du developpement economique
100 Constellation Cres., 6th Floor East / 6ème Étage Est, Ottawa, ON K2G 6J8

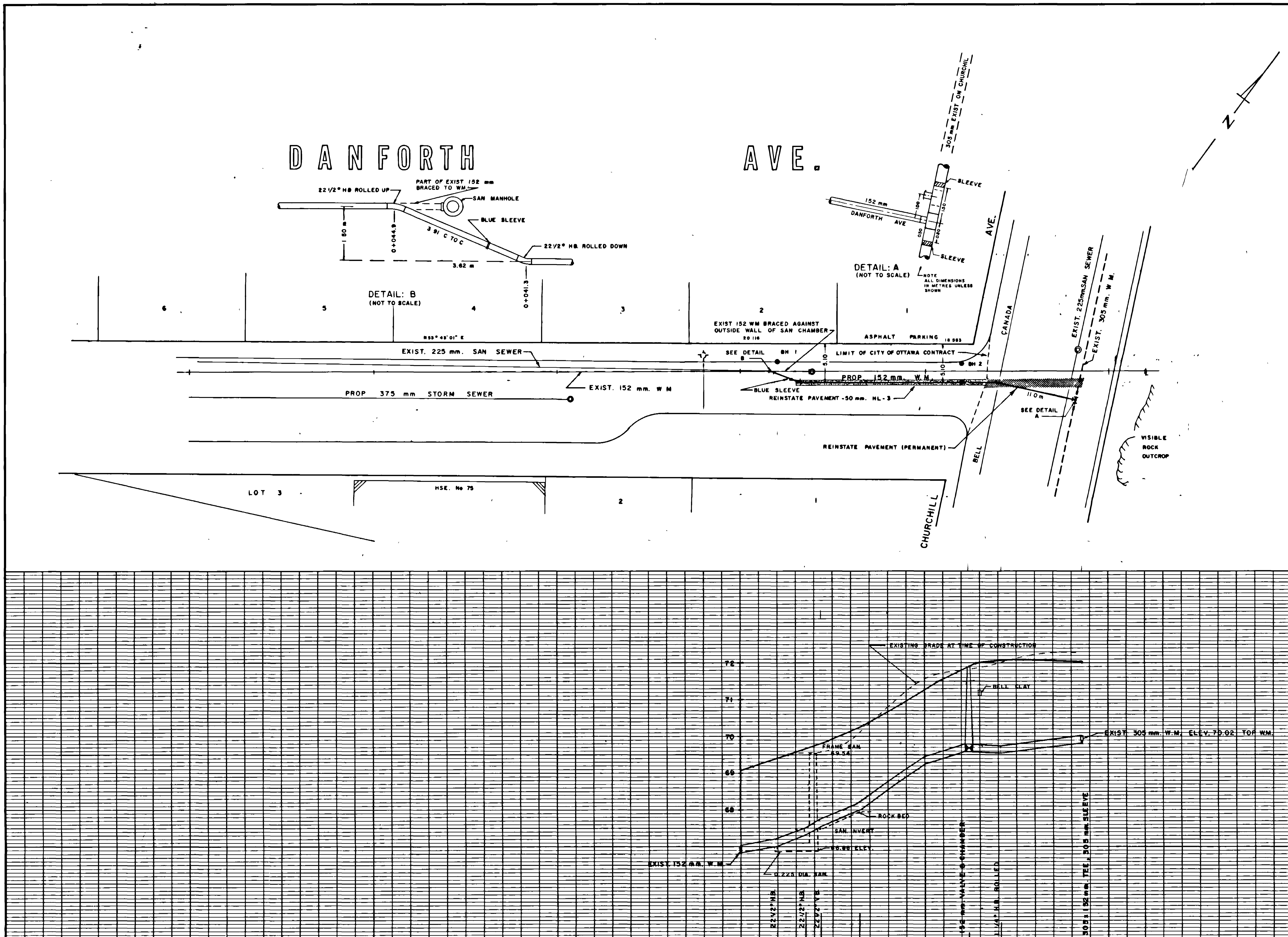
OTTAWA UTILITY COORDINATING COMMITTEE
CENTRAL REGISTRY
COMITÉ DE COORDINATION DES SERVICES PUBLICS D'OTTAWA
ENREGISTREMENT CENTRAL

UTILITY COORDINATING COMMITTEE UCC Ottawa CCSP COMITÉ DE COORDINATION DES SERVICES PUBLICS

PRODUCED BY: GIS & DATA MANAGEMENT BRANCH
INFORMATION CENTRE UNIT

SCALE: 1:250

SHEET NUMBER
E-04-23



STATIONS	PROPOSED ℄ OF ROAD	TOP OF WATERMAIN
+048	69.29	
+044.9		67.20
+043	69.52	
+041.3		67.48
+039.10		67.66
+038	69.89	67.7
+034		68.17
+033	70.38	
+028.3	70.93	68.96
+025		69.44
+023	71.49	
+019.0		69.79
+018	72.04	
+014.6		69.74
+003.6		70.02
0.00		

Regional Municipality of Ottawa-Carleton Works Department

R O PICKARD
Works Commissioner

Engineer in Charge of Design & Construction
Date 15/6/84

T. J. SLACK — REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO

Project Officer: Timothy J Slack, P.Eng. Date: June 15, 1984.

Drawn by: N H M Date: JUNE/84

Approved by: Date:

Notes

"WATERMAINS AND SERVICE CONNECTIONS TO RECEIVE FROST PROTECTION AS REQUIRED, PER R.M O.C. STANDARDS AND SPECIFICATIONS"

Scales
HOR: 1-250
VERT: 1-50

REVISIONS
1. "AS BUILT" FROM FIELD BOOK NO 660 & FIELD PRINT JAN./85 RM.

Project Title
DANFORTH AVE, CHURCHILL AVE.-to 50 m. WEST.

Drawing No.: 3117 Sheet

K+E HERCULENE DRAFTING FILM

7254

1772 DANFORTH AVENUE

Appendix B: Correspondence

zoran@archnova.ca

From: Valic, Jessica <jessica.valic@ottawa.ca>
Sent: July 29, 2020 7:24 AM
To: Zoran@archnova
Subject: RE: 349 Danforth Avenue: boundary conditions

Good Morning Zoran,

The City does not have capacity concerns with either the storm or sanitary systems fronting this development considering the size of the proposed development and modelling was not completed. The proposed sanitary flow is low, and as there is an existing building at this property connected to the sanitary system, the slightly increased sanitary flow from existing is not considered a concern.

Regarding stormwater, controlling to the 2-year storm will be required, as was initially specified. As the proposed building will take up the majority of the site, it is assumed that rooftop storage or subsurface storage of roofwater will be used for control. The remainder of the site would be permitted to drain uncontrolled to the ROW since the runoff generated from these areas would be low and impractical to control.

Please do not hesitate to contact me with any questions/concerns.

Regards,

Jessica Valic, E.I.T.
Project Manager
Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique
Development Review - West
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1
613.580.2424 ext./poste 15672
jessica.valic@ottawa.ca

****Please note that due to the current situation, I am working remotely. Email is currently the best way to contact me****

From: Zoran@archnova <zoran@archnova.ca>
Sent: July 20, 2020 3:18 PM
To: Valic, Jessica <jessica.valic@ottawa.ca>
Subject: Re: 349 Danforth Avenue: boundary conditions

Hello Jessica,

Thank you for your quick response. For the sanitary sewer I already sent it to you; please check the pdf file I sent in previous email.
For storm sewer we need current capacity in order to determine max allowable runoff from the site. For your reference please check with Shawn Wessel how we did it for 374 McArthur.

Regards,

Zoran Mrdja
Sent from my iPhone

On 20 Jul 2020, at 14:05, Valic, Jessica <jessica.valic@ottawa.ca> wrote:

Good afternoon Zoran,

Boundary conditions are below.

Could you please supply the storm demand for the proposed development? This value is needed to add into the city sewer model system to determine the sewer capacity.

The following are boundary conditions, HGL, for hydraulic analysis at 349 Danforth (zone 1W) assumed to be connected to the 152mm on Danforth (see attached PDF for location).

Minimum HGL = 108.0m

Maximum HGL = 114.8m

Available flow @ 20psi = 105L/s assuming a ground elevation of 69.0m

These are for current conditions and are based on computer model simulation.

Disclaimer: The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation.

Please do not hesitate to contact me with any questions/concerns.

Regards,

Jessica Valic, E.I.T.
Project Manager
Planning, Infrastructure and Economic Development Department - Services de la planification, de l'infrastructure et du développement économique
Development Review - West
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1

613.580.2424 ext./poste 15672
jessica.valic@ottawa.ca

****Please note that due to the current situation, I am working remotely. Email is currently the best way to contact me****

From: zoran@archnova.ca <zoran@archnova.ca>
Sent: July 14, 2020 6:50 PM
To: Valic, Jessica <jessica.valic@ottawa.ca>
Cc: Turkington, Seana <Seana.Turkington@ottawa.ca>
Subject: 349 Danforth Avenue: boundary conditions

Please could you provide the boundary conditions for the location of 349 Danforth Avenue, Ottawa? The owner is planning to construct a new apartment building at this location. Attached are the water and sewer calculations, the fire flow calculation and the site plan for proposed development.

Type of development: apartment building (basement + 3 stories)

Average daily demand: 0.07 l/s

Maximum daily demand: 0.67 l/s.

Maximum hourly daily demand: 1.01 l/s.
Fire flow: 133 l/sec (FUS)

Also, please could you confirm the residual capacity for municipal sanitary and storm pipes at the site?

Regards,

Zoran Mrdja, P.Eng., FEC
DufkQryd Ghvljq Inf1
613-818-3884

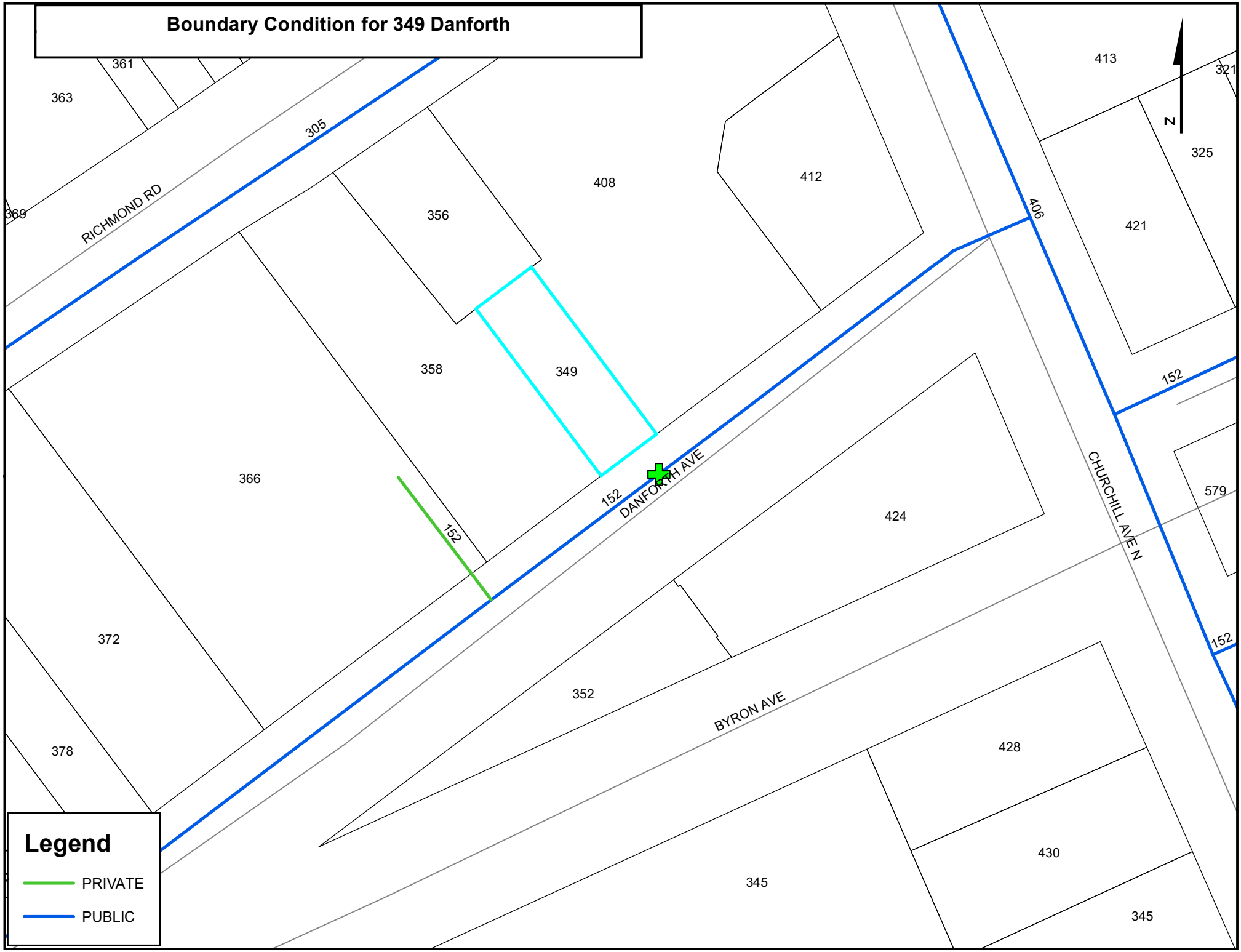
'

'

<349 Danforth July 2020.pdf>

'

'


Boundary Condition for 349 Danforth
361
363
305
RICHMOND RD
369
356
408
412
413
321
325
N
406
421
358
349
366
152
DANFORTH AVE
152
424
CHURCHILL AVE N
579
152
372
352
BYRON AVE
428
378
430
345
345
Legend
PRIVATE
PUBLIC

zoran@archnova.ca

From: Fernando Matos <fernando@ottawacarletonconstruction.com>
Sent: April 21, 2020 3:17 PM
To: Zoran@archnova
Subject: FW: 349 Danforth Avenue Pre-consultation Follow-up
Attachments: 349 Danforth Ave_List of Required Studies and Plans.pdf; 349 Danforth Avenue_Pre-consultation Comments_April 2020.pdf

Hi Zoran, can you price the engineering for the project at 349 Danforth.

OTTAWA CARLETON Construction Ltd.

Fernando Matos
Principal/COO
Ottawa Carleton Construction Group Ltd.
337 Sunnyside Ave, Suite 101, Ottawa, ON K1S 0R9
c. | 613-884-4425
e. | fernando@ottawacarletonconstruction.com
w. | www.ottawacarletonconstruction.com

From: Turkington, Seana <Seana.Turkington@ottawa.ca>
Sent: Tuesday, April 21, 2020 2:59 PM
To: Fernando Matos <fernando@ottawacarletonconstruction.com>
Cc: Valic, Jessica <jessica.valic@ottawa.ca>; Dubyk, Wally <Wally.Dubyk@ottawa.ca>; Moise, Christopher <christopher.moise@ottawa.ca>; Carvajal, Solé Carvajal <sole.carvajal@ottawa.ca>; Richardson, Mark <Mark.Richardson@ottawa.ca>
Subject: 349 Danforth Avenue Pre-consultation Follow-up

Hello Fernando,

Hope this finds you well during these unprecedented times. Please find attached two documents related to the pre-consultation for the proposed 3-storey mixed-used building at 349 Danforth Avenue. Document 1 is a list of required studies and plans should you submit a formal site plan application. Document 2 contains the meeting minutes from our teleconference held April 9th, 2020 along with additional comments and considerations related to the proposal.

The attached pre-consultation comments are valid for one year. If you submit a development application after this time, you may be required to meet for another pre-consultation meeting and/or the submission requirements may change.

Please do not hesitate to contact me should you have any questions.

Kind regards,

Seana Turkington
Planner | Urbaniste

Development Review | Examen des demandes d'aménagement
Planning, Infrastructure and Economic Development | Services de planification, d'infrastructure et de développement économique
City of Ottawa | Ville d'Ottawa
110 Laurier Avenue West, Ottawa, ON | 110, avenue Laurier Ouest, Ottawa ON K1P 1J1
P: 613-580-2424 ext./poste 27790
E: seana.turkington@ottawa.ca

'

'

Site Plan Control Pre-consultation

Meeting Date: April 9, 2020

349 Danforth Avenue

Applicant:	Fernando Matos	**Consultant:**	N/A
Ward	15	**Councillor**	Jeff Leiper

Proposal Summary: Site Plan Control application required for a proposed three storey mixed-use building, with 702 sq. ft. of commercial space and 13 dwelling units.

Attendees:

Fernando Matos, applicant
Solé Carvajal, Planner, PIEDD, City of Ottawa
Wally Dubyk, Transportation Project Manager, PIEDD, City of Ottawa
Christopher Moise, Architect, OAA & Urban Designer, PIEDD, City of Ottawa
Mark Richardson, Forester, PIEDD, City of Ottawa
Seana Turkington, Planner, PIEDD, City of Ottawa
Jessica Valic, EIT, PIEDD, City of Ottawa

Comments

Proposal Details

- Proposal to construct a three storey mixed-use building with a 702 square foot commercial space on the ground floor and 13 residential units, ranging in size from 373 square feet to 660 square feet. The commercial space would likely be utilized for a personal service business, which is a permitted use under the TM zone.
- Associated with the proposal is 7 bike parking spaces in the basement and 150 sq. ft. amenity space (in rear yard and on rooftop).
- The proposed building would have a total footprint of approximately 270 square metres.

Planning Comments- Solé Carvajal and Seana Turkington

Official Plan: Traditional Mainstreet

Secondary Plan and/or Community Design Plan: Richmond Road/Westboro Secondary Plan and Richmond Road/Westboro CDP

Zoning By-law: TM H(24)

Other:

- As per Schedule 1A of the Zoning By-law, the site is designated Area Y, which extends 100m from the centerline of Richmond Road. Buildings four storeys or less in Area Y do not require parking. Please see Part 4 of the Zoning By-law for more details.
- The site is within 600m of both the Westboro and Dominion LRT stations.
- Schedule C-2 of the Secondary Plan contemplates a maximum permitted height of 7-9 storeys along this portion of Danforth Avenue. It is recommended that an increase in height be considered. An increase in height would require further discussions with staff prior to a formal application submission but would better align with the planned context for Danforth Avenue.
- On the floor plans provided, two residential units are proposed for the ground floor, with one being an accessible unit and 373 square feet in size. It is recommended that these units be combined, to create one large residential unit which would be more accessible.
- It is recommended that a interior side yard setback be provided so as to provide access to the rear and to allow for maintenance.

Prepared by S. Turkington
Date: April 21, 2020

- Please ensure a secondary emergency access is provided.
- Minor variances may be required. Any variances needed would be confirmed after the first review of a formal site application. Please consider how far any eaves/ornamental features project, as the By-law does not permit projections closer than 0.6m to a lot line. Please also consider canopies provided.
- As well, note that for a personal service business the required parking space rate is 1.25 per 100 square metres.
- The bike parking rate as per Section 111 for both the residential use and the personal service business would need to be met. Please also refer to Section 111 to ensure the proposed spaces meet the By-law requirements in terms of dimensions and the necessary aisle width for access to and from the required parking spaces.

Urban Design Comments- Christopher Moise

- We would like to understand what variances are being sought.
- We would like the proponent to investigate how their design may be impacted by future development on properties immediately surrounding the site (p.3 of concept plan).
- We notice a few areas around the building that would be negatively impacted by future development of a similar nature with zero side and rear-yard setbacks ie:
  - The window well facing the street (p.9 as per the concept plan provided);
  - The sunken well as a rear yard (p.9 as per the concept plan provided);
  - The primary residential entrance set halfway back on the east side of the building;
  - The ramp to the garbage storage on the west side of the building;
  - The residential windows inset on the side yard with minimal side yard setback;
    - ***Consider how these conditions would be impacted by a six storey blank wall condition which is an allowable planned context for this zone;***
- If a commercial unit is pursued it would best support the burgeoning mixed-use block and public realm if it was accessible at grade in this TM zone;
- Residential units below grade become particularly problematic regarding access to light in the rear and forcing the commercial unit to be above grade at the street;
- Suggest that the project at 386 Richmond be referenced as precedent for this proposal, as it has a number of comparable elements and conditions (lot size, use, surrounding context, etc.);

This is an exciting project in an area full of potential. We look forward to helping you achieve its goals with the highest level of design resolution. Good luck.

Engineering Comments- Jess Valic

Infrastructure

Watermain – 150mm (UCI) – 1940

Sanitary - 225mm (Concrete) – 1940

Storm – 375mm (Concrete) – 1985

Servicing Criteria

The following apply to this site:

- Coefficient (C) of runoff will need to be determined **as per existing conditions** but in no case more than 0.5
- TC = 20 minutes or can be calculated

  TC should be not be less than 10 minutes, since IDF curves become unrealistic at less than 10 min.
- Any storm events greater than 2 year, up to 100 year, and including 100- year storm event must be detained on site.
- Foundation drains to be independently connected to storm sewer
- Roof drains are to be connected downstream of any incorporated ICD within the SWM system
- Applicant needs to contact Rideau Valley Conservation Authority (RVCA) for possible restrictions due to quality control. Please provide correspondence in Report.
- Any sunken entrances must be drained, and drain must not be directly connected to weeping tile
- Submit completed Servicing Study Checklist with completed servicing study/brief.

Water Boundary Conditions:

Will be provided at request of consultant. Requests must include the location of the service and the expected loads required by the proposed development. Please provide the following and submit Fire Flow Calculation Sheet per FUS method with the request:

- Location of service
- Type of development and amount of required fire flow (per FUS method – include FUS calculation sheet with request)
- Average Daily Demand (l/s)
- Maximum Hourly Demand (l/s)
- Maximum Daily Demand (l/s)
- Water Supply Redundancy – Fire Flow:
  Applicant to ensure that a second service with an inline valve chamber be provided where the average daily demand exceeds 50 m³ / day (0.5787 l/s per day)

Noise Study:

- Traffic Noise Study is required – within 20m of Richmond Rd (arterial); include rooftop amenity space (if applicable).
- Stationary Noise Study – consultant to speak to this in their report as per City NCG and NPC 300 Guidelines.

Phase I and Phase II ESA:

- Phase I ESA is a requirement; Phase II ESA requirement will be dependent on the result of the Phase I ESA. Phase I ESA must include Ecolog ERIS Report.
- Phase I ESAs and Phase II ESAs must conform to clause 4.8.4 of the Official Plan that requires that development applications conform to Ontario Regulation 153/04.

Site Plan submission requirements for engineering drawings:

- Site Servicing Plan
- Grade Control and Drainage Plan
- Erosion and Sediment Control Plan (Can be combined with grading plan)

Report Submission Requirements[1]:

- Servicing/Stormwater Management Report
- Geotechnical Study
- Phase I ESA
- Phase II ESA (depends on outcome of Phase I)
- Noise study

Other Requirements

- Gas Blow Off Station - Gas companies now require a pedestal either on ped island or next to building, for buildings that exceed 12 units. Include this on the Grading, Site Servicing, SWM and Landscape plans.

  Gas Blow Off Station.pdf

- Roof Drainage Plan (if roof drainage is proposed)
- Please submit a plan of proposed roof drainage
- Please also note:
  - Provide roof drain type with specified opening setting and controlled flow rate (Q).
  - Provide 2, 5 and 100 year storm event flood plain area on roof.
  - Provide scupper locations with outlet elevation.

General Information:

- The Servicing Study Guidelines for Development Applications are available at the following address: https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans#servicing-study-guidelines-development-applications
- Servicing and site works shall be in accordance with the following documents:
  - Ottawa Sewer Design Guidelines (October 2012)
  - Ottawa Design Guidelines – Water Distribution (2010)
  - Geotechnical Investigation and Reporting Guidelines for Development Applications in the City of Ottawa (2007)
  - City of Ottawa Slope Stability Guidelines for Development Applications (revised 2012)
  - City of Ottawa Environmental Noise Control Guidelines (January, 2016)
  - City of Ottawa Park and Pathway Development Manual (2012)
  - City of Ottawa Accessibility Design Standards (2012)
  - Ottawa Standard Tender Documents (latest version)
  - Ontario Provincial Standards for Roads & Public Works (2013)

- Record drawings and utility plans are also available for purchase from the City (Contact the City's Information Centre by email at InformationCentre@ottawa.ca or by phone at (613) 580-2424 x.44455).
- Any proposed work in utility easements requires written consent of easement owner.

Transportation Comments-Wally Dubyk

- This development falls under a TOD area. The development requires TDM measures that support achieving the area mode share targets. As the development would not generate enough traffic, a full TIA report is not required.
- Please fill out the TIA Screening form and send to City staff prior to formal site plan submission.
- Bicycle parking spaces are required as per Section 111 of the Ottawa Comprehensive Zoning By-law. Bicycle parking spaces should be located in safe, secure places near main entrances and preferably protected from the weather.
- The closure of an existing private approach shall reinstate the sidewalk, shoulder, curb and boulevard to City standards.
- Danforth Ave is designated as a local roadway. There are no plans at this time for the City to implement a sidewalk along this section of Danforth Ave. If the Owner decides to install a sidewalk, that is up to them. Construction of such a sidewalk would need to follow the City's standards and guidelines.

Forestry Comments-Mark Richardson

- Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City; an approved TCR is a requirement of Site Plan approval.
- Any removal of privately-owned trees 10cm or larger in diameter requires a tree permit issued under the Urban Tree Conservation Bylaw; the permit is based on the approved TCR.
- Any removal of City-owned trees will require the permission of Forestry Services who will also review the submitted TCR. The TCR may be combined with the Landscape Plan.
- The TCR must list all trees on site by species, diameter, health condition and ownership.
- The TCR must address all trees with a critical root zone that extends into the developable area – all trees that could be impacted by the construction that are outside the developable area need to be addressed.
- Trees with a trunk that crosses/touches a property line are considered co-owned by both property owners; permission from the adjoining property owner must be obtained prior to the removal of co-owned trees.
- If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained – please provide a plan showing retained and removed treed areas.
- All retained trees must be shown and all retained trees within the area impacted by the development process must be protected as per City guidelines listed on Ottawa.ca

    a. the location of tree protection fencing must be shown on a plan
    b. include distance indicators from the trunk of the retained tree to the nearest part of the tree protection fencing
    c. show the critical root zone of the retained trees
    d. if excavation will occur within the critical root zone, please show the limits of excavation and calculate the percentage of the area that will be disturbed

- The City encourages the retention of healthy trees; if possible, please seek opportunities for retention of trees that will contribute to the design/function of the site.

- Please ensure any newly planted/ proposed trees have an adequate soil volume for their size at maturity. Identify soil volumes on the LP. Here are the recommended soil volumes:

Tree Type/Size	Single Tree Soil Volume (m3)	Multiple Tree Soil Volume (m3/tree)
Ornamental	15	9
Columnar	15	9
Small	20	12
Medium	25	15
Large	30	18
Conifer	25	15

- Please have the LA/TCR cosultant contact Mark Richardson mark.richardson@ottawa.ca the Planning Forester to discuss the TCR requirements.

Application Submission Information

Application Type: **Site Plan Control, Standard, Staff Approval (based on plans discussed at the teleconference meeting of April 9, 2020)**

For information on Site Plan Control Thresholds under the Site Plan Control By-law, please visit: https://documents.ottawa.ca/sites/documents/files/siteplan_thresholds_en.pdf

For information on Applications, including fees, please visit: https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/fees-and-funding-programs/development-application-fees

The application processing timeline generally depends on the quality of the submission. For more information on standard processing timelines, please visit: https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/development-application-forms#site-plan-control

Prior to submitting a formal application, it is recommended that you pre-consult with the Ward Councillor.

Application Submission Requirements

For information on the preparation of Studies and Plans and the City's Planning and Engineering requirements, please visit: https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans

Please provide electronic copy (PDF) of all plans and studies required.

All plans and drawings must be produced on A1-sized paper and folded to 21.6 cm x 27.9 cm (8½"x 11").

Note that many of the plans and studies collected with this application must be signed, sealed and dated by a qualified engineer, architect, surveyor, planner or designated specialist.

Servicing study guidelines for development applications

4. Development Servicing Study Checklist

The following section describes the checklist of the required content of servicing studies. It is expected that the proponent will address each one of the following items for the study to be deemed complete and ready for review by City of Ottawa Infrastructure Approvals staff.

The level of required detail in the Servicing Study will increase depending on the type of application. For example, for Official Plan amendments and re-zoning applications, the main issues will be to determine the capacity requirements for the proposed change in land use and confirm this against the existing capacity constraint, and to define the solutions, phasing of works and the financing of works to address the capacity constraint. For subdivisions and site plans, the above will be required with additional detailed information supporting the servicing within the development boundary.

4.1 General Content

- ☐ Executive Summary (for larger reports only).
- ☒ Date and revision number of the report.
- ☒ Location map and plan showing municipal address, boundary, and layout of proposed development.
- ☒ Plan showing the site and location of all existing services.
- ☐ Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere.
- ☐ Summary of Pre-consultation Meetings with City and other approval agencies.
- ☐ Reference and confirm conformance to higher level studies and reports (Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defendable design criteria.
- ☐ Statement of objectives and servicing criteria.
- ☒ Identification of existing and proposed infrastructure available in the immediate area.
- ☐ Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development (Reference can be made to the Natural Heritage Studies, if available).
- ☐ Concept level master grading plan to confirm existing and proposed grades in the development. This is required to confirm the feasibility of proposed stormwater management and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths.
- ☐ Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts.
- ☐ Proposed phasing of the development, if applicable.

☐ Reference to geotechnical studies and recommendations concerning servicing.

☒ All preliminary and formal site plan submissions should have the following information:
- Metric scale
- North arrow (including construction North)
- Key plan
- Name and contact information of applicant and property owner
- Property limits including bearings and dimensions
- Existing and proposed structures and parking areas
- Easements, road widening and rights-of-way
- Adjacent street names

4.2 Development Servicing Report: Water

☐ Confirm consistency with Master Servicing Study, if available
☒ Availability of public infrastructure to service proposed development
☐ Identification of system constraints
☒ Identify boundary conditions
☒ Confirmation of adequate domestic supply and pressure
☒ Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow at locations throughout the development.
☐ Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves.
☐ Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design
☐ Address reliability requirements such as appropriate location of shut-off valves
☐ Check on the necessity of a pressure zone boundary modification.
☒ Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range

- ☒ Description of the proposed water distribution network, including locations of proposed connections to the existing system, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions.
- ☐ Description of off-site required feedermains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation.
- ☒ Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines.
- ☐ Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference.

4.3 Development Servicing Report: Wastewater

- ☒ Summary of proposed design criteria (Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure).
- ☐ Confirm consistency with Master Servicing Study and/or justifications for deviations.
- ☐ Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and condition of sewers.
- ☒ Description of existing sanitary sewer available for discharge of wastewater from proposed development.
- ☒ Verify available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable)
- ☒ Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix ‘C’) format.
- ☐ Description of proposed sewer network including sewers, pumping stations, and forcemains.
- ☐ Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality).
- ☐ Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development.
- ☐ Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity.
- ☐ Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding.
- ☐ Special considerations such as contamination, corrosive environment etc.

4.4 Development Servicing Report: Stormwater Checklist

- ☐ Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property)
- ☒ Analysis of available capacity in existing public infrastructure.
- ☒ A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern.
- ☒ Water quantity control objective (e.g. controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects.
- ☐ Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements.
- ☒ Description of the stormwater management concept with facility locations and descriptions with references and supporting information.
- ☐ Set-back from private sewage disposal systems.
- ☐ Watercourse and hazard lands setbacks.
- ☐ Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed.
- ☐ Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists.
- ☒ Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).
- ☐ Identification of watercourses within the proposed development and how watercourses will be protected, or, if necessary, altered by the proposed development with applicable approvals.
- ☒ Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions.
- ☐ Any proposed diversion of drainage catchment areas from one outlet to another.
- ☐ Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities.
- ☐ If quantity control is not proposed, demonstration that downstream system has adequate capacity for the post-development flows up to and including the 100 year return period storm event.
- ☐ Identification of potential impacts to receiving watercourses
- ☐ Identification of municipal drains and related approval requirements.
- ☒ Descriptions of how the conveyance and storage capacity will be achieved for the development.
- ☒ 100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading.

- ☐ Inclusion of hydraulic analysis including hydraulic grade line elevations.
- ☒ Description of approach to erosion and sediment control during construction for the protection of receiving watercourse or drainage corridors.
- ☐ Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplain elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current conditions.
- ☐ Identification of fill constraints related to floodplain and geotechnical investigation.

4.5 Approval and Permit Requirements: Checklist

The Servicing Study shall provide a list of applicable permits and regulatory approvals necessary for the proposed development as well as the relevant issues affecting each approval. The approval and permitting shall include but not be limited to the following:

- ☐ Conservation Authority as the designated approval agency for modification of floodplain, potential impact on fish habitat, proposed works in or adjacent to a watercourse, cut/fill permits and Approval under Lakes and Rivers Improvement Act. The Conservation Authority is not the approval authority for the Lakes and Rivers Improvement Act. Where there are Conservation Authority regulations in place, approval under the Lakes and Rivers Improvement Act is not required, except in cases of dams as defined in the Act.
- ☐ Application for Certificate of Approval (CofA) under the Ontario Water Resources Act.
- ☐ Changes to Municipal Drains.
- ☐ Other permits (National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation etc.)

4.6 Conclusion Checklist

- ☒ Clearly stated conclusions and recommendations
- ☒ Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.
- ☒ All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario

Appendix C: Guidelines, Existing Reports, Studies and References

The following studies were utilized in the preparation of this report:

- **Ottawa Sewer Design Guidelines**,

  City of Ottawa, SDG002, October 2012, amended 2019 & 2020. (City Standards)

  - Technical Bulletin ISTB-2018-01, City of Ottawa, March 21, 2018.
  - Technical Bulletin ISTB-2018-03, City of Ottawa, March 21, 2018.

- **Ottawa Design Guidelines – Water Distribution**

  City of Ottawa, July 2010., (Water Supply Guidelines)

  - Technical Bulletin ISD-2010-2, City of Ottawa, December 15, 2010.
  - Technical Bulletin ISDTB-2014-02, City of Ottawa, May 27, 2014.
  - Technical Bulletin ISDTB-2018-02, City of Ottawa, March 21, 2018.

- **Design Guidelines for Sewage Works,**

  Ministry of the Environment, 2008., (MOE Design Guidelines)

- **Stormwater Planning and Design Manual,**

  Ministry of the Environment, March 2003.,(SWMP Design Manual)

- **Ontario Building Code Compendium**

  Ministry of Municipal Affairs and Housing Building Development Branch, January 1, 2010 Update.(OBC)

- **Water Supply for Public Fire Protection**

  Fire Underwriters Survey, 1999., (FUS)

- **NFPA 13 – Standard for the Installation of Sprinkler Systems**

  National Fire Protection Association, 2016., (NFPA Standards)