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June 29, 2018

City of Ottawa
Development Review - Urban Services Branch
Planning and Growth Management Department
110 Laurier Avenue West, 4th Floor
Ottawa, ON, K1P 1J1

Attention: Mélanie Gervais, Planner

Re **Riverside South Elementary School, Ottawa-Carleton District School Board**
925 Ralph Hennessy Avenue, Ottawa
Site Servicing Report

Dear Mélanie:

We provide the following Site Servicing Report in accordance with the City of Ottawa Site Plan Control Application requirements for the Conseil des écoles catholiques du Centre-Est proposed Riverside South Elementary School at 925 Ralph Hennessy Avenue, Ottawa. The purpose of the report is to confirm that existing municipal and site services, including water, storm, and sanitary, can support the demand from the proposed new building.

Reference documents

- Site Servicing Plan – C1, Grading and Drainage, Erosion and Sediment Control Plan – C2by Jp2g Consultants Inc., June 29, 2018.
- Stormwater Management Report by Jp2g Consultants Inc., June 29, 2018.
- Topographical Survey by Annis, O'Sullivan, Vollebekk Ltd., April 11, 2018, Job No. 18720-18.

Background

The proposed elementary school is to be located on an existing vacant property, at the intersection of Ralph Hennessy Avenue and Mount Nebo Way, in the Riverside South subdivision phase 13, east of Spratt Road and south of Earl Armstrong Road in Ottawa, Ontario. The total site area is approximately 2.003 ha. The proposed site development includes a new school building, a bus lay-by, a car lay-by, asphalt parking, hard surface walkways and play areas, landscaped areas, a sports field, an area for portables and a future expansion of the building.

Servicing

1.1 Storm Sewer and Stormwater Management

Uncontrolled site storm drainage for the sidewalk and boulevard areas west and north of the proposed school will be collected by the existing curb inlet catch basins along Ralph Hennessy Way and Mount Nebo Way.

Controlled site storm drainage for the roof, asphalt parking, hard surface walkways and play areas, landscaped areas, sports field, area for portables and future expansion of the building will be collected to the existing 1650 mm diameter municipal storm sewer flowing west on Mount Nebo Way with an existing 600 mm diameter storm sewer stub teeing in from the subject property, via the new 1200 mm diameter storm manhole MHST-01 with a new 525 mm diameter storm sewer service inlet connection. The site currently has an existing ditch inlet connected to the 1650 mm diameter storm sewer on Mount Nebo Way. The ditch inlet and associated pipe will be removed up to the property line and abandoned to accommodate the new development.

Stormwater quantity control will be achieved using flow restrictors for the parking area and school yard. Stormwater management calculations are included in the Stormwater Management Report prepared by Jp2g, dated June 29, 2018.

1.2 Sanitary Sewer

There is an existing 450 mm diameter sanitary sewer flowing north along Ralph Hennessy Way with an existing 200 mm diameter sanitary sewer stub teeing in from the subject property. As indicated in the Stantec Consulting Report, dated June 30, 2017, wastewater generated in Riverside South Subdivision Phase 13 will be conveyed to the existing 450 mm diameter sanitary sewer on Ralph Hennessy way and 525 mm diameter sanitary sewer on Portico Way, then northerly to the existing Rideau River crossing, and ultimately to the existing West River Collector.

A proposed 1200 mm diameter sanitary manhole MHSA-01, connected to the existing 200 mm sanitary sewer service outlet with a new 200 mm diameter sanitary sewer service inlet approximately 6.0m deep, will service the proposed building. The sanitary sewer will outlet the building at a slope of 1.0% and connect to the proposed 1200 mm diameter sanitary sewer manhole MHSA-01 which ultimately connects to existing municipal sanitary sewer as per City of Ottawa Standard Detail S11.1.

Based on the City of Ottawa Sewer Design Guidelines, the peak sanitary flow for the site was calculated to be 2.3 l/s (Refer to Appendix A - Sanitary Sewer Design Sheet). This is in accordance with the sanitary flows accounted for in the Riverside South Development Corporation – Phase 13 Sanitary Sewer Design Sheets, included Appendix A. The proposed 200mm diameter sanitary service will have a full flow capacity of 32.8 l/s, which will be sufficient to handle the proposed development sanitary flows.

1.3 Water

There is an existing 300 mm diameter watermain located on the east side of Ralph Hennessy Way, with an existing 200 mm diameter watermain service teeing in complete with an existing service valve box up to the property line of the subject property. A proposed 200mm diameter watermain will service the proposed school, and connect to the municipal watermain, in the right-of-way. The water meter will be located inside the school's mechanical room and a remote water meter will be installed along the building exterior.

The water demand for the proposed school was calculated based on Table 4.2 from the City of Ottawa Design Guidelines for Water Distribution. The calculations are based on the following criteria:

- Average daily demand for schools = 70 l/student/day
- School day = 8 hours
- Maximum school occupancy = 490 persons (staff and students)

Average Daily Demand: $\frac{70 \text{ l/student/day} \times 490 \text{ students}}{8 \text{ hrs/day} \times 3600 \text{ s/hr}} = 1.19 \text{ l/s}$

Maximum Daily Demand: 1.19 l/s x 1.5 = 1.79 l/s

Maximum Hour Demand: 1.19 l/s x 1.8 = 2.14 l/s

There is an existing fire hydrant on Ralph Hennessy Avenue located along the front of the school building which will provide fire protection to the site. The proposed building will be equipped with sprinklers and a siamese connection located at the front of the building at the southeast entrance within 20 metres of the municipal fire hydrant. Based on the Fire Underwriters Survey Method, the fire flow demand for the proposed school was calculated to be:

Fire Flow Demand: 116.7 l/s (Refer to Appendix B – Fire Flow Calculations).

The above water demand requirements were provided to the City of Ottawa for the hydraulic analysis of the boundary conditions at the proposed school location. The following Boundary Conditions, included in Appendix B, were returned:

Max. HGL = 147.8 m (head) / 78.9 psi (pressure)
PKHR = 145.6 m (head) / 75.8 psi (pressure)
MXDY+Fire = 143.9 m (head) / 73.4 psi (pressure)

According to the City of Ottawa Design Guidelines, the installation of a pressure reducing valve will be required inside the building.

End of Site Servicing Report

Please contact the undersigned should you require any clarification.

Yours truly,

Jp2g Consultants Inc.
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Roxanne Tubb, P.Eng.
Civil Engineer

Appendix A - Sanitary Sewer Design Sheet

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Appendix A - Sanitary Sewer Design Sheet

A.1.1 - Peak Flow Design Based on Site Area

Definitions

Manning's Coefficient (n) = 0.013

Manning's Formula

$Q = A*R^{2/3}*S^{1/2}/n$ (l/s), where

A = Areas in Hectares (ha)

R = Hydraulic Radius (m)

S = Slope

Design Parameters*

1) Average Daily Flow = 350 L/p/day

2) Commercial/Institutional Flow = 50,000 L/ha/day

3) Maximum Residential Peak Factor = 4

4) Commercial/Institutional Peak Factor = 1.50

5) Extraneous Flow = 0.28L/s/ha

6) Minimum Velocity = 0.76 m/s

Designed RT

Checked DN

Dwg. Reference C1

Jp2g project No 2141686A

Location		Residential Flow**							Institutional Flow			Infiltration Flow			Total Flow	Sewer Data					
					Cumulative		Peak Factor	Peak Flow	Area (ha)		Peak Flow	Area (ha)		Inf. Flow		Length	Dia.	Slope	Capacity	Velocity	Utilization
From	To	Area (ha)	Units	Population	Area	Population		(l/s)	Individual	Cumulative	(l/s)	Individual	Cumulative	(l/s)	(l/s)	(m)	(mm)	(%)	(full) (l/s)	(full) (m/s)	(%)
School	MHSA-01	0.00	0	0	0.00	0	4.00	0.00	2.003	2.003	1.74	2.003	2.003	0.56	2.30	8.3	200	1.0	32.8	1.0	7.0
MHSA-01	Ex. 450mm San. Sewer	0.00	0	0	0.00	0	4.00	0.00	0.000	2.003	1.74	0.000	2.003	0.56	2.30	13.2	200	1.0	32.8	1.0	7.0

A.1.2 - Peak Flow Design Based on Design Population

Design Parameters*

1) Average Daily Sewage Flow for day school with cafetria or gym and showers = 70 L/person/day

2) Institutional Peak Factor = 1.50

Type of Establishment	Population	Average Daily Flow***	Infiltration Flow			Total Flow	Sewer Data					
			Area (ha)		Inf. Flow		Length	Dia.	Slope	Capacity	Velocity	Utilization
		(l/s)	Individual	Cumulative	(l/s)	(l/s)	(m)	(mm)	(%)	(full) (l/s)	(full) (m/s)	(%)
School	412	1.50	2.003	2.003	0.56	2.06	8.3	200	1.0	32.8	1.5	6.3

* City of Ottawa Sewer Design Guidelines, Section 4 - Sanitary Sewer Systems

**Residential flow data from Half Moon Bay Subdivision, Phase 1, 2, 3, 5, 6, sanitary sewer calculation sheets by DSEL, dated August 2010.

***Calculated based on an 8-hour school day.

Appendix B - Fire Flow Calculations

Appendix C - Fire Flow Demand Requirements (Fire Underwritters Survey (FUS Guidelines))

Riverside South Elementary School, 925 Ralph Hennessy Avenue, Ottawa, ON

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Appendix C - Water Demand

C.1.1 - Fire Flow Demand Requirements

Design Parameters*

Estimated Fire Flow Formula: $F=220*C*A^{1/2}$(L/min)

F = Required fire flow (L/min)
C = Coefficient related to the type of construction
$C_{1.5}$ = 1.5 for wood frame construction
$C_{1.0}$ = 1.0 for ordinary construction
$C_{0.8}$ = 0.8 for non-combustible construction
$C_{0.6}$ = 0.6 for fire-resistive construction
A = Total floor area in square metres

Adjustments to the calculated fire flow are based on: reduction for low fire hazard occupancy (school), reduction for automatic sprinkler protection, and an increase for exposures for residences within 45 metres on two sides of the school.
The table below summarizes the adjustments made to the basic fire flow.

Exposure Adjustment Calcualtion		
Separation Distance		32.0
Length*Height factor of exposed wall	=42m*2 storeys	84.0
Construction of exposed wall	Wood frame or non-combustible	5%

				Adjustments (increases or decreases)							
Building Construction	Floor Area***	C	1	2		3		4		Final Adjusted Fire Flow	Final Adjusted Fire Flow
			Fire Flow (F)	Occupancy		Sprinkler**		Exposure***			
non-combustible construction	(m^2)		(L/min)	%	Adjusted Fire Flow(s) (L/min)	%	Adjusted Fire Flow(s) (L/min)	%	Adjusted Fire Flow(s) (L/min)	(L/min)	(L/s)
	4,257.0	0.8	11,000.0	0.0	11,000.0	30%	3,300.0	5%	550.0	7,000.0	116.7

*Water Supply for Public Protection (Fire Underwriters Survey, 1999).
**The building is partially sprinklered, but not monitored.
***Including all stories

C.1.2 - Existing Water Boundary Conditions

Water Demands

Average Daily Demand:	1.00 l/s
Maximum Daily Demand:	1.50 l/s
Maximum Hour Demand:	1.80 l/s
Fire Flow Demand:	116.67 l/s
Maximum Daily + Fire Flow Demand:	118.17 l/s

Design Parameters

Pipe Diameter:	200 mm
Pipe Material:	PVC
Pipe Length	58.0 m
Finished Floor Elevation:	93.75
Pavement (R.O.W.) Elevation:	93.30

Boundary Conditions

Max. HGL:	147.8 m
Min HGL:	145.6 m
Max. Day + Fire:	143.9 m

Boundary Condition Check

Check water pressure at municipal connection:

Min. HGL - Pavement elevation = 52.30 m

= 74.37 psi*
= 512.76 kPa*

*Normal operating pressure ranges between 345 kPa (50 psi) and 552 kPa (80 psi) under a condition of maximum daily flow as per City of Ottawa Design Guidelines - Water Distribution (Section 4.2.2)

Pressure at municipal connection OK

Check water pressure at building connection (at max. hour demand):

Min. HGL - Finished floor elevation - Friction Loss** = 51.84 m
= 73.72 psi***
= 508.28 kPa***

**Friction loss calculated using the Hazen-Williams Equation

***Under maximum hourly demand conditions the pressures shall not be less than 276 kPa (40 psi) as per City of Ottawa Design Guidelines - Water Distribution (Section 4.2.2)

Pressure at building connection (at max. hour demand) OK

Check water pressure at building connection (at max. day + fire demand):

Min. HGL - Finished floor elevation - Friction Loss** = 47.02 m
= 66.86 psi****
= 461.00 kPa****

**Friction loss calculated using the Hazen-Williams Equation

****Under maximum day and fire flow demand conditions the residual pressure at any point in the system shall not be less than 140 kPa (20 psi) as per City of Ottawa Design Guidelines - Water Distribution (Section 4.2.2)

Pressure at municipal connection (at max. day + fire demand) OK