September 25, 2024 File: 24097

Attention: Tammie Brakele
The Children's Place

310 Legget Drive
Kanata, ON K2K 1Y6

Re: Assessment of Adequacy of Public Services (AAPS)
Day Care Facilities
16 Anna Avenue and 1160 Carling Avenue, City of Ottawa

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1. Introduction

PEARSON Engineering (Pearson) has been retained to complete a Servicing Brief for the proposed day care facilities (Project) located at 16 Anna Avenue and 1160 Carling Avenue in the City of Ottawa (City). The property for 16 Anna Avenue is approximately 0.04 ha in size and currently consists of a single-family dwelling, with a driveway fronting Anna Avenue. The project site is bound by existing single-family dwellings to the south, existing commercial units to the north and west, and Anna Avenue to the east. 1160 Carling Avenue is approximately 0.07 ha in size and is currently used for Day Care Facilities which is located at the intersection of Carling Avenue and Anna Avenue.

The project proposes the expansion of day care facility and changes of the building usage at 16 Anna Avenue, from residential to commercial (day care facility), which will accommodate 10 children and 3 adult staff members.

2. Water Supply

The proposed building at 16 Anna Avenue is currently serviced by an existing water service lateral which is connected to the 150 mm watermain on Anna Avenue. Under existing conditions, utilizing the City of Ottawa's Water Distribution Design Guidelines and the latest technical bulletins, an average water consumption of 280 L/day/person, and a design population of 3.4 people/unit for single family dwelling were used in calculating an average daily demand (ADD) of 0.01 L/s. A Peak Rate Factor of 14.3 was used to calculate a Peak Hour Demand (PHD) of 1.65 L/s for the project site. Detailed calculations are attached to this brief.

Under proposed conditions, an average water consumption of 28,000 L/ha/day was used for commercial land use to calculate an average daily demand of 0.01 L/s. A Peak Rate Factor of 1.80 was used in calculating PHD of 0.04 L/s. As the proposed building usage will result in a decrease in peak flow, no adverse effects are expected for the development.

Fire flow calculations were completed as per the Fire Underwrite Survey (FUS) for the existing conditions, which resulted in a required fire flow of 83 L/s (5,000 L/min). Under proposed conditions, no alterations to the building footprint are proposed, as such, required fire flow remains the same for the proposed change of use.

Water demand calculations under existing conditions for 1160 Carling Avenue were completed using the same parameters as 16 Anna Avenue, resulting in an average daily demand (ADD) of 0.01 L/s and a Peak Hour Demand (PHD) of 1.65 L/s. Under the proposed conditions an ADD of 0.02 L/s and a PHD of 0.06 L/s were calculated. As shown in calculations attached to this brief, the proposed usage will result in a decrease in the peak flow. As such, no adverse effects are expected for 1160 Carling Avenue. FUS calculations were also completed for 1160 Carling Avenue and resulted in a required fire flow of 67 L/s (6,000 L/min). As the building on 1160 Carling Avenue is already constructed and no alteration to building footprint is proposed, required fire flow remains the same for the property.

The boundary conditions for the site were provided by the City of Ottawa using the project's domestic and fire flow demands. Water pressures shown in Table 1 and Table 2 were calculated based on the Hydraulic Grade Line (HGL) provided by the City for the project site and 1160 Carling Avenue. When comparing the minimum and maximum allowable water pressure from City of Ottawa Water Design Guidelines, it can be seen that the site water pressures fall within the City limits for the proposed conditions for the average day demand and peak hour demand for both the project site and 1160 Carling Avenue.

Based on email correspondence with City staff, it was noted that a maximum fire flow of 26.5 L/s is available at a pressure of 20 psi, which is less than the required fire flow of 83 L/s for the project site and 67 L/s for 1160 Carling Avenue. Since the building footprint has not been changed, no fire flow improvements have been proposed for the project.

It is assumed that the boundary conditions and an HGL were derived from the City water model. The boundary conditions indicate the maximum available fire flow is 26.5 L/s. There is an existing AA class hydrant located to the east side of Anna Avenue, which provides a flow rate of 1,500 GPM as per the City of Ottawa design guidelines. As the building footprint remains unchanged, fire flow improvements have not been proposed for the project. Detailed fire flow analysis, water pressure conversion and boundary conditions supplied by the City for both existing and future conditions are attached to this brief.

Table 1: Boundary Conditions (16 Anna Avenue)

Design Parameter	Demand (L/s)	HGL (m)	Pressure (PSI)	Pressure (kPa)	City of Ottawa minimum (kPa)	City of Ottawa maximum (kPa)
Average Daily Demand	0.01	132.8	75.1	517.7	140	552
Peak Hour Demand	0.04	124.2	62.9	433.4	140	552
Fire Flow (Available)	26.5	-	20	140.0	140	552

Table 2: Boundary Conditions (1160 Carling Avenue)

Design Parameter	Demand (L/s)	HGL (m)	Pressure (PSI)	Pressure (kPa)	City of Ottawa minimum (kPa)	City of Ottawa maximum (kPa)
Average Daily Demand	0.02	132.8	75.1	517.7	140	552
Peak Hour Demand	0.06	124.1	62.7	432.4	140	552
Fire Flow (Available)	26.5	-	20	140.0	140	552

3. Sanitary Servicing

The site is currently serviced by an existing sanitary lateral connected to the existing 225 mm diameter combined sewer on Anna Avenue. Utilizing the City of Ottawa's Sewer Design Guidelines and latest technical bulletins, an average water consumption of 280 L/person/day for residential land use and a design population of 3.4 people/unit were used in calculating an Average Daily Flow (ADF) of 0.01 L/s. Using a Peak Rate Factor of 3.76 and infiltration allowance of 0.33 L/ha/day, a peak flow of 0.06 L/s was calculated. Under proposed conditions, utilizing an average daily flow of 28,000 L/ha/day, an ADF of 0.01 L/s was calculated. A peak flow of 0.03 L/s was calculated using a Peak Rate Factor of 1.50. As the proposed building usage will result in a decrease in peak flow, no adverse effects are expected for the development.

Sanitary flow calculations for 1160 Carling Avenue were completed at the request of City staff. The calculations attached to this brief, show that using the same parameters used for 16 Anna Avenue, the existing conditions resulted in an Average Daily Flow (ADF) of 0.01 L/s and a peak flow of 0.07 L/s. Under proposed conditions, an ADF of 0.02 L/s and a peak flow of 0.05 L/s was calculated

The existing combined sewer runs north to south on Anna Avenue and has a capacity of 63.5 L/s at a slope of 2.0%. The proposed peak flow is 0.05% of the existing capacity and is less than the flows of existing conditions. Therefore, no adverse effects to the existing combined sewer on Anna Avenue are expected.

4. Conclusion

Both 16 Anna Avenue and 1160 Carling Avenue will have a decrease in water and sanitary peak flows, as such, existing water and sanitary services are adequate to service the existing building with proposed usage.

As the building footprint and required fire flow remains unchanged, no fire flow improvements have been proposed for the development.

We trust the enclosed is sufficient for your review. However, if you have any questions or require any additional information, please feel free to give me a call at (705) 719-4785, ext. 223.

Regards,

Pearson Engineering Ltd.

Nikhil Parmar E.I.T.
Engineering Designer

Taylor Arkell, P.Eng.
Senior Project Manager/Engineer

16 Anna Street, Ottawa
Water Flow Calculations (Existing Conditions)

Design Criteria:

Average Water Consumption Rate (Q):	280	L/cap/d
Max. Daily Factor:	9.50	(From Table 3-3 of MECP Design
Max. Hour Factor:	14.30	Guidelines for Drinking Water System)

Site Data:

Description	Density	Unit	Site Area	Flow Rate	Peaking Factors	
Residential	3.4 ppu	1	0.04 ha	280 L/person/d	Max Daily Factor*	9.50
					Max Hour Factor*	14.30
					*From Table 3-3 of MECP Design Guidelines for Drinking Water Systems	

Calculate Population

Pop. Residential	=	3.4	x	1
Pop. Total	=	4		

Calculate Average Day Demand:

ADD	=	280	x	4
ADD	=	1,047	L/day	
ADD	=	0.01	L/s	

Calculate Max Daily Flow

MDF	=	0.01	x	9.50
MDF	=	0.12	L/s	

Calculate Max Hour Demand

PHD	=	0.12	x	14.30
PHD	**=**	**1.65**	**L/s**	

16 Anna Street, Ottawa
Water Flow Calculations (Proposed Conditions)

Design Criteria:

Average Water Consumption Rate (Q)	28,000	L/ha/d
Max. Daily Factor:	1.50	(From, Table 4.2, Ottawa Design
Max. Hour Factor:	1.80	Guidelines for Water DIstribution)

Site Data:

Description	Site Area	Site Area	Flow Rate	Peaking Factors	
Commercial	445 m^2	0.04 ha	28,000 L/ha/d	Max Daily Factor*	1.50
				Max Hour Factor*	1.80
				*From Ottawa Design Guidelines based on Commercial Land Use	

Calculate Average Day Demand:

ADD	=	28,000	x	0.04
ADD	=	1,246	L/day	
ADD	=	0.01	L/s	

Calculate Max Daily Flow

MDF	=	0.01	x	1.50
MDF	=	0.02	L/s	

Calculate Max Hour Demand

PHD	=	0.02	x	1.80
PHD	**=**	**0.04**	**L/s**	

16 Anna Street, Ottawa
Sanitary Flow Calculations (Existing Conditions)

Design Criteria

Demand per Capita (Q):	280 L/cap/day	
Peak Flow (Q_p):	$Q_p = P * Q * M / 86{,}400 + I * A$	
Peaking Factor (Harmon Formula):	$M = 1 + (14 / (4 + (P / 1000)^{0.5})) \times K$	Where: 2 <= M <= 4
Correction Factor (K):	0.8	

Infiltration Allowance (I_A): 0.33 L/ha/s

Site Data

Description	Density	Units	Site Area	Flow Rate
Residential	3.4 ppu	1	0.04 ha	280 L/cap/d

Calculate Population

Pop.	=	3.40	x	1	
Pop.	=	4	people		

Calculate Average Daily Flows

ADF (L/s)	=	280	x	4	
ADF (L/s)	=	1,047	L/day		
ADF (L/s)	=	0.01	L/s		

Calculate Peaking Factor

M = $1 + \dfrac{14}{4 + \left(\dfrac{4}{1{,}000}\right)^{0.5}} \times 0.8$

M = 3.76

Use Max Peaking Factor 4.00

Calculate Peak Flow

Q_p	=	0.01	x	3.76	
	=	0.05	L/s		
Infiltration Allowance (I_A)	=	0.33	x	0.04	
	=	0.01	L/s		
Q_p (Inc. Infiltration Allowance)	=	0.05	+	0.01	
	=	0.06	L/s		

16 Anna Street, Ottawa
Sanitary Flow Calculations (Proposed Conditions)

Design Criteria

Average Water Consumption Rate (Q):	28,000	L/ha/d
Peak Flow (Q_p):	Qp = P * Q * M / 86,400	
Peaking Factor (M):	1.50	(From Ottawa Design Guidelines based on Commercial Land Use for the contributing area >20%)
Infiltration Allowance (I_A):	0.33	L/ha/s

Site Data

Description		Density	Unit	Site Area	Flow Rate	
Commercial	-	-	-	0.04 ha	28,000	L/ha/d

Calculate Average Daily Flow:

ADF	=	28,000	x	0.04	
			86,400		
ADF	=	0.01	L/s		

Calculate Peak Flow:

Qp	=	0.01	x	1.50
	=	0.02	L/s	

Infiltration Allowance (I_A):	=	0.33	x	0.04
	=	0.01		

Calculate Peak Flow (with Infiltration Allow

Qp (Inc. Infiltration Allowance I_A)	=	0.01	+	0.02
	=	0.03	L/s	

1160 Carling Ave, Ottawa
Water Flow Calculations (Existing Conditions)

Design Criteria:

Average Water Consumption Rate (Q):	280	L/cap/d
Max. Daily Factor:	9.50	(From Table 3-3 of MECP Design
Max. Hour Factor:	14.30	Guidelines for Drinking Water System)

Site Data:

Description	Density	Unit	Site Area	Flow Rate	Peaking Factors	
Residential	3.4 ppu	1	0.07 ha	280 L/person/d	Max Daily Factor*	9.50
					Max Hour Factor*	14.30
					*From Table 3-3 of MECP Design Guidelines for Drinking Water Systems	

Calculate Population

Pop. Residential	=	3.4	x	1
Pop. Total	=	4		

Calculate Average Day Demand:

ADD	=	280	x	4
ADD	=	1,047	L/day	
ADD	=	0.01	L/s	

Calculate Max Daily Flow

MDF	=	0.01	x	9.50
MDF	=	0.12	L/s	

Calculate Max Hour Demand

PHD	=	0.12	x	14.30
PHD	**=**	**1.65**	**L/s**	

1160 Carling Ave, Ottawa
Water Flow Calculations (Proposed Conditions)

Design Criteria:

Average Water Consumption Rate (Q)	28,000	L/ha/d
Max. Daily Factor:	1.50	(From, Table 4.2, Ottawa Design
Max. Hour Factor:	1.80	Guidelines for Water DIstribution)

Site Data:

Description	Site Area	Site Area	Flow Rate	Peaking Factors	
Commercial	652 m^2	0.07 ha	28,000 L/ha/d	Max Daily Factor*	1.50
				Max Hour Factor*	1.80
				*From Ottawa Design Guidelines based on Commercial Land Use	

Calculate Average Day Demand:

ADD	=	28,000	x	0.07
ADD	=	1,826	L/day	
ADD	=	0.02	L/s	

Calculate Max Daily Flow

MDF	=	0.02	x	1.50
MDF	=	0.03	L/s	

Calculate Max Hour Demand

PHD	=	0.03	x	1.80
PHD	**=**	**0.06**	**L/s**	

1160 Carling Avenue
Sanitary Flow Calculations (Existing Conditions)

Design Criteria

Demand per Capita (Q):	280 L/cap/day	
Peak Flow (Q_p):	$Q_p = P * Q * M / 86{,}400 + I * A$	
Peaking Factor (Harmon Formula):	$M = 1 + (14 / (4 + (P / 1000)^{0.5})) \times K$	Where: 2 <= M <= 4
Correction Factor (K):	0.8	

Infiltration Allowance (I_A): 0.33 L/ha/s

Site Data

Description	Density		Units	Site Area	Flow Rate	
Residential	3.4	ppu	1	0.07 ha	280	L/cap/d

Calculate Population

Pop.	=	3.40	x	1		
Pop.	=	4	people			

Calculate Average Daily Flows

ADF (L/s)	=	280	x	4		
ADF (L/s)	=	1,047	L/day			
ADF (L/s)	=	0.01	L/s			

Calculate Peaking Factor

M	=	1	+	14			x	0.8		
				4	+	$\left(\frac{4}{1{,}000}\right)^{0.5}$				
M	=	3.76								
		Use Max Peaking Factor 4.00								

Calculate Peak Flow

Q_p	=	0.01	x	3.76		
	=	0.05	L/s			
Infiltration Allowance (I_A)	=	0.33	x	0.07		
	=	0.02	L/s			
Q_p (Inc. Infiltration Allowance)	=	0.05	+	0.02		
	=	0.07	L/s			

1160 Carling Avenue
Sanitary Flow Calculations (Proposed Conditions)

Design Criteria

Average Water Consumption Rate (Q):	28,000	L/ha/d
Peak Flow (Q_p):	Qp = P * Q * M / 86,400	
Peaking Factor (M):	1.50	(From Ottawa Design Guidelines based on Commercial Land Use for the contributing area >20%)
Infiltration Allowance (I_A):	0.33	L/ha/s

Site Data

Description		Density	Unit	Site Area	Flow Rate	
Commercial	-	-	-	0.07 ha	28,000	L/ha/d

Calculate Average Daily Flow:

ADF	=	28,000	x	0.07	
			86,400		
ADF	=	0.02	L/s		

Calculate Peak Flow:

Qp	=	0.02	x	1.50
	=	0.03	L/s	

Infiltration Allowance (I_A):	=	0.33	x	0.07
	=	0.02		

Calculate Peak Flow (with Infiltration Allow

Qp (Inc. Infiltration Allowance I_A)	=	0.02	+	0.03
	=	0.05	L/s	

PEARSON ENGINEERING

16 Anna Avenue, Ottawa
Fire Flow Calculations

Required fire flow calculations as per the Fire Underwritors Survey's Water Supply for Public Fire Protection - 2020:

Location:	16 Anna Avenue, Ottawa
OBC Occupancy:	B-3 (Care Occupancies)
Building Foot Print:	140 m²
# of Stories:	1

Date: 2024-09-24
Project: The Children's Place
Project Number: 24097

Type	Construction Class	Charge
5	Wood Frame	1.50
4	Heavy Timber (A-D)	0.80 - 1.50
3	Ordinary	1.00
2	Non-Combustible	0.80
1	Fire Resistive	0.60

Construction Class: Type 5 — Wood Frame

Automated Sprinkler Protection:		**Credit**	**Total**
NFPA 13 sprinkler standard	No	0%	0%
Standard Water Supply	No	0%	
Fully Supervised System	No	0%	

Contents	Charge
Non-Combustible	-25%
Limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Burning	25%

Contents Factor: Limited Combustible — **Charge:** -15%

Exposure Side & Building	Length - Height Ratio	Distance to Exposure Building (m)	Charge
North Ex. Day care facility	34.0	10.4	11%
East Ex. Residential	39.6	24.5	2%
South Ex. Residential	66.8	2.2	23%
West Ex. Commercial	45.6	22.1	4%
		Total:	**40%**

Separation Distance	Charge
0.0 - 3.0 m	15% -20%
3.1 - 10.0 m	10% - 15%
10.1 - 20.0 m	5% - 10%
20.1 - 30.0 m	0% - 5%
> 30.1 m	0%

Note: As per FUS 2020 Table 6, Charges for Type V were used for Ordinary construction class.

Are Buildings Contigious? No

Fire Resistant Building: Are vertical openings and exterior vertical communications protected with a minimum one (1) hr rating? No

Calculations: *C* = 1.50 — Wood Frame

Required Fire Flow: ***RFF = 220 x C x √A***

Where: *RFF* = required fire flow in liters per minute
C = Coefficient related to the type of construction
A = the total effective area in square meters for Construction Coefficient from 1.0 to 1.5 (excluding basements in building considered).
Note: 100% of all floor area were considered to determine the effective area.

Total Effective Area:

A = Single Largest Floor + 100% of Adjoining Floors

A = 140 + 0

A = 140 m²

RFF = 3,905 L/min

Round to Nearest 1000 L/min: RFF = 4,000 L/min

* Must be > 2,000 L/min or < 45,000 L/min

Correction Factors:

Contents Charge		-600	L/min
RFF Adjusted for Contents	**E =**	3,400	L/min
Reduction For Sprinkler	**F =**	0	L/min
RFF w/ Sprinkler Reduction		3,400	L/min
Exposure Charge	**G =**	1,360	L/min
RFF w/ Exposure Charge		4,760	L/min

As per "Water Supply for Public Fire Protection" pg.20 note H:
RFF = **E - F + G**

RFF = 3400 L/min - 0 L/min + 1360 L/min
RFF = 4760 L/min

Required Fire Flow: **RFF =** 4,760 L/min

Round to Nearest 1,000 L/min

RFF =	**5,000**	**L/min**
RFF=	**1,320**	**GPM**
RFF =	**83**	**L/s**

PEARSON ENGINEERING

1160 Anna Avenue, Ottawa
Fire Flow Calculations

Required fire flow calculations as per the Fire Underwritors Survey's Water Supply for Public Fire Protection - 2020:

Location:	1160 Carling Ave, Ontario
OBC Occupancy:	B-3 (Care Occupancies)
Building Foot Print:	140 m²
# of Stories:	1

Date: 2024-09-24
Project: The Children's Place
Project Number: 24097

Type	Construction Class	Charge
5	Wood Frame	1.50
4	Heavy Timber (A-D)	0.80 - 1.50
3	Ordinary	1.00
2	Non-Combustible	0.80
1	Fire Resistive	0.60

Construction Class: Type 5 — Wood Frame

Automated Sprinkler Protection:		**Credit**	**Total**
NFPA 13 sprinkler standard	No	0%	0%
Standard Water Supply	No	0%	
Fully Supervised System	No	0%	

Contents	Charge
Non-Combustible	-25%
Limited Combustible	-15%
Combustible	0%
Free Burning	15%
Rapid Burning	25%

Contents Factor: Limited Combustible — **Charge:** -15%

Exposure Side & Building	Length - Height Ratio	Distance to Exposure Building (m)	Charge
North Ex. Day care facility	>100	>30	0%
East Ex. Residential	>100	>30	0%
South Ex. Residential	58.7	10.4	11%
West Ex. Commercial	>100	>30	0%
		Total:	**11%**

Separation Distance	Charge
0.0 - 3.0 m	15% -20%
3.1 - 10.0 m	10% - 15%
10.1 - 20.0 m	5% - 10%
20.1 - 30.0 m	0% - 5%
> 30.1 m	0%

Note: As per FUS 2020 Table 6, Charges for Type V were used for Ordinary construction class.

Are Buildings Contigious? No

Fire Resistant Building: Are vertical openings and exterior vertical communications protected with a minimum one (1) hr rating? No

Calculations: *C* = 1.50 — Wood Frame

Required Fire Flow: $RFF = 220 \times C \times \sqrt{A}$

Where: *RFF* = required fire flow in liters per minute
C = Coefficient related to the type of construction
A = the total effective area in square meters for Construction Coefficient from 1.0 to 1.5 (excluding basements in building considered).
Note: 100% of all floor area were considered to determine the effective area.

Total Effective Area:

A = Single Largest Floor + 100% of Adjoining Floors

A = 140 + 0

A = 140 m²

RFF = 3,905 L/min

Round to Nearest 1000 L/min: RFF = 4,000 L/min

* Must be > 2,000 L/min or < 45,000 L/min

Correction Factors:

Contents Charge		-600	L/min
RFF Adjusted for Contents	**E =**	3,400	L/min
Reduction For Sprinkler	**F =**	0	L/min
RFF w/ Sprinkler Reduction		3,400	L/min
Exposure Charge	**G =**	374	L/min
RFF w/ Exposure Charge		3,774	L/min

Required Fire Flow: **RFF =** 3,774 L/min

Round to Nearest 1,000 L/min

RFF =	**4,000**	**L/min**
RFF=	**1,056**	**GPM**
RFF =	**67**	**L/s**

As per "Water Supply for Public Fire Protection" pg.20 note H:
RFF **= E - F + G**

RFF = 3400 L/min - 0 L/min + 374 L/min
RFF = 3774 L/min

16 Anna Street, Ottawa
Boundary Conditions Unit Conversion

Project: Children Care Facility

Project Number: 24097

Street: Anna Avenue **Ground Elev (m):** 80

	Height (m)	m H_2O	PSI	kPa
Avg. Day	132.8	52.8	75.1	517.7
Peak Hour	124.2	44.2	62.9	433.4
Fire Flow	94.1	14.1	20.0	140.0

Note:

The above info was provided by the City of Ottawa.

1160 Carling Avenue
Boundary Conditions Unit Conversion

Project: Children Care Facility

Project Number: 24097

Street: Anna Avenue

Ground Elev (m): 80

	Height (m)	m H_2O	PSI	kPa
Avg. Day	132.8	52.8	75.1	517.7
Peak Hour	124.1	44.1	62.7	432.4
Fire Flow	94.1	14.1	20.0	140.0

Note:

The above info was provided by the City of Ottawa.