Corporation of the County of Lanark

MUNICIPALITY OF MISSISSIPPI MILLS

***

PRELIMINARY SITE SERVICING REPORT

PROJECT: MENZIE ENCLAVES SUBDIVISION

ADDRESS:

ADELAIDE ST / MENZIE ST

MUNICIPALITY OF MISSISSIPPI MILLS, ON

PREPARED FOR:
13165647 Canada Inc

27 Queen Street East . #407,

Toronto, ON,

M5C 2M6

PREPARED BY:
Advance Engineering Ltd. Ottawa, ON
(613) 986 9170

Date	*Revision / Issue*
January 31, 2023	Issued for a Subdivision Draft Plan Application

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1.0 INTRODUCTION

13165647 Canada Inc. has retained *Advance Engineering Ltd.* to provide a site servicing study for the proposed residential subdivision of 50 semi-detached and 5 single detached lots. The report describes the existing infrastructure in the immediate area and estimates the servicing requirements for the proposed development. It examines the adequacy of existing sanitary, water and stormwater infrastructure to accommodate all flows and demands associated with the proposed development. The report also provides information and assumptions used in the design of the sanitary sewer and watermain and should be read in conjunction with the design drawings prepared by *Advance Engineering Ltd.*.The report is prepared in support of an application for a subdivision draft plan approval by the applicant.

1.1 SITE DESCRIPTION

The proposed development is on a single parcel of land. It is located at the south west corner of unopened Adelaide St and Menzie St intersection in the north side of Mississippi Mills, Ontario (Figure-1, **Appendix A**). The legal description of the subject property *is: "Lot 15, Mclean Section, Plan 6262, Henderson Section, Block C Park Lot 2, Plan 6262 Town of Mississippi Mills".* The site is bounded as follows:

- Adelaide St (unopened) and a future development (Hannan Hills) to the north,
- *Spring Creek* and Menzie St (unopened) to the east,
- Augusta St (unopened) and *Spring Creek* to the south, and,
- residential dwellings and McDermott St beyond to the west.

The subject property is approximately 2.8426 hectares (7.02 acres) with a rectangular shape of 185 m in length and 155 m in width. The site is currently vacant and covered with trees and grass. The property is not currently serviced by municipal water, sanitary or storm sewers.

1.2 BACKGROUND AND LAND USE

The site has never been developed. Under the Comprehensive Zoning By-Law #11-83, consolidated March 10, 2020, a zoning amendment is required to change the zoning type of the site from "D" to proposed "R1" and "R2".

The site has been surveyed by *Annis, O'Sullivan, Vollebekk Ltd.,* Job No.: 22733-22, field work completed October 31, 2022.

The following documents have been provided by the Municipality and the Owner:

1- "*Hannan Hills, Serviceability and Conceptual Stormwater Management Report*" dated May 20, 2021, by *Novatech.* File: 118201, Ref: R-2021-010.

2- *Master Plan Update Report* prepared by *J.L.Richards* for the Municipality of Mississippi Mills, dated February 2018, JLR No.: 27456-01

1.3 PROPOSED DEVELOPMENT AND PHASING

The proposed subdivision, as shown in the Draft Plan of Subdivision, includes semi-detached lots with attached garages with areas not less than 225 m^2 and frontages not less than 7.5 m for each dwelling unit and single detached lots with areas not less than 360 m^2 and lot frontages not less than 12 m. In addition to the residential lots, one block for stormwater management (Block 28) and two blocks for road widening along Adelaide and Augusta have been proposed.

The development includes the construction of paved roadways, sanitary and storm sewers, watermains and other utilities (gas, Bell and Hydro) to service the proposed 55 lots. The project will be completed in one phase.

ROADWAY DESIGN

The subdivision has two road intersections with Adelaide St to the north. A 4 m wide pedestrian pathway is planned between internal Street A and Menzie St.

Proposed streets A and B will be constructed as per the typical road cross-section shown in the Draft Plan. The proposed 18-metre right-of-way will have 8.5-metre asphalt pavement and mountable curbs. A sidewalk will be constructed on one side of the subdivision streets.

As per the geotechnical report, roadway pavement structure shall consist of (from top to bottom):

- 40 mm HL3 or Superpave 12.5 asphaltic concrete wear course
- 50 mm HL8 or Superpave 19.0 asphaltic concrete wear course
- 150 mm base (OPSS Granular A crushed stone)
- 300 mm subbase (OPSS Granular B – Type II crushed stone)

  Total thickness of 690 mm.

The subgrade will be either fill or in-situ soil or OPSS granular B type II placed over in-situ soil.

1.4 EXISTING INFRASTRUCTURE

1.4.1 WATER

Existing municipal watermain:

There is no watermain in the immediate area of the site. The preliminary servicing plan for *Hannan Hills* development shows a proposed 250 mm diameter watermain running east-west within the north side of Adelaide St. It will connect to the existing 250 mm diameter watermain identified at Honeyborne St across the creek and Menzie St.

Available Capacities:

The Municipality and its consultant will examine the available capacity based on anticipated water demand for both developments in the area.

1.4.2 WASTEWATER

Existing municipal sewer: There is no sanitary sewer in the immediate area of the site. There are existing sanitary sewers at Maude St to the south of the site and at Finner Court to the west of the site.

The preliminary servicing plan for Hannan Hills shows a proposed 200 mm diameter pipe running east to west along Adelaide St and connected to a proposed 300 mm diameter sewer running north to south along Florence St. The invert at the outlet manhole at Victoria St / Florence St is assumed at 134.9.

The two proposed manholes at Adelaide St intersections with Street A and Street B have invert elevations of 137.44 and 136.84 and grate elevations of 140.05 and 140.15 approximately.

Available Capacities:

Figure 25 of the Master Plan shows a committed capacity of **5.97 L/s** in the coming 5-10 years for *Victoria and Menzie Residential infill,* which includes the proposed subdivision and *Hannan Hills* development.

1.4.3 STORMWATER

The site is located in the sub-watershed of *Spring Creek*. There is no storm water sewer in the immediate area of the subdivision. There are existing detention ponds in the area that outlet into the creek.

Utility service connections to the developed site will be coordinated with the appropriate utility companies prior to construction.

2.0 WATER SERVICING

2.1 DESIGN CRITERIA

The water demand for the proposed development has been calculated based on *Ottawa Design Guidelines - Water Distribution* and subsequent technical bulletins as follows:

- Population: 152 person (residential occupancy for single family dwelling 3.4 person per unit and for semi-detached 2.7 person per unit)
- Average daily demand per capita per day = 280 L/pers./day (as per latest Technical Bulletins)
- Peaking factor for maximum daily demand = 4.9
- Peaking factor for peak hourly demand = 7.4

  Peaking factor are provided by interpolation from Table 3-3 of the MOECP "*Design Guidelines for Drinking-Water Systems",* used for water systems serving fewer than 500 people.
- Required fire flow demand: calculated as per the Ontario Building Code (OBC), A-3.2.5.7 Division B, Building Code Compendium, and cross-referenced with the Fire Underwriter's Survey (FUS-1999).
- System pressures requirements:

Pressure Check	Minimum Pressure		Maximum Pressure	
	(kPa)	(psi)	(kPa)	(psi)
Normal Use	345	50	552	80
Peak Hour Demand	276	40	552	80
Maximum Day and Fire Flow	140	20	552	80
Maximum pressure at any point in occupied areas			552	80
Maximum pressure at any point in unoccupied areas			689	100

Table -1 System Pressure Requirements

- Proposed Watermain:

  150 mm diameter PVC Class 150 DR 18 – Roughness Coefficient = 100

  200 mm diameter PVC Class 150 DR 18 – Roughness Coefficient = 110

2.2 PROPOSED SERVICING AND CALCULATIONS

2.2.1 DOMESTIC WATER DEMAND

Domestic water demands are summarized as follows (Refer to **Appendix B** for full calculations):

Design Parameter	Value
Population in capita	152.0
Residential Average Demand Volume Per Capita in L/c/day	280
Average Demand Volume in m^3/day	42.6
Maximum Daily Demand (**4.9** x Average) in m^3/day **	208.5
Maximum Hourly Demand (**7.4** x Average Daily) in m^3/day **	314.9
Maximum Hourly Water Flow Required in L/s	**3.65**

Table -2 Anticipated Domestic Water Demand

2.2.2 FIRE FLOW DEMAND

To assess the fire flow requirements for the proposed subdivision, both the Ontario Building Code (OBC) and the Fire Underwriters Survey (FUS) have been used.

1- Ontario Building Code (OBC), A-3.2.5.7 Division B, Building Code Compendium:

Minimum water supply required in Litres: $Q = K.V.S_{tot}$ where:

Q: minimum water supply in litres
K: water supply coefficient from Table 1
V: total building volume in cubic metres
S_{tot}: total of spatial coefficient values from property line exposures on all sides as obtained from the formula: $S_{tot} = 1 + (S_{side1} + S_{side2} + S_{side3} + \text{... etc.})$; S_{tot} need not exceed 2.0.

A minimum of water supply flow rate for firefighting shall be 2 700 L/min.

2- Required Basic Fire Flow (FUS 1999 – PART II. 1): $F = 220\ C\ A^{0.5}$ where

F: required fire flow in litres per minute
C: coefficient related to the type of construction
A: the total floor area in m^2

Adjustments to the calculated fire flow can be made based on occupancy, sprinkler protection and exposure to other structures. The Final Fire Flow shall not exceed 45,000 L/min nor be less than 2,000 L/min.

The specific details of future buildings were not available at the time of preparation for this report, therefore, an estimate for the building materials, fire separations, and contents have been assumed based on experience for typical single and semi-detached homes. Combustible wood frame construction with limited combustible occupancy and no sprinkler have been assumed in our calculation. An average lot size with a maximum of 30% lot coverage, as permitted by current zoning By-law, have been considered. Expositions were calculated according to permitted setbacks. Refer to spreadsheets in **Appendix B** for full calculations of fire flow for fire fighting demand using both methods.

OBC calculation method has resulted in 2,700 L/min and the FUS in 9,000 L/min (150 L/s).
Water supply for fire fighting will be delivered to the fire hydrants through the municipal system. It is understood that the Municipality has a fire department equipped with a superior tanker shuttle service.

3 fire Hydrants are proposed with a maximum spacing of 110 m as per *Table 4.9* of *Ottawa Guidelines.*

The anticipated water demand is summarized as follows:

Parameter	Anticipated Demand	
	(L/s)	(L/min)
Average Day Demand	0.49	29.6
Max Day Demand	2.41	144.8
Peak Hour	3.65	218.7
Required Fire Flow	150.0	9,000
Fire Flow + Max Day	**152.4**	**9,145**

Table -3 Summary of Anticipated Water Demand

2.3 CONCLUSION

It is proposed to provide water supply within the subdivision through a new 150 mm diameter PVC Class 150 DR 18 in the shape of two loops. The proposed watermain will be connected to the proposed 250 mm diameter watermain at Adelaide St at two locations as shown in the General Plan of Services.

Under normal use, pressure shall be kept between 345 kPa (50 psi)and 552 kPa (80 psi). For peak hour demand pressure shall be greater than 276 kPa (40 psi) and lower than 552 kPa (80 psi). Residual pressure for fire flow and maximum day demand shall be kept greater than 140 kPa (20 psi).

Hydraulic Analysis: Assuming a pressure of 350 kPa at Adelaide watermain, a model using EPANET 2.2 software is used to assess headlosses and velocities within the proposed watermain under maximum day and required fire flow demand condition. Refer to **Appendix B**. The results of the hydraulic simulation remain comparable to the existing watermain in the area. Residual pressure is kept above 140 kPa and velocities less than 5 m/s.

3.0 SANITARY SERVICING

3.1 DESIGN CRITERIA

Using the *Ottawa Sewer Design Guidelines,* sanitary sewage flow for the proposed development is estimated as follows:

- Population: residential occupancy for single family dwelling 3.4 person per unit and for semi-detached 2.7 person per unit (Ottawa Guidelines, Table 4.2) = 152 persons
- Peak Flow Design Calculation:

  - Average daily flow per capita = 280 L/pers./day (as per latest Technical Bulletins)

  - Harmon's Residential Peaking Factor = $1 + (14 / (4 + (P / 1000)^{0.5}))$ (Max.= 4; Min.= 2)

- Wet weather infiltration contribution (Extraneous): 0.28 L/s/effective gross ha
- Dry weather infiltration contribution (Extraneous): 0.05 L/s/effective gross ha

Gross residential area includes lots and roadways. Block 28 (pond) is not included.

3.2 PROPOSED SERVICING AND CALCULATIONS

The total peak design flow rate is the sum of the peak dry weather flow rate as generated by population and land use for the design contributing area plus all extraneous flow allowances. Detailed calculations for sanitary flows are exhibited in **Appendix B**. Results are summarized in the following table 4:

Design Parameter	**Flow (m^3/day)**	**Flow (L/s)**
Average Dry Weather Flow Rate	54.1	0.63
Peak Dry Weather Flow Rate	162.7	1.88
Peak Wet Weather Flow Rate	227.5	2.63

Table -4 Summary of Sanitary Flows

The total peak sanitary flow rate from the proposed development represents 10.9 **%** of the capacity of the proposed sewer at Adelaide St (24.1 L/s) running east to west along Adelaide St.

3.3 CONCLUSION

It is proposed to construct a sanitary sewer composed of 1200 mm inner diameter manholes and 200 mm diameter PVC DR 35 pipes with a minimum pipe slope of 0.32% within the subdivision. Refer to **Appendix B** for the sanitary sewer design sheet. The gravity sewer will outlet into Adelaide St proposed sewer. The maximum distance between manholes is 120 m. The hydraulic grade line is at least 0.3 m below footings.

All sanitary laterals shall be 135 mm diameter DR 28 PVC pipes with minimum 1% slopes. Backwater valves shall be installed on all sanitary and storm laterals.

The sanitary design will also accommodate the servicing of second dwelling units in all lots.

Sewage discharges will be domestic in type and in compliance with the *City of Ottawa Sewer Use By-law* and *Ontario Building Code (OBC).*

4.0 STORMWATER AND STORMWATER MANAGEMENT

Storm water will be captured and conveyed to a detention pond in the open space at the south east side of the site.

The quantity control target is to limit the maximum post-development runoff rate discharged from the site for all storm events, up to and including the 100-year design storm, to that of pre-development flow

rates. Runoff in excess will be temporarily stored on site in a detention basin and discharged gradually into the existing *Creek*.

The quality control consists of an enhanced level of treatment (80% of TSS removal) by on-site measures to protect receiving waters.

Refer to the “Stormwater Management Report” for detailed analysis and calculations of quantity, quality and storage requirements.

5.0 EROSION AND SEDIMENT CONTROL MEASURES

Erosion and Sediment Control (ESC) measures will be implemented in order to mitigate the adverse environmental impacts caused by the release of silt-laden stormwater runoff into receiving watercourses and to ensure that sediment is contained within the site. The measures will be well kept during construction until vegetation has been re-established as specified in drawings and in accordance with the requirements of latest provincial standards *OPSS 805.*
Refer to *“Stormwater Management Report”* and *“Erosion and Sediment Control Plan”* for more details about erosion and sediment control.

6.0 CONCLUSION AND RECOMMENDATIONS

The preceding preliminary servicing report has been prepared to support the development of a subdivision composed of 55 blocks and lots for semi-detached and single family houses. The conclusions are as follows:

- Based on estimated water demand, and upon confirmation by the Municipality of acceptable boundary conditions, the 250 mm diameter watermain within Adelaide St has sufficient water supply capacity to support the proposed development.
- The watermain system is able to maintain a minimum pressure of 140 kPa at ground level at all points in the distribution system under maximum day demand plus fire flow conditions. The Municipality fire department shall review the required fire flow design.
- The proposed watermain within the subdivision will be of 150 mm diameter DR 18 PVC in the form of two loops. Water services shall be 25 mm diameter Type K soft copper or Cross-linked Polyethylene.
- The proposed sanitary sewer will be composed of a 200 mm diameter DR 35 PVC pipe and 1200 mm diameter manholes as per OPSD 701.010. The sewage will be conveyed gravitationally to the proposed Adelaide St sewer. Downstream sewer has adequate capacity to convey the estimated wastewater generated from the development.
- Blocks 3 and 15 will be serviced from Street A through the backyards. Easements may be required.
- The design of Adelaide St infrastructure will be coordinated with *Hannan Hills* design team.
- Stormwater will be conveyed through a proposed separate storm sewer within the right-of-ways to a proposed on-site stormwater management structure where quality and quantity control will be achieved. Discharge flow rates will match the pre-development levels.
- Hydro, gas main and telecommunication have not been examined in this report. Connections to the development will be coordinated with authorities having jurisdictions prior to construction.

Respectfully submitted,

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APPENDICES

Appendix A

- Figure 1: Site Location

Appendix B

- Domestic Water Supply Calculations
- Fire Flow Calculations
- Sanitary Sewer Calculations

Appendix C

- Correspondences

APPENDIX - A

FIGURE – 1

APPENDIX - B

ALMONTE SUBDIVISION – MENZIE/ADELAIDE ST MISSISSIPPI MILLS

ANTICIPATED WATER DEMAND

I- POPULATION

UNIT TYPE	QTY	PERSON PER UNIT *	TOTAL
Townhouses	0	2.7	0.0
Single Detached	5	3.4	17.0
Semi-Detached	50	2.7	135.0
Apartment (Average)	0	1.8	0.0
Total Population	**55**		**152.0**

* As per Ottawa Sewer Design Guidelines – Table 4.1

II- DESIGN CRITERIA

Design Parameter	Value
Population in capita	152.0
Residential Average Demand Volume Per Capita in L/c/day	280
Average Demand Volume in m^3/day	42.6
Maximum Daily Demand (**4.9** x Average) in m^3/day **	208.5
Maximum Hourly Demand (**7.4** x Average Daily) in m^3/day **	314.9
Maximum Hourly Water Flow Required in L/s	**3.65**

** Peak factors of 3.5 and 5.2 for maximum daily demand and maximum hourly demand from Table 3-3 of the MOE Design Guidelines for Drinking-Water Systems for population fewer than 500 persons.

III- SUMMARY

Parameter	Anticipated Demand	
	(L/s)	(L/min)
Average Day Demand	0.49	29.6
Max Day Demand	2.41	144.8
Peak Hour	3.65	218.7
Required Fire Flow	150.0	9,000
Fire Flow + Max Day	**152.4**	**9,145**

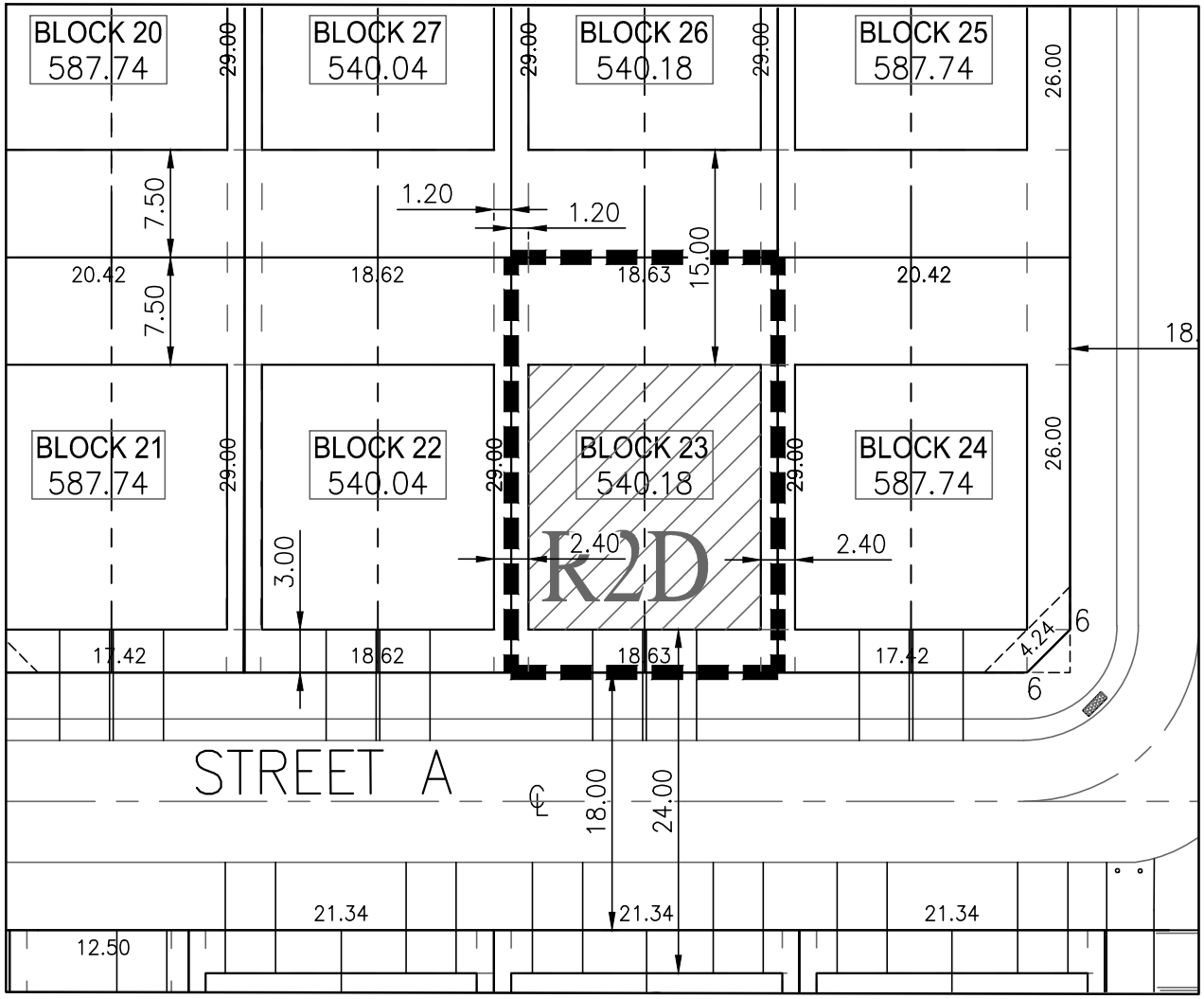
IV- PRESSURE REQUIREMENTS

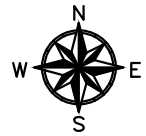
Pressure Check	Minimum Pressure		Maximum Pressure	
	(kPa)	(psi)	(kPa)	(psi)
Normal Use	**345**	**50**	**552**	**80**
Peak Hour Demand	**276**	**40**	**552**	**80**
Maximum Day and Fire Flow	**140**	**20**	**552**	**80**
Maximum pressure at any point in occupied areas			**552**	**80**
Maximum pressure at any point in unoccupied areas			**689**	**100**

* Proposed watermain pipe: 150 and 200 mm diameter

*Friction Factors: 100 and 110

* Proposed 3 fire hydrants; maximum distance between fire hydrants= 110 m





AS PER ZONING BY-LAW (R2D):
MAXIMUM BUILDING FOOTPRINT: 30% OF LOT AREA
MINIMUM SETBACKS: AS SHOWN

LOT 23 AREA = 540.18 m^2
30% OF LOT AREA = 162.05 m^2

ZONING: R2D
MIN. LOT AREA: 225 m^2 (EACH UNIT)
MIN. FRONTAGE: 7.5 m
MIN. FRONT YARD: 3 m
MIN. REAR YARD: 7.5 m
MIN. SIDE YARD: 1.2 m (EXT. SY: 3 m)
MAX. HEIGHT: 11 m
MAXIMUM BUILDING FOOTPRINT = 30% OF LOT AREA

NOTES
* DISTANCES ARE IN METRE
* PLAN NORTH SHOWN IS NOT THE GEOGRAPHIC NORTH

TYPICAL SEMI-DETACHED LOT LAYOUT USED FOR FIRE FLOW DEMAND ESTIMATION (1:500)

Ontario Building Code 2012 (OBC), Appendix A, division B, A-3.2.5.7

Water supply for firefighting: $Q = K.V.S_{tot}$

Q = minimum supply of water available in litres (L)

K = water supply coefficient for residential occupancy C and combustible construction A-3.2.5.7 Table 1

V = total building volume in cubic metres

S_{tot} = total of spatial coefficient values from property line exposure on all sides, to a maximum of 2.0

$S_{tot} = 1 + (S_{side1} + S_{side2} + S_{side3} + \ldots \text{ etc.})$

Typical single family house

Average Building Height =	11.0 m
Building Footprint =	162 m²
Total Building A Volume V =	1 782 m³

K from A-3.2.5.7 Table 1 = 23 Building of combustible construction. Floor assemblies are fire separations but with no fire-resistance rating.

* **$S_{tot} = 1 + (S_{side1} + S_{side2} + S_{side3} + \ldots \text{ etc.})$ As per figure 1**

		$S_{side\ i}$
Exposure Distance N =	15.0 m	0
Exposure Distance S =	24.0 m	0
Exposure Distance E =	2.4 m	0.5
Exposure Distance W =	2.4 m	0.5
Total Spatial Coefficient =		**2**

Minimum supply of water in litres Q = **81 972 L**

For Q < 108 000 L

Required Minimum Water Supply Flow Rate as per Table 2, A-3.2.5.7 :

2 700 L/min at a minimum pressure of 140 kPa

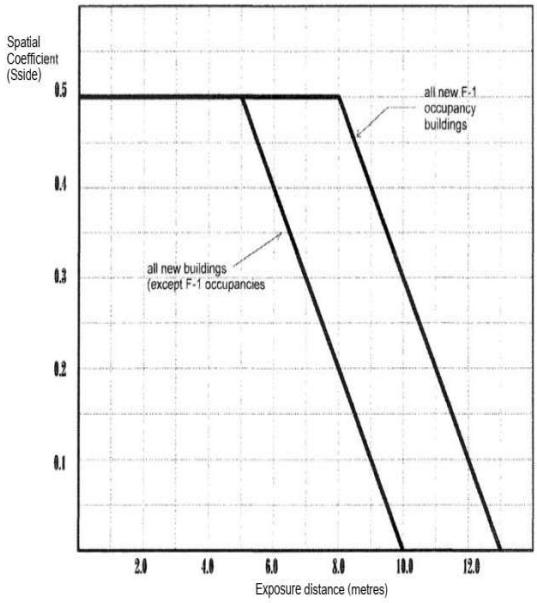


Figure 1
Spatial Coefficient vs Exposure Distance

Further clarification of intent and sample problems and solutions are contained in the "Fire Protection Water Supply Guideline for Part 3 in the Ontario Building Code". This guideline may be obtained through the Office of the Fire Marshal's web site at: "www.ofm.gov.on.ca"

1- Required Basic Fire Flow (FUS – PART II. 1)

$F = 220\ C\ \sqrt{A}$ Where:

F: required fire flow in litres per minute

C: coefficient related to the type of construction

C = 1.5 for wood frame construction (structure essentially all combustible)

= 1.0 for ordinary construction (brick or other masonry walls, combustible floor and interior)

= 0.8 for non-combustible construction (unprotected metal structural components, masonry or metal wall)

= 0.6 for fire-restive construction (fully protected frame, floors, roof)

A: the total floor area in m² (including all storeys, but excluding basements at least 50% below grade)

			Semi-detached Lot	
Ground Floor Area A =	**162**	m²	Average Lot Area is:	540 m²
Height (Storeys) =	**2**		30%	162 m²
Total Area A =	**324**	m²		
C =	**1.5**	Wood frame construction (structure essentially all combustible)		
F =	**5,940**	L/min		
Rounded to the nearest 1,000 L/min F =	**6,000**	L/min		

Adjustments to the calculated fire flow can be made based on occupancy, sprinkler protection and exposure to other structures. The Final Fire Flow shall not exceed 45,000 L/min nor be less than 2,000 L/min.

Criteria:

* Type of construction: Wood frame construction
* Occupancy type: Limited combustible
* Sprinkler protection: No
* Exposures: Varies

2- Adjustment for Occupancy (FUS – PART II. 2)

Occupancy	Charge
Non-Combustible	-25%
Limited-Combustible	-15%
Combustible	No charge
Free Burning	+15%
Rapid Burning	+20%

Adjustment for “Combustible” =	-15.00%	%
Adjusted Fire Flow =	**5,100**	L/min

3- Adjustment for Sprinkler Protection (FUS – PART II. 3)

Reduction for existence of sprinkler system =	0%	
Reduction for water supply standard for both sprinkler system and fire department hose lines =	0%	
Reduction for fully supervised =	0%	
Total adjustment for sprinkler =	**0**	L/min

4- Adjustment for Exposures of Other Structures (FUS – PART II. 4)

SEPARATION (m)	CHARGE
0 to 3m	25%
3.1 to 10m	20%
10.1 to 20m	15%
20.1 to 30m	10%
30.1 to 45m	5%

No interpolation

North side =	15%	(Separation = 15 m)
East side =	25%	(Separation = 2.4 m)
South side =	10%	(Separation = 24 m)
West side =	25%	(Separation = 2.4 m)
Total charge for exposures =	75%	% (Shall not exceed 75%)
Total adjustment for exposures =	**3,825**	L/min
Adjusted Fire Flow (2)-(3)+(4) =	**8,925**	L/min
Rounded to the nearest 1,000 L/min, F =	**9,000**	L/min

F = **150** L/s

Volume for 30 min Fire Flow V_{fire}= **270,000** L

Ottawa Guidelines caps the required fire flow for residential to 10 000 L/min

ALMONTE SUBDIVISION
MENZIE / ADELAIDE ST MISSISSIPPI MILLS
SANITARY SEWER DESIGN

1- DESIGN FLOW CALCULATION

Q_d = (M . q . P /86.4) + I . A Where:

Q_d = Peak Design Flow (L/s)

M = Peaking Factor (Max = 4; Min = 1.5)

q = Average Daily Flow per capita per day (L/c/day)

P = Population

I = Infiltration Contribution (0.28 L/s/eff. gross ha)

A = Gross Drainage Area (ha)

A (ha) =	2.6805	ha	
q (L/c/day) =	280	L/c/day	
Population =	152.0	Capita	
M (Harmon's Peaking Factor) =	3.55	M= 1+(14/(4+(P/1000)^0.5))k = **3.55**	
Extraneous Flow 0.28 x A (L/s) =	0.75	L/s	K=0.8
Extraneous Flow 0.05 x A (L/s) =	0.13	L/s	As per Technical Bulletin
Average Dry Weather Flow Rate ADWF =	0.63	L/s	
Peak Dry Weather Flow Rate PDWF =	1.88	L/s	
Peak Wet Weather Flow Rate Q_d (L/s) =	**2.63**	L/s	(Design Flow)
Q_d (m^3/day) =	**227.51**	m^3/day	

2- SEWER CAPACITY CALCULATION – ADELAIDE ST

200mmØ @ 0.5%

Manning's Equation
$Q=1/n.A.R^{2/3}.S^{1/2}$

D (mm) =	**203**	
A (m^2) =	0.0324	
n =	**0.013**	Manning Coefficient
R (m) =	0.05	Hydraulic Radius (m)
S =	**0.50%**	Slope (%)

$Q=1/n * A * R^{2/3} * S^{1/2}$

Full Pipe Capacity Q_f (m^3/s)= **0.0241** m^3/s = **24.1** L/s

V_f (m/s)= **0.75** m/s

3- PROPOSED SEWER CAPACITY CALCULATION (WITHIN THE SUBDIVISION)

Refer to sanitary sewer calculation sheet for all segments

For total sanitary flow rate at 0.32% slope:

Manning's Equation
$Q=1/n.A.R^{2/3}.S^{1/2}$

D (mm) =	**203**	
A (m^2) =	0.0324	
n =	**0.013**	Manning Coefficient
R (m) =	0.05	Hydraulic Radius (m)
S =	**0.32%**	Slope (%)

$Q=1/n *A*R^{2/3} *S^{1/2}$

Full Pipe Capacity Q_f (m^3/s)=	**0.0193**	m^3/s = 19.3 L/s
V_f (m/s)=	**0.60**	m/s
Minimum Velocity Vsc = 0.9885*R^(1/6)=	**0.60**	m/s (For self-cleaning)

Q_{avg} (Dry) (L/s) =	**1.88**	L/s		
Pipe % Full = Q_{avg}/Q_{full} =	9.75%	0.098		
Graph y/D = f(Q_{avg}/Q_{full} , V_{avg}/V_{full}) =>	y/D =	0.205	y = 42	mm
And V_{avg}/V_{full} =		0.64		
V_{avg} =		**0.38**	m/s	n = Constant

Q_d (Wet) (L/s) =	**2.63**	L/s		
Pipe % Full = Q_{avg}/Q_{full} =	13.64%	0.136		
Graph y/D = f(Q_{avg}/Q_{full} , V_{avg}/V_{full}) =>	y/D =	0.245	y = 50	mm
And V_d/V_{full} =		0.71		
Vd =		**0.42**	m/s	n = Constant

NOTES:

Minimum diameter for sanitary main sewer: 200 mm (8")
Maximum velocity = 3 m/s
Minimum velocity = 0.6 m/s
Minimum depth of cover 2.5 m from crown of sewer to finished grade
Minimum vertical clearance between sewer and watermain is 0.30m and 0.5m if sewer above
Minimum horizontal clearance between sewer and watermain is 2.5 m
Special treatment of manholes and pipe if high groundwater level
Maximum spacing of manholes 120 m
Drops at manholes: 30 mm (straight sewer) and 60 mm (45 to 90 deg sewer)
Pipe material: PVC DR of 35 320 kPa or equivalent
Manholes: precast or poured concrete as per OPSD standards
Bedding: as per OPSD standards and geotechnical

Project: PROPOSED RESIDENTIAL SUBDIVISION - ALMONTE - ON

GRAPH USED TO DETERMINE ACTUAL FLOW DEPTH AND VELOCITY

Q/Q_{full}	h/D	v/v_{full}	R/D	Q/Q_{full}	h/D	v/v_{full}	R/D
0.095	0.205	0.64	0.1233	0.610	0.568	1.04	0.2697
0.100	0.211	0.65	0.1265	0.620	0.575	1.04	0.2715
0.105	0.216	0.66	0.1291	0.630	0.581	1.05	0.2731
0.110	0.221	0.67	0.1317	0.640	0.587	1.05	0.2745
0.115	0.226	0.68	0.1343	0.650	0.594	1.05	0.2762
0.120	0.231	0.69	0.1369	0.660	0.600	1.05	0.2776
0.125	0.236	0.69	0.1395	0.670	0.607	1.06	0.2793
0.130	0.241	0.70	0.1421	0.680	0.613	1.06	0.2806
0.135	0.245	0.71	0.1441	0.690	0.620	1.06	0.2821
0.140	0.250	0.72	0.1466	0.700	0.626	1.06	0.2834
0.145	0.255	0.72	0.1491	0.710	0.633	1.06	0.2848
0.150	0.259	0.73	0.1511	0.720	0.640	1.07	0.2862
0.155	0.263	0.74	0.1531	0.730	0.646	1.07	0.2874
0.160	0.268	0.74	0.1556	0.740	0.653	1.07	0.2887
0.165	0.272	0.75	0.1575	0.750	0.660	1.07	0.2900
0.170	0.276	0.76	0.1595	0.760	0.667	1.07	0.2912
0.175	0.281	0.76	0.1619	0.770	0.675	1.07	0.2925
0.180	0.285	0.77	0.1638	0.780	0.682	1.07	0.2936
0.190	0.293	0.78	0.1676	0.790	0.689	1.07	0.2947
0.200	0.301	0.79	0.1714	0.800	0.697	1.07	0.2958
0.210	0.309	0.80	0.1751	0.805	0.701	1.08	0.2964
0.220	0.316	0.81	0.1784	0.810	0.705	1.08	0.2969
0.230	0.324	0.82	0.1820	0.815	0.709	1.08	0.2974
0.240	0.331	0.83	0.1851	0.820	0.713	1.08	0.2979
0.250	0.339	0.84	0.1887	0.825	0.717	1.08	0.2984
0.260	0.346	0.85	0.1918	0.830	0.721	1.08	0.2989
0.270	0.353	0.86	0.1948	0.835	0.725	1.08	0.2993
0.280	0.360	0.86	0.1978	0.840	0.729	1.07	0.2997
0.290	0.367	0.87	0.2007	0.845	0.734	1.07	0.3002
0.300	0.374	0.88	0.2037	0.850	0.738	1.07	0.3006
0.310	0.381	0.89	0.2066	0.855	0.742	1.07	0.3010
0.320	0.387	0.89	0.2090	0.860	0.747	1.07	0.3014
0.330	0.394	0.90	0.2118	0.865	0.751	1.07	0.3018
0.340	0.401	0.91	0.2146	0.870	0.756	1.07	0.3022
0.350	0.407	0.92	0.2170	0.875	0.761	1.07	0.3025
0.360	0.414	0.92	0.2197	0.880	0.766	1.07	0.3028
0.370	0.420	0.93	0.2220	0.885	0.770	1.07	0.3031
0.380	0.426	0.93	0.2243	0.890	0.775	1.07	0.3033
0.390	0.433	0.94	0.2269	0.895	0.781	1.07	0.3036
0.400	0.439	0.95	0.2291	0.900	0.786	1.07	0.3038
0.410	0.445	0.95	0.2313	0.905	0.791	1.07	0.3040
0.420	0.451	0.96	0.2334	0.910	0.797	1.07	0.3041
0.430	0.458	0.96	0.2359	0.915	0.803	1.06	0.3042
0.440	0.464	0.97	0.2380	0.920	0.808	1.06	0.3043
0.450	0.470	0.97	0.2401	0.925	0.814	1.06	0.3043
0.460	0.476	0.98	0.2420	0.930	0.821	1.06	0.3043
0.470	0.482	0.99	0.2441	0.935	0.827	1.06	0.3042
0.480	0.488	0.99	0.2461	0.940	0.834	1.05	0.3040
0.490	0.494	1.00	0.2481	0.945	0.841	1.05	0.3037
0.500	0.500	1.00	0.2500	0.950	0.849	1.05	0.3033
0.510	0.506	1.00	0.2519	0.955	0.856	1.05	0.3029
0.520	0.512	1.01	0.2538	0.960	0.865	1.04	0.3022
0.530	0.519	1.01	0.2559	0.965	0.874	1.04	0.3014
0.540	0.525	1.02	0.2577	0.970	0.883	1.04	0.3004
0.550	0.531	1.02	0.2595	0.975	0.894	1.03	0.2989
0.560	0.537	1.02	0.2612	0.980	0.905	1.03	0.2972
0.570	0.543	1.03	0.2629	0.985	0.919	1.02	0.2946
0.580	0.550	1.03	0.2649	0.990	0.935	1.02	0.2908
0.590	0.556	1.03	0.2665	0.995	0.956	1.01	0.2844
0.600	0.562	1.04	0.2681	1.000	1.000	1.00	0.2500

APPENDIX - C

Pre-Consultation Meeting Notes
Virtual zoom meeting – July 14, 2022
Prepared By: Julie Stewart

In Attendance
Ash Sharma -owner
Sampat Poddar – owner
Mongi Mabourak – Engineer
Greg Winters – Planner, Novatech
Susan Gordon – Engineer, Novatech
James Ireland – Project Planner, Novatech
Ken Kelly – CAO, Mississippi Mills
Cory Smith – Public Works, Mississippi Mills
Melanie Knight – Senior Planner, Mississippi Mills
Julie Stewart – County Planner, County of Lanark

Ash provided a brief overview of the proposed development,
Provided a draft concept plan dated May 3, 2022

Legal
The owner needs to provide the block map, parcel abstract and other legal information to confirm ownership and details of the subject land.

Planning
Blocks 16-19 on concept plan have frontage on Adelaide Street and new internal street. Melanie to review and provide comment on preferred streetscape.

Affordable Housing needs to be provided and secured by agreement. Consultation with other agencies encouraged, for example, CMHC or Lanark County.

Engineering / Servicing
- Concept plan shows 18m road, the standard is 20 m. If 18m then this needs to be justified. Cory will provide the specs and cross-section for 18m and 20m to engineer's.
- Servicing - will be an issue. Cory will send information from the master plan.
- Cory advised that he previously provided a letter to the owner in regards to servicing.
- A conceptual plan for servicing will need to be provided.

- There is a need to figure out best way to service the area.

Susan Gordon

- Advised there is a need to look at servicing for the whole area. The engineers will need to look at Cavanagh development and Sharma development together.

The owner and all consultants are to re-group and determine whom is involved in the project. Once that is established a further meeting with MVCA and Gemtec can be coordinated by the County.

Please refer to the attached Pre-Consultation Checklist and comments from the Municipality of Mississippi Mills.

Mississippi Mills

The Corporation of the
Municipality of Mississippi Mills
Municipal Office
3131 Old Perth Road
RR2, P.O. Box 400
Almonte, ON
K0A 1A0
Tel: (613) 256-2064
Fax: (613) 256-4887

February 28, 2022

Memo

By: Cory Smith, A/Director of Public Works

Re: Servicing requirements for the development area known as Lots 21-25 Plan 6262
1.65 ha (4.1 ac) Menzie Parcel

This memo has been prepared as a general overview of servicing requirements for the development area known as the 1.65 ha (4.1 ac) Menzie Parcel. This memo is based on information in the Water and Wastewater Master Plan. Additional works may be required based on the density of the development and other changes to the existing system.

The property is approximately 1.65 ha (4.1 ac) in size. It is bounded to the North by an unopened/unmaintained segment of Adelaide St., to the East by an unopened segment of Menzie Street. This segment also contains a reach of the Almonte Municipal Drain. To the south it is bounded by an unopened road allowance that appears to be the continuation of Augusta St. This segment also contains a reach of the Almonte Municipal Drain. To the West the property is bounded by a 1.25 ha (3.1 ac) parcel described as Plan 6262 BLK C, Lot 2.

The areas bounded by the Municipal Drain should be evaluated for required buffer zones resulting from what may be considered an unevaluated wetland. Consultation with the Mississippi Valley Conservation Authority is recommended as there may be additional development requirements under the Regulatory Framework of the Conservation Authority.

Roadways

It is intended that the site is to be accessed from the unopened/unmaintained extension of Adelaide St. Adelaide St. would need to be upgraded and extended to meet Mississippi Mills Municipal Standards for an urban right-of-way cross section. The design should consider incorporating access to the 1.25 ha (3.1 ac) lot to the West of the property.

Water Servicing

Water servicing has not been extended to this site at this time. Water servicing is likely to occur from an extension of the watermain on Adelaide St. The Master Plan also calls for an extension of the watermain down the unopened road allowance for Menzie Street. Considerations for looping of the system need to be contemplated in the design and boundary conditions should be modelled for this site to be incorporated into the design and requirements for servicing this site. Figure 17 from the Water Wastewater master plan has been attached to this memo for reference.

Sanitary Servicing

Sanitary servicing has not been extended to this site at this time. It is anticipated that sanitary servicing will connect into a sanitary main to be constructed in the unopened road allowance of Florence Street. The connection to the unconstructed main will likely be from the unopened segment of Adelaide St. and will require construction of a new sanitary main along Adelaide. A pump station may be required, or alternative routes could be reviewed during design.

Stormwater Management

Stormwater Management will require review by the designer. The outlet is most likely to be to the Almonte Municipal Drain. A review of the downstream effects on the drain will be required. Consultation with the MVCA should also occur.

Other Considerations

Extension of the roadway along Adelaide St. and water and sewer services may be beneficial to other development properties in the area. Considerations of cost sharing alternatives should be explored.

Cory Smith
A/Director of Roads and Public Works
Mississippi Mills
613 256-2064 ext. 229.

CORPORATION OF THE MUNICIPALITY OF MISSISSIPPI MILLS
3131 OLD PERTH ROAD · PO BOX 400 · RR 2 · ALMONTE ON · K0A 1A0

PHONE: 613-256-2064
FAX:613-256-4887
WEBSITE: www.mississippimills.ca

August 11, 2022

Julie Stewart, County Planner
jstewart@lanarkcounty.ca

RE: PROPOSED MENZIES SUBDIVISION
PRECONSULTATION COMMENTS
FILE: TBD

Please see attached the Planning and Engineering comments regarding the proposed Plan of Subdivision for the Menzie's lands (located at the southerly corner of the unopened road allowance of Adelaide Street and Menzie Road in Almonte). The following comments are based on the concept plan of subdivision submitted to the County for a formal pre-consultation meeting (attached).

Planning

1. Blocks 16 to 19 – the dwellings should be oriented towards Adelaide Street as opposed to Street B to provide activation of Adelaide Street.
2. Consider orienting Blocks 3 or 15 towards Adelaide Street
3. Sidewalks should be added to the Adelaide St right of way
4. The 18-metre cross section can be found in our Urban Design Guidelines
5. A concurrent Zoning By-law Amendment application will be required which reflects the proposed land uses.

Engineering

Please see attached the Servicing memo previously provided to the applicant. Public Works has been in direct contact with Novatech Engineering following the pre-consultation meeting and has provided the necessary engineering information.

I trust the above will assist you. If you have any further questions regarding this matter, please feel free to contact me at your convenience.

Respectfully yours,

Melanie Knight, MCIP, RPP
Senior Planner
Municipality of Mississippi Mills

Cc: Cory Smith, A/Director of Public Works

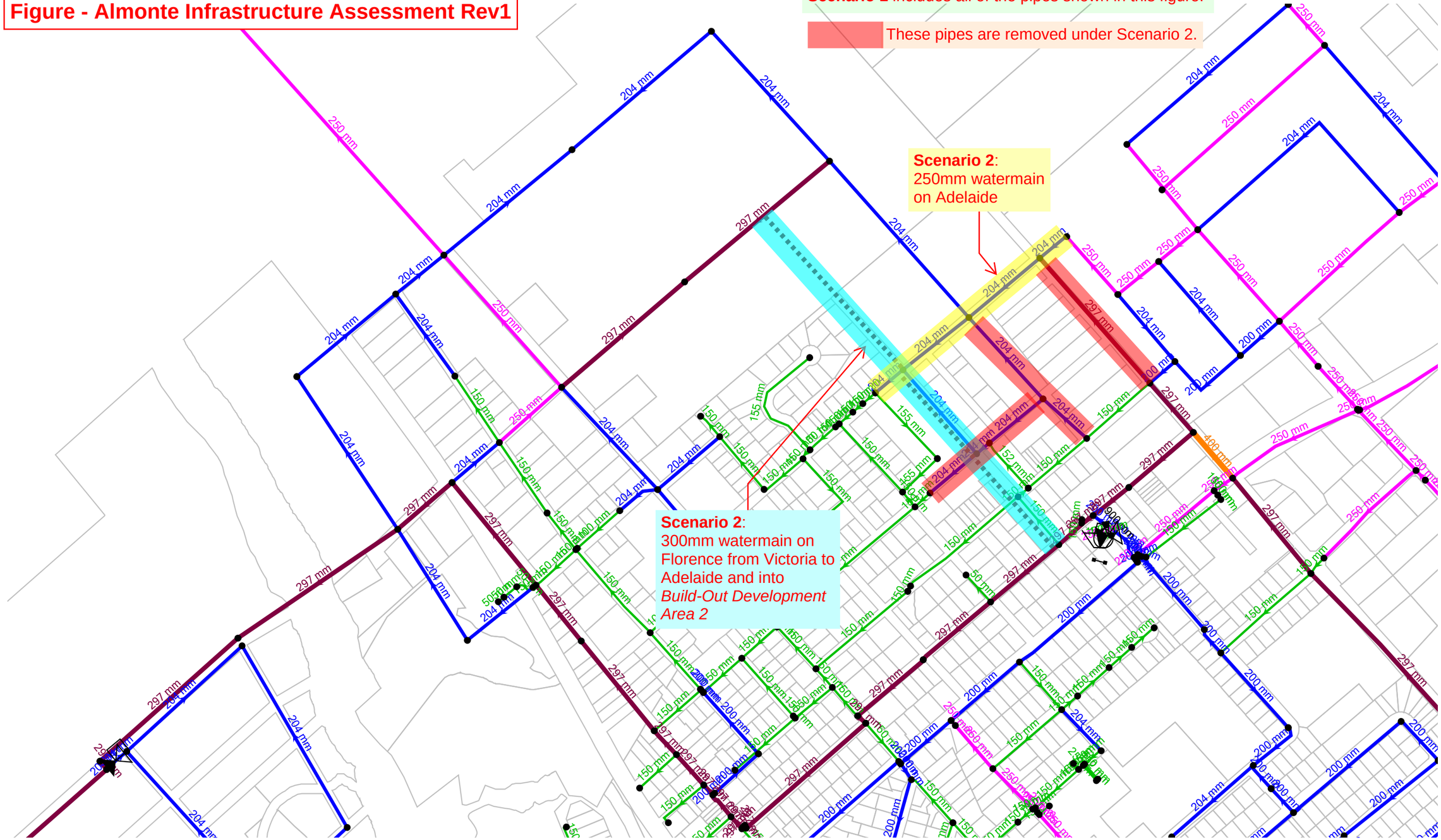
Figure - Almonte Infrastructure Assessment Rev1

Scenario 1 includes all of the pipes shown in this figure.

These pipes are removed under Scenario 2.

Scenario 2:
250mm watermain
on Adelaide

Scenario 2:
300mm watermain on
Florence from Victoria to
Adelaide and into
*Build-Out Development
Area 2*



Existing: 2-117
Residential - Greenfield
10 - 20 years
11.72 L/s
Pumped

Existing: 1-108
Residential - Greenfield
5 - 10 years
10.27 L/s
Pumped

Existing: 1-325
Industrial
Build-out
11.48 L/s
Gravity

Existing: 1-120
Industrial
Build-out
2.63 L/s
Pumped

Existing: 1-107
Commercial
5 - 10 years
7.42 L/s
Pumped

To White Tail Ridge Subdivision Detail

Existing: 2-328
Residential - Greenfield
10 - 20 years
2.75 L/s
Pumped

Existing: 2-207
Upgrade: Victoria and Florence
Development Area 2
Build-out
40.54 L/s
Gravity

BUILD-OUT DEVELOPMENT AREA 2

Existing: 2-207
Upgrade: Victoria and Menzie
Residential - Infill
5 - 10 years
5.97 L/s
Gravity

Existing: 4-009
Commercial
5 - 10 years
0.31 L/s
Gravity

4-009
Residential - Infill
5 - 10 years
0.92 L/S
Gravity

Existing: 3-119
Almonte Mews
0 - 5 years
1.04 L/S
Gravity

Existing: 3-043
Development Area 3
Build-out
41.53 L/s
Gravity

Existing: 4-321
Riverfront Estates
0 - 5 years
12.08 L/S
Gravity

Existing: 3-119
Development Area 4
Build-out
17.43 L/s
Pumped

BUILD-OUT DEVELOPMENT AREA 3

BUILD-OUT DEVELOPMENT AREA 4

BUILD-OUT DEVELOPMENT AREA 1

RIVEFRONT ESTATES PHASES 4 TO 6

MILL RUN PHASES 4 TO 5

Existing: 2-207
Upgrade: Victoria and Menzie
Commercial
5 - 10 years
1.06 L/s
Gravity

4-108
Mill Run
0 - 5 years
19.34 L/S
Gravity

Existing: 4-105
Commercial
5 - 10 years
0.89 L/s
Gravity

Existing: 4-109
Commercial
5 - 10 years
1.63 L/s
Gravity

Existing: 4-107
Upgrade: Ottawa and Menzie
Business Park
5 - 10 years
10.99 L/s
Gravity

Existing: 4-107
Upgrade: Ottawa and Menzie
Business Park
0 - 5 years
12.36 L/s
Gravity

Existing: 4-107
Upgrade: Ottawa and Menzie
Industrial
Build-out
12.25 L/s
Pumped

Existing: 4-107
Upgrade: Ottawa and Menzie
Community Facility
10 - 20 years
2.37 L/s
Pumped

Existing: 4-107
Upgrade: Ottawa and Menzie
Development Area 1
Build-out
25.07 L/s
Pumped

Existing: 4-432
Riverfront Estates
0 - 5 years
1.07 L/s
Gravity

White Tail Ridge Subdivision Detail

Existing: 2-330
White Tail Ridge
0 - 5 years
0.35 L/S
Gravity

Existing: 2-330
White Tail Ridge
5 - 10 years
3.92 L/S
Gravity

Island Pump Station
Hope & Glass Street Pump Station
Wastewater Treatment Plant
Gemmill Bay Pump Station
Christian Street Pump Station
Mill Street Pump Station
Spring Street Pump Station
Ann Street Pump Station
Rivertront Pump Station
Orchardview Pump Station

Mississippi River
Wolf Grove Creek

Infrastructure

- 4-102 Manhole ID
- Pumping Station
- Cleanout
- Sanitary Manhole
- Saniatry Sewer
- Private Forecmain
- Forcemain
- Sanitary Trunk Sewers

Land Use

- Almonte Ward Limits
- Existing Lots
- Future Lots
- Registered Subdivision
- Build Out
- Business Park (17.0 ha)
- Community Facility (3.1 ha)
- Commercial (15.6 ha)
- Industrial (24.1 ha)
- Residential - Geenfield (34.2 ha)
- Residential - Infill (16.0 ha)

Existing: 4-109
Upgrade : Ottawa and Menzie
Commercial
5 - 10 years
1.63 L/s
Gravity

- Manhole ID
- Intersection
- Development Name or Type
- Development Timeline
- Estimated Park Flow
- Anticipated Future Trunk Servicing

No.	ISSUE / REVISION	DD/MM/YY

VERIFY SHEET SIZE AND SCALES. BAR TO THE RIGHT IS 25mm IF THIS IS A FULL SIZE DRAWING. 0 25mm

SCALE: 0 50 100 200 300 400 Meters

CLIENT:

CONSULTANT:
J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS
www.jlrichards.ca

CONSULTANT:

PROFESSIONAL STAMP

PROFESSIONAL STAMP

PROJECT:
MUNICIPALITY OF MISSISSIPPI MILLS
ALMONTE WARD WATER AND WASTEWATER INFRASTRUCTURE MASTER PLAN UPDATE
MISSISSIPPI MILLS, ONTARIO

DRAWING:
WASTEWATER HYDRAULIC MODEL DEMAND ALLOCATION

DESIGN: MB	
DRAWN: KTK	DRAWING #:
CHECKED: SG	FIGURE 25
JLR #: 27456-01	

File: R:\27000\27456-01 Mississippi Mills - Master Plan Update\JLR DWG\Plan\27456-01 SimplifiedModel.mxd

PLOT DATE: January 5, 2018 10:32:24 AM