

TECHNICAL MEMORANDUM

DATE: FEBRUARY 28, 2020
TO: MURRAY CHOWN
FROM: MIROSLAV SAVIC
RE: 26 AYLMER AVENUE – SITE SERVICING BRIEF

Novatech has been retained to review the adequacy of existing services for the Zoning By-law Amendment and Site Plan application for the proposed development located at 26 Aylmer Avenue in the City of Ottawa.

Figure 1: Aerial View of The Site



The subject site is currently occupied by a large single detached house. A new three storey addition has been recently constructed at rear of the existing house. The proposed development converts the use of the building from a large single detached dwelling into a triplex. The existing footprint of the building will not be altered. The interior of the building will be changed to establish three separate units. The building will have one 3-bedroom unit and two 4-bedroom units. Refer to **Appendix A** for the proposed Site Plan.

The purpose of this memo is to review the water, sanitary and storm servicing requirements for the proposed building conversion and will provide an analysis on the existing infrastructure surrounding the site to ensure there is adequate capacity.

WATER SERVICING

There is an existing public 203mm diameter watermain in Aylmer Avenue that currently services the the subject site. Refer to **Figure 3 Existing Services**.

Figure 3: Existing Services



The exiting building service has been recently replaced with a new 20mm (3/4") diameter copper pipe from the back of the Aylmer Avenue sidewalk to the building.

The water demands for the proposed development were calculated and provided to the City of Ottawa to obtain boundary conditions to confirm serviceability.

The required fire flow is calculated using the Fire Underwriter's Survey method and is based on 3-storey above ground wood frame construction. The calculated fire flow demand is 8,000 L/min (133 L/s). refer to **Appendix B** for detailed calculations. A multi-hydrant approach to fire-fighting is anticipated to be required. There are three hydrants in Aylmer Avenue within 150m from the proposed building. One hydrant is in front of 30 Aylmer Avenue approximately 30m from the building; another in front of 48 Aylmer Avenue approximately 95m from the building; and a third hydrant is near the intersection with Bank Street approximately 105m from the building. All the hydrants are Class AA (blue bonnet) hydrants. As per **Table 1 Maximum flow to be considered from a given hydrant** in **Appendix I of Technical Bulletin ISTB-2018-02**, the combined flows from the three hydrants are summarized in **Table 1**.

Table 1: Combined Hydrant Flow Summary

| Fire Hydrants < 75m from Building | Fire Hydrants > 75m < 150m from Building | Combined Fire Flow |
|--------------------------------------|---|--------------------|
| 1 x 5,700 L/min | 2 x 3,800 L/min | 13,300 L/min |

Therefore, the combined fire flow from the three existing hydrants of 13,300 L/min exceeds the required fire flow of 8,000 L/min.

The domestic water demands for the proposed development, calculated as per the Ottawa Design Guidelines – Water Distribution are summarized in **Table 2**.

Table 2: Water Demand

| Average Day Demand | Maximum Day Demand | Peak Hour Demand |
|--------------------|--------------------|------------------|
| 0.04 L/s | 0.11 L/s | 0.22 L/s |

The detailed water demand calculations, boundary conditions and watermain analysis calculations for the existing public infrastructure are provided in **Appendix B**. The results of the hydraulic analysis are summarized below in **Table 3**.

Table 3: Water Analysis Results Summary

| Condition | Water Demand | Min/Max Allowable Operating Pressures | Limits of Design Operating Pressures |
|---------------------|--------------|--|---|
| High Pressure | 0.04 L/s | 80 psi (Max) | 55.7 psi |
| Max Day + Fire Flow | 133.10 L/s | 20 psi (Min) | 34.8 psi |
| Peak Hour | 0.22 L/s | 40 psi (Min) | 41.9 psi |

The results of the water analysis show there is adequate flow and pressure in the existing 203mm watermain in Aylmer Avenue to meet the required water demands.

As per paragraph **4.6.3 Service Sizes Residential** of the **Ottawa Design Guidelines - Water Distribution** the minimum size of residential water service shall be 25mm for lots having a residual pressure of up to and including 310 kPa(45psi). The lots having a pressure above 45psi the minimum size of the residential water service shall be 20mm diameter.

The results of the water analysis summarized in **Table 3** show a residual pressure of 41.9psi during peak hour demand, slightly less than 45psi. The existing 20mm water service does not meet the water design guidelines criteria for the minimum residential service size for lots having a residual pressure less than 45psi.

SANITARY SERVICING

There is an existing 300mm sanitary sewer in Aylmer Avenue that currently service the subject site. Refer to **Figure 3 Existing Services**. The exiting building service has been recently replaced with a new 150mm diameter PVC pipe from the back of the Aylmer Avenue sidewalk to the building.

The increase in peak sanitary flow from the two additional units is calculated to be 0.07 L/s. The total peak sanitary flow generated by the proposed triplex is calculated to be 0.11 L/s. The sanitary flow calculations are based on criteria provided in the City of Ottawa Sewer Design Guidelines. Refer to **Appendix B** for detailed calculations.

Since the addition of two units increases the peak flow by only 0.07 L/s from the existing condition, there are no concerns that the proposed development flows will have any adverse effects on the existing infrastructure.

STORM SERVICING AND STORMWATER MANAGEMENT

There is an existing 300mm storm sewer in Aylmer Avenue that currently service the subject site. Refer to **Figure 3 Existing Services**.

The existing house roof sheet drains towards the front and side yards. The roof drainage from the addition is directed towards the side yards via two downspouts at each side of the building. The surface drainage from the front half of the lot sheet drains towards Aylmer Street while the surface drainage from the back half of the lot sheet drains towards the back-property line. The foundation drainage from the addition is connected to the existing sump pump located in the basement of the exiting house and is being pump to the Aylmer Avenue storm sewer.

The stormwater management (quantity and quality control) is not required by the City of Ottawa for the proposed development.

CONCLUSION

Based on the foregoing, the existing municipal sewer and watermain infrastructure can adequately service the proposed development. The stormwater management is not required by the City of Ottawa.

NOVATECH

Prepared by:



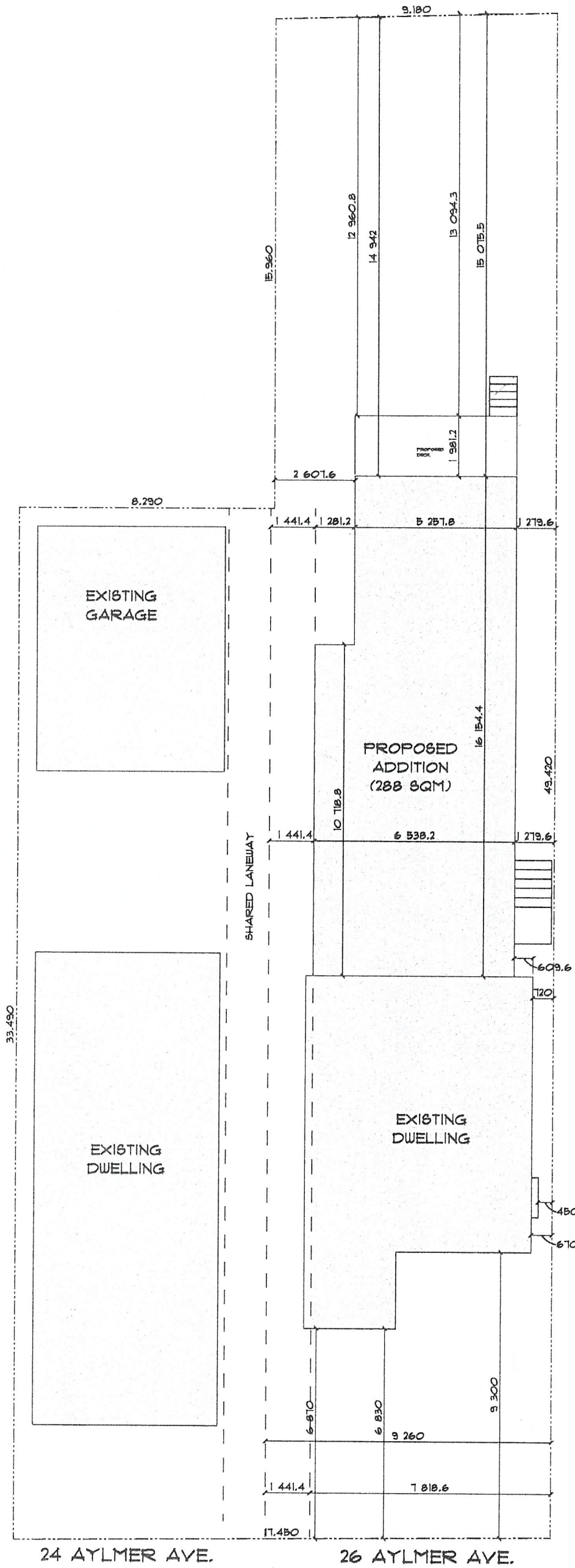
Miroslav Savic, P.Eng
Senior Project Manager | Land Development

List of Appendices:

Appendix A: Site Plan
Appendix B: Water and Sanitary Sewer Calculations

APPENDIX A

Site Plan



SITE COPY
City of Ottawa



03-29-17 FOR
STRUCTURAL REVIEW

SITE PLAN
SCALE: 1:150

I, Andre Theriault, Theriault design, Take responsibility for design work on behalf of a firm registered under Subsection 3.2.4 of division C, of the building code, I and the firm is registered in the appropriate class/categories.
Date: 11-MAR-2011

Signature of Designer:
Andre Theriault

Individual: 22968
Firm: 30798

Theriault Design
Architecture - Planification

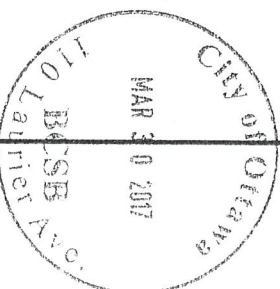
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| date | model |
|------|--------------|
| 3 | P. ENG. REV. |
| 2 | CON. DWS |
| 1 | PRELIM |

| model | drawing by | drawing no |
|---|------------|------------|
| PROPOSED ADDITION for DAVID PFAFF 26 AYLMER AVENUE, OTTAWA | A. SANFORD | 51 |
| PROJECT NO. | | 1 |
| 2011-878 | | |

City of Ottawa
Building Services Branch
APR 21 2017
Building Code Reviewed
Signature: *[Signature]*

City of Ottawa
Building Services Branch
APR 21 2017
Zoning/Planning
Signature: *[Signature]*



APPENDIX B

Water and Sanitary Sewer Calculations

FUS - Fire Flow Calculations

As per 1999 Fire Underwriter's Survey Guidelines



Engineers, Planners & Landscape Architects

Novatech Project #: 118092
 Project Name: 26 Aylmer Avenue
 Date: 11/29/2019
 Input By: Miroslav Savic
 Reviewed By:

Legend

Input by User

No Information or Input Required

Building Description: 3 - Storay Wood Frame Building

| Step | | | Input | | Value Used | Total Fire Flow (L/min) |
|---------------------------------|--|--|--------------------------------------|-------------|----------------|-------------------------|
| Base Fire Flow | | | | | | |
| 1 | Coefficient related to type of construction C | Construction Material | Wood frame | Yes | 1.5 | 1.5 |
| | | Ordinary construction | | | 1 | |
| | | Non-combustible construction | | | 0.8 | |
| | | Modified Fire resistive construction (2 hrs) | | | 0.6 | |
| | | Fire resistive construction (> 3 hrs) | | | 0.6 | |
| | | | | | | |
| 2 | A | Floor Area | Building Footprint (m ²) | 111 | | |
| | | Number of Floors/Storeys | 3 | | | |
| | | Area of structure considered (m ²) | | 333 | | |
| | F | Base fire flow without reductions | | | | 6,000 |
| | | $F = 220 C (A)^{0.5}$ | | | | |
| Reductions or Surcharges | | | | | | |
| 3 | (1) | Occupancy hazard reduction or surcharge | Non-combustible | | -25% | -15% |
| | | Limited combustible | Yes | | -15% | |
| | | Combustible | | | 0% | |
| | | Free burning | | | 15% | |
| | | Rapid burning | | | 25% | |
| | | | | | | |
| 4 | (2) | Sprinkler Reduction | Adequately Designed System (NFPA 13) | No | -30% | 0 |
| | | Standard Water Supply | No | | -10% | |
| | | Fully Supervised System | No | | -10% | |
| | | Cumulative Total | | 0% | | |
| | | | | | | |
| 5 | (3) | Exposure Surcharge (cumulative %) | North Side | 20.1 - 30 m | 10% | 3,315 |
| | | East Side | 3.1 - 10 m | 20% | | |
| | | South Side | 10.1 - 20 m | 15% | | |
| | | West Side | 3.1 - 10 m | 20% | | |
| | | Cumulative Total | | 65% | | |
| | | | | | | |
| Results | | | | | | |
| 6 | (1) + (2) + (3) | Total Required Fire Flow, rounded to nearest 1000L/min | | | L/min | 8,000 |
| | | (2,000 L/min < Fire Flow < 45,000 L/min) | | | or | L/s |
| | | | | | or | USGPM |
| 7 | Storage Volume | Required Duration of Fire Flow (hours) | | | Hours | 2 |
| | | Required Volume of Fire Flow (m ³) | | | m ³ | 960 |

26 AYLMER STREET

WATERMAIN ANALYSIS

WATER DEMAND

| | |
|-------------------------------------|-------------|
| NUMBER OF 3 BDR UNITS | 1 |
| PERSONS PER 3 BDR UNIT | 3.1 |
| NUMBER OF 4 BDR UNITS | 2 |
| PERSONS PER 4 BDR UNIT | 3.4 |
| TOTAL POPULATION | 10 |
| AVERAGE DAY DEMAND | 350 L/c/day |
| AVERAGE DAY DEMAND | 0.04 L/s |
| MAXIMUM DAY DEMAND (2.5 x avg. day) | 0.10 L/s |
| PEAK HOUR DEMAND (2.2 x max. day) | 0.22 L/s |

BOUNDARY CONDITIONS

| | |
|------------------|---------|
| MINIMUM HGL = | 105.0 m |
| MAXIMUM HGL = | 114.7 m |
| MAX DAY + FIRE = | 100.0 m |

PRESSURE TESTS

AVERAGE GROUND ELEVATION = 75.5 m

HIGH PRESSURE TEST = MAX HGL - AVG GROUND ELEV x 1.42197 PSI/m < 80 PSI

HIGH PRESSURE = **55.7 PSI**

LOW PRESSURE TEST = MIN HGL - AVG GROUND ELEV x 1.42197 PSI/m > 40 PSI

LOW PRESSURE = **41.9 PSI**

MAX DAY + FIRE FLOW TEST = MAX DAY + FIRE - AVG GROUND ELEV x 1.42197 PSI/m > 20 PSI

34.8 PSI

Miro Savic

From: Wu, John <John.Wu@ottawa.ca>
Sent: Thursday, January 2, 2020 10:52 AM
To: Miro Savic
Subject: RE: 26 Aylmer Ave - Boundary Conditions
Attachments: 26 Aylmer Jan 2020.pdf

Here it is :

The following are boundary conditions, HGL, for hydraulic analysis at 26 Aylmer (zone 1W) assumed to be connected to the 203mm on Aylmer (see attached PDF for location).

Minimum HGL = 105.0m

Maximum HGL = 114.7m

MaxDay + FireFlow (133 L/s) = 100.0m

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.

John

From: Miro Savic <m.savic@novatech-eng.com>
Sent: December 23, 2019 8:03 AM
To: Wu, John <John.Wu@ottawa.ca>
Subject: RE: 26 Aylmer Ave - Boundary Conditions

CAUTION: This email originated from an External Sender. Please do not click links or open attachments unless you recognize the source.

ATTENTION : Ce courriel provient d'un expéditeur externe. Ne cliquez sur aucun lien et n'ouvrez pas de pièce jointe, excepté si vous connaissez l'expéditeur.

Thanks

Miroslav Savic, P.Eng., Senior Project Manager | Land Development Engineering

NOVATECH Engineers, Planners & Landscape Architects

240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 x 265 | Fax: 613.254.5867

The information contained in this email message is confidential and is for exclusive use of the addressee.

Boundary Condition for 26 Aylmer

City of Ottawa²⁶

26 AYLMER STREET

SANITARY FLOW

PROPOSED 3-UNIT APPARTMENT BUILDING

| | |
|------------------------------|-------------|
| NUMBER OF 3 BDR UNITS | 1 |
| PERSONS PER 3 BDR UNIT | 3.1 |
| NUMBER OF 4 BDR UNITS | 2 |
| PERSONS PER 4 BDR UNIT | 3.4 |
| TOTAL POPULATION | 10 |
| AVERAGE DAILY FLOW | 280 L/c/day |
| PEAK FACTOR (HARMON FORMULA) | 3.53 |
| PEAK SANITARY FLOW | 0.11 L/s |

EXISTING SINGLE FAMILY DWELLING

| | |
|------------------------------------|-------------|
| NUMBER UNITS | 1 |
| PERSONS PER SINGLE FAMILY DWELLING | 3.4 |
| TOTAL POPULATION | 3.4 |
| AVERAGE DAILY FLOW | 280 L/c/day |
| PEAK FACTOR (HARMON FORMULA) | 3.56 |
| PEAK SANITARY FLOW | 0.04 L/s |