

*Stormwater Management - Grading & Drainage - Storm & Sanitary Sewers - Watermains*

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## SERVICING STUDY

MUNICIPAL SANITARY SEWER EXTENSION  
(CROSSING WOODROFFE AVENUE  
WEST FROM STONEWAY DRIVE  
NORTH ON WOODROFFE AVENUE &  
WEST ON DEERFOX DRIVE)

OTTAWA, ONTARIO

REPORT No. 20055-SAN

MARCH 17, 2022

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## 1.0 INTRODUCTION

This report describes the proposed extension of a municipal sanitary sewer to service properties that currently do not have access a municipal sanitary sewer. The proposed extension will connect to an existing 250 mm municipal sanitary in Stoneway Drive at an existing manhole approximately 40 m east of the Woodroffe Avenue intersection. The proposed extension is intended to service 3112, 3120 3130, 3150 and 3162 Woodroffe Avenue and 15 Deerfox Drive. The 3162 Woodroffe Avenue and 15 Deerfox Drive have the same owner and the intent is to service 3162 Woodroffe Avenue via 15 Deerfox Drive.

Also refer to drawings C-1 to C-9 prepared by D.B. Gray Engineering Inc.

## 2.0 SANITARY SERVICE

3112 Woodroffe Avenue is 0.40 ha in area, is currently a commercial use and is assumed to remain as such:

As per;

- i. the City of Ottawa Sewer Design Guidelines for commercial peaking factor; and
- ii. City of Ottawa Technical Bulletin ISTB-2018-01 for the consumption rates and infiltration allowance;

the sanitary flow rate was calculated to be 0.72 L/s.

3120 Woodroffe Avenue is 0.39 ha in area and is assumed to be a future commercial development:

As per;

- i. the City of Ottawa Sewer Design Guidelines for commercial peaking factor; and
- ii. City of Ottawa Technical Bulletin ISTB-2018-01 for the consumption rates and infiltration allowance;

the sanitary flow rate was calculated to be 0.70 L/s.

3130 Woodroffe Avenue is 0.38 ha in area and is proposed to have a dental clinic and four semi-detached dwellings (as per a current Site Plan Control application):

As per;

- i. the City of Ottawa Sewer Design Guidelines for the residential population and commercial peaking factor;
- ii. City of Ottawa Technical Bulletin ISTB-2018-01 for the consumption rates, Harmon Formula correction factor and infiltration allowance; and
- iii. the Harmon Formula for the residential peaking factor;

the sanitary flow rate was calculated to be 0.52 L/s.

3150 Woodroffe Avenue is 0.35 ha in area and currently occupied by a single dwelling, but the building is proposed to be renovated and change of use to a commercial use is proposed (as per a soon to be submitted Site Plan Control application):

As per;

- i. the City of Ottawa Sewer Design Guidelines for commercial peaking factor; and
- ii. City of Ottawa Technical Bulletin ISTB-2018-01 for the consumption rates and infiltration allowance;

the sanitary flow rate was calculated to be 0.63 L/s.

3162 Woodroffe Avenue and 15 Deerfox Drive is 1.27 ha in area and currently occupied by single dwellings on each property. The owner does not currently have any specific plans for the properties but it is expected to a residential development with up to 300 apartment units:

As per;

- i. the City of Ottawa Sewer Design Guidelines for the residential population;
  - ii. City of Ottawa Technical Bulletin ISTB-2018-01 for the consumption rates, Harmon Formula correction factor and infiltration allowance; and
  - iii. the Harmon Formula for the residential peaking factor;
- the post-development sanitary flow rate was calculated to be 5.96 L/s.

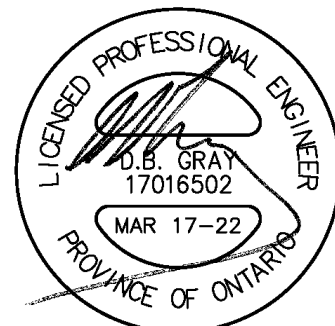
Six of the seven pipe segments of the proposed 250 mm municipal sanitary sewer will be at a minimum 0.24% slope to achieve a minimum velocity of 0.60 m/s (and a 29.44 L/s capacity). The Deerfox Drive segment will be at 0.60% slope (0.94 m/s - 46.56 L/s capacity). Each pipe segment will be at 5% to 30% capacity. The design sanitary flow in the last pipe segment is 8.74 L/s (30% of its capacity). The increase in sanitary flows of 8.74 L/s is expected to have an acceptable impact on the existing 250 mm municipal sanitary sewer in Stoneway Drive (at 0.33% - 34.53 L/s capacity).

Refer to calculations in Appendix A.

### 3.0 CONCLUSIONS

1. The design sanitary flow rate will be adequately handled by the proposed municipal sanitary sewer system.
2. The design sanitary flow rate is expected to have an acceptable impact acceptable impact on the existing 250 mm municipal sanitary sewer in Stoneway Drive.

Prepared by D.B. Gray Engineering Inc.



NOT VALID UNLESS  
SIGNED & DATED

## **APPENDIX A**

### SANITARY SERVICING



SANITARY SEWER CALCULATIONS

Stormwater Management - Grading & Drainage - Storm & Sanitary Sewers - Watermains

700 Long Point Circle  
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Extension of Municipal Sanitary Sewer  
Woodroffe Ave / Deerfox Dr / Stoneway Dr  
Ottawa, Ontario

February 7, 2022

Residential Average Daily Flow: 280 L/capita/day  
Commercial Average Daily Flow: 28,000 L/ha/day  
Institutional Average Daily Flow: 28,000 L/ha/day  
Light Industrial Average Daily Flow: 35,000 L/ha/day  
Heavy Industrial Average Daily Flow: 55,000 L/ha/day

Residential Peaking Factor: Harmon Formula  
Harmon Formula Correction Factor: 0.8  
Commercial Peaking Factor: 1.5  
Institutional Peaking Factor: 1.5  
Industrial Peaking Factor: Ministry of the Environment

Cumulative Infiltration Allowance: 0.33 L/s/ha Manning's Roughness Coefficient: 0.013

| Location                                             |          | Residential      |                  |           |           |           |           |           |              |            |              | Non-Residential |                   |                    |              | Infiltration           |                   |                    | Q            | Sewer Data   |                    |               |                                            |                            |              |                   |                                        |                       |                    |
|------------------------------------------------------|----------|------------------|------------------|-----------|-----------|-----------|-----------|-----------|--------------|------------|--------------|-----------------|-------------------|--------------------|--------------|------------------------|-------------------|--------------------|--------------|--------------|--------------------|---------------|--------------------------------------------|----------------------------|--------------|-------------------|----------------------------------------|-----------------------|--------------------|
|                                                      |          | Individual       |                  |           |           |           |           |           | Cumulative   |            |              |                 | Individual        |                    |              |                        | Cumulative        | Individual         | Cumulative   |              | Total              | Length<br>(m) | Nominal<br>Diameter<br>(mm)                | Actual<br>Diameter<br>(mm) | Slope<br>(%) | Velocity<br>(m/s) | Q <sub>Full</sub><br>Capacity<br>(L/s) | Q / Q <sub>Full</sub> |                    |
|                                                      |          | Single<br>Family | Semi<br>Detached | Duplex    | Apartment |           |           |           | Area<br>(ha) | Population | Area<br>(ha) | Population      | Peaking<br>Factor | Flow Rate<br>(L/s) | Area<br>(ha) | Daily Flow<br>L/ha/day | Peaking<br>Factor | Flow Rate<br>(L/s) | Area<br>(ha) | Area<br>(ha) | Flow Rate<br>(L/s) |               |                                            |                            |              |                   |                                        |                       | Flow Rate<br>(L/s) |
| From                                                 | To       | ppu = 3.4        | ppu = 2.7        | ppu = 2.3 | ppu = 1.4 | ppu = 2.1 | ppu = 3.1 | ppu = 1.8 |              |            |              |                 |                   |                    |              |                        |                   |                    |              |              |                    |               |                                            |                            |              |                   |                                        |                       |                    |
|                                                      |          |                  |                  |           |           |           |           |           |              |            |              |                 |                   |                    |              |                        |                   |                    |              |              |                    |               |                                            |                            |              |                   |                                        |                       |                    |
| DRAINAGE AREA A (3162 Woodroffe Ave / 15 Deerfox Dr) |          |                  |                  |           |           |           |           |           |              |            |              |                 |                   |                    |              |                        |                   |                    |              |              |                    |               |                                            |                            |              |                   |                                        |                       |                    |
|                                                      | MH-SA.7  |                  |                  |           |           |           |           | 300       | 1.27         | 540        | 1.27         | 540             | 3.17              | 5.54               |              |                        |                   | 0.00               | 1.27         | 1.27         | 0.42               | 5.96          |                                            |                            |              |                   |                                        |                       |                    |
|                                                      |          |                  |                  |           |           |           |           |           |              |            |              |                 |                   |                    |              |                        |                   |                    |              |              |                    |               |                                            |                            |              |                   |                                        |                       |                    |
| DRAINAGE AREA B (3150 Woodroffe Ave)                 |          |                  |                  |           |           |           |           |           |              |            |              |                 |                   |                    |              |                        |                   |                    |              |              |                    |               |                                            |                            |              |                   |                                        |                       |                    |
|                                                      | MH-SA.7  |                  |                  |           |           |           |           |           | 0            | 0.00       |              | 0               | 3.20              | 0.00               | 0.35         | 28,000                 | 4.5               | 0.51               | 0.35         | 0.35         | 0.12               | 0.63          |                                            |                            |              |                   |                                        |                       |                    |
|                                                      |          |                  |                  |           |           |           |           |           |              |            |              |                 |                   |                    |              |                        |                   |                    |              |              |                    |               |                                            |                            |              |                   |                                        |                       |                    |
| DRAINAGE AREA C (3130 Woodroffe Ave)                 |          |                  |                  |           |           |           |           |           |              |            |              |                 |                   |                    |              |                        |                   |                    |              |              |                    |               |                                            |                            |              |                   |                                        |                       |                    |
|                                                      | MH-SA.7  |                  | 4                |           |           |           |           |           | 0.19         | 11         | 0.19         | 11              | 3.20              | 0.11               | 0.19         | 28,000                 | 4.5               | 0.28               | 0.38         | 0.38         | 0.13               | 0.52          |                                            |                            |              |                   |                                        |                       |                    |
|                                                      |          |                  |                  |           |           |           |           |           |              |            |              |                 |                   |                    |              |                        |                   |                    |              |              |                    |               |                                            |                            |              |                   |                                        |                       |                    |
| DRAINAGE AREA D (Deerfox Dr R.O.W.)                  |          |                  |                  |           |           |           |           |           |              |            |              |                 |                   |                    |              |                        |                   |                    |              |              |                    |               |                                            |                            |              |                   |                                        |                       |                    |
| MH-SA.7                                              | MH-SA.4  |                  |                  |           |           |           |           |           | 0            | 1.46       | 551          | 3.16            | 5.64              | 0.12               |              |                        |                   | 0.79               | 0.12         | 2.12         | 0.70               | 7.13          | 59.3                                       | 250                        | 251          | 0.60              | 0.94                                   | 46.56                 | 0.15               |
|                                                      |          |                  |                  |           |           |           |           |           |              |            |              |                 |                   |                    |              |                        |                   |                    |              |              |                    |               |                                            |                            |              |                   |                                        |                       |                    |
| DRAINAGE AREA E (3112 Woodroffe Ave)                 |          |                  |                  |           |           |           |           |           |              |            |              |                 |                   |                    |              |                        |                   |                    |              |              |                    |               |                                            |                            |              |                   |                                        |                       |                    |
|                                                      | MH-SA.6  |                  |                  |           |           |           |           |           | 0            | 0.00       | 0            | 3.20            | 0.00              | 0.40               | 28,000       | 4.5                    | 0.58              | 0.40               | 0.40         | 0.13         | 0.72               |               |                                            |                            |              |                   |                                        |                       |                    |
|                                                      |          |                  |                  |           |           |           |           |           |              |            |              |                 |                   |                    |              |                        |                   |                    |              |              |                    |               |                                            |                            |              |                   |                                        |                       |                    |
| DRAINAGE AREA F (3120 Woodroffe Ave)                 |          |                  |                  |           |           |           |           |           |              |            |              |                 |                   |                    |              |                        |                   |                    |              |              |                    |               |                                            |                            |              |                   |                                        |                       |                    |
|                                                      | MH-SA.6  |                  |                  |           |           |           |           |           | 0            | 0.00       | 0            | 3.20            | 0.00              | 0.39               | 28,000       | 4.5                    | 0.57              | 0.39               | 0.39         | 0.13         | 0.70               |               |                                            |                            |              |                   |                                        |                       |                    |
|                                                      |          |                  |                  |           |           |           |           |           |              |            |              |                 |                   |                    |              |                        |                   |                    |              |              |                    |               |                                            |                            |              |                   |                                        |                       |                    |
| DRAINAGE AREA G (Woodroffe Ave R.O.W.)               |          |                  |                  |           |           |           |           |           |              |            |              |                 |                   |                    |              |                        |                   |                    |              |              |                    |               |                                            |                            |              |                   |                                        |                       |                    |
| MH-SA.6                                              | MH-SA.5  |                  |                  |           |           |           |           |           | 0            | 0.00       | 0            | 3.20            | 0.00              | 0.40               |              |                        |                   | 1.15               | 0.40         | 1.19         | 0.39               | 1.54          | 105.5                                      | 250                        | 251          | 0.24              | 0.60                                   | 29.44                 | 0.05               |
| MH-SA.5                                              | MH-SA.4  |                  |                  |           |           |           |           |           | 0            | 0.00       | 0            | 3.20            | 0.00              | 0.00               |              |                        |                   | 1.15               | 0.00         | 1.19         | 0.39               | 1.54          | 13.2                                       | 250                        | 251          | 0.24              | 0.60                                   | 29.44                 | 0.05               |
|                                                      |          |                  |                  |           |           |           |           |           |              |            |              |                 |                   |                    |              |                        |                   |                    |              |              |                    |               |                                            |                            |              |                   |                                        |                       |                    |
| DRAINAGE AREA H (Woodroffe Ave R.O.W.)               |          |                  |                  |           |           |           |           |           |              |            |              |                 |                   |                    |              |                        |                   |                    |              |              |                    |               |                                            |                            |              |                   |                                        |                       |                    |
| MH-SA.4                                              | MH-SA.3  |                  |                  |           |           |           |           |           | 0            | 0.00       | 551          | 3.16            | 5.64              | 0.09               |              |                        |                   | 1.94               | 0.09         | 3.39         | 1.12               | 8.70          | 15.5                                       | 250                        | 251          | 0.24              | 0.60                                   | 29.44                 | 0.30               |
| MH-SA.3                                              | MH-SA.2  |                  |                  |           |           |           |           |           | 0            | 0.00       | 551          | 3.16            | 5.64              | 0.00               |              |                        |                   | 1.94               | 0.00         | 3.39         | 1.12               | 8.70          | 10.5                                       | 250                        | 251          | 0.24              | 0.60                                   | 29.44                 | 0.30               |
| MH-SA.2                                              | MH-SA.1  |                  |                  |           |           |           |           |           | 0            | 0.00       | 551          | 3.16            | 5.64              | 0.00               |              |                        |                   | 1.94               | 0.00         | 3.39         | 1.12               | 8.70          | 24.9                                       | 250                        | 251          | 0.24              | 0.60                                   | 29.44                 | 0.30               |
| DRAINAGE AREA K (Stoneway Dr R.O.W.)                 |          |                  |                  |           |           |           |           |           |              |            |              |                 |                   |                    |              |                        |                   |                    |              |              |                    |               |                                            |                            |              |                   |                                        |                       |                    |
| MH-SA.1                                              | Existing |                  |                  |           |           |           |           |           | 0            | 0.00       | 551          | 3.16            | 5.64              | 0.09               |              |                        |                   | 1.94               | 0.09         | 3.48         | 1.15               | 8.74          | 35.3                                       | 250                        | 251          | 0.24              | 0.60                                   | 29.44                 | 0.30               |
|                                                      |          |                  |                  |           |           |           |           |           |              |            |              |                 |                   |                    |              |                        |                   |                    |              |              |                    |               |                                            |                            |              |                   |                                        |                       |                    |
|                                                      |          |                  |                  |           |           |           |           |           |              |            |              |                 |                   |                    |              |                        |                   |                    |              |              |                    |               | EXISTING 250 SANITARY SEWER IN STONEWAY DR |                            |              |                   |                                        |                       |                    |
|                                                      |          |                  |                  |           |           |           |           |           |              |            |              |                 |                   |                    |              |                        |                   |                    |              |              |                    |               | 35.3                                       | 250                        | 251          | 0.33              | 0.70                                   | 34.53                 |                    |

## **APPENDIX B**

### **CITY OF OTTAWA SERVICING STUDY CHECKLIST**

## **CITY OF OTTAWA SERVICING STUDY CHECKLIST**

### **GENERAL CONTENT**

Executive Summary: **N/A**

Date and revision number of report: **Included**

Location map and plan showing municipal address, boundary and layout of proposed development: **Included**

Plan showing site and location of all existing services: **Included**

Development statistics, land use, density, adherence to zoning and Official Plan and reference to applicable watershed and subwatershed plans: **N/A**

Summary of Pre-Application Consultation meetings with City of Ottawa and other approval agencies: **N/A**

Confirmation of conformance with higher level studies: **Included**

Statement of objectives and servicing criteria: **Included**

Identification of existing and proposed infrastructure available in the immediate area: **Included**

Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development: **N/A**

Concept level master grading plan to confirm existing and proposed grades in the proposed development: **Included**

Identification of potential impacts of proposed piped services on private services on adjacent lands: **N/A**

Proposed phasing of proposed development: **N/A**

Reference to geotechnical studies: **Included**

All preliminary and formal site plan submissions should have the following information:

Metric scale: **Included**

North arrow: **Included**

Key plan: **Included**

Name and contact information of applicant and property owner: **N/A**

Property limits: **Included**

Existing and proposed structures and parking areas: **Included**

Easements, road widenings and right-of-ways: **Included**

Street names: **Included**



## **WATER SERVICING**

Confirmation of conformance with Master Servicing Study: **N/A**

Availability of public infrastructure to service proposed development: **N/A**

Identification of system constraints: **N/A**

Identification of boundary conditions: **N/A**

Confirmation of adequate domestic supply: **N/A**

Confirmation of adequate fire flow: **N/A**

Check of high pressures: **N/A**

Definition of phasing constraints: **N/A**

Address reliability requirements: **N/A**

Check on necessity of a pressure zone boundary modification: **N/A**

Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for proposed development: **N/A**

Description of proposed water distribution network: **N/A**

Description of required off-site infrastructure to service proposed development: **N/A**

Confirmation that water demands are calculated based on the City of Ottawa Water Design Guidelines: **N/A**

Provision of a model schematic showing the boundary conditions locations, streets, parcels and building locations: **N/A**

## **SANITARY SERVICING**

Summary of proposed design criteria: **Included**

Confirmation of conformance with Master Servicing Study: **N/A**

Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the City of Ottawa Sewer Design Guidelines: **N/A**

Description of existing sanitary sewer available for discharge of wastewater from proposed development: **Included**

Verification of available capacity in downstream sanitary sewer and/or identification of upgrades necessary to service proposed development: **N/A**

Calculations related to dry-weather and wet-weather flow rates: **Included**

Description of proposed sewer network: **Included**

Discussion of previously identified environmental constraints and impact on servicing: **N/A**

Impacts of proposed development on existing pumping stations or requirements for new pumping station: **N/A**

Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity: **N/A**

Identification and implementation of emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding: **N/A**

Special considerations (e.g. contamination, corrosive environment): **N/A**

## **STORMWATER MANAGEMENT & STORM SERVICING**

Description of drainage outlets and downstream constraints: **N/A**

Analysis of available capacity in existing public infrastructure: **N/A**

Plan showing subject lands, its surroundings, receiving watercourse, existing drainage pattern and proposed drainage pattern: **N/A**

Water quantity control objective: **N/A**

Water quality control objective: **N/A**

Description of the stormwater management concept: **N/A**

Setback from private sewage disposal systems: **N/A**

Watercourse and hazard lands setbacks: **N/A**

Record of pre-consultation with the Ministry of the Environment, Conservation and Parks and the Conservation Authority having jurisdiction on the affected watershed: **N/A**

Confirmation of conformance with Master Servicing Study: **N/A**

Storage requirements and conveyance capacity for minor events (5-year return period) and major events (100-year return period): **Included**

Identification of watercourses within the proposed development and how watercourses will be protected or if necessary altered by the proposed development: **N/A**

Calculation of pre-development and post-development peak flow rates: **N/A**

Any proposed diversion of drainage catchment areas from one outlet to another: **N/A**

Proposed minor and major systems: **N/A**

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: **N/A**

Identification of potential impacts to receiving watercourses: **N/A**

Identification of municipal drains: **N/A**

Description of how the conveyance and storage capacity will be achieved for the proposed development: **Included**

100-year flood levels and major flow routing: **N/A**

Inclusion of hydraulic analysis including hydraulic grade line elevations: **N/A**

Description of erosion and sediment control during construction: **N/A**

Obtain relevant floodplain information from Conservation Authority: **N/A**

Identification of fill constraints related to floodplain and geotechnical investigation: **N/A**

## **APPROVAL AND PERMIT REQUIREMENTS**

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: **N/A**

Application for Certificate of Approval (CofA) under the Ontario Water Resources Act: **N/A**

Changes to Municipal Drains: **N/A**

Other permits (e.g. National Capital Commission, Parks Canada, Public Works and Government Services Canada, Ministry of Transportation): **N/A**

## **CONCLUSIONS**

Clearly stated conclusions and recommendations: **Included**

Comments received from review agencies: **N/A**

Signed and stamped by a professional Engineer registered in Ontario: **Included**