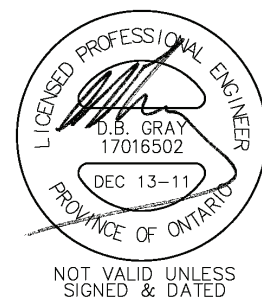


SERVICING BRIEF

406-408 Bank Street  
Ottawa, Ontario

Report No. 10015-SB

December 13, 2011



**D. B. GRAY ENGINEERING INC.**

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## SERVICING BRIEF

406-408 Bank Street  
Ottawa, Ontario

The following Servicing Brief is a description of the services of a proposed five-storey residential building with ground floor commercial development located on 303 sq.m. of land 406-408 Bank Street at the corner of Florence Street in Ottawa.

Refer to drawing SG-1 (Revision 6: Dec 13-11), prepared by D. B. Gray Engineering Inc.

### Water Supply for Fire Fighting:

There is an existing fire hydrant located in the sidewalk on the west side of Bank Street, approximately 41m from the main entrance.

A fire demand of 3,600 L/min (60 L/sec) at 138 kPa is required as per "Required Minimum Water Supply Flow Rate" as calculated using the Ontario Building Code - Appendix A - Article A-3.2.5.7 "Water Supply for Fire Fighting".

To determine if an adequate water supply for firefighting is available, the boundary conditions, based on the City of Ottawa computer simulation of the water distribution system in this area, are required.

### Water Service:

The proposed building will be sprinklered. To service the sprinklers a 150mm water service is proposed. The proposed water service will connect to a proposed 203mm municipal watermain in Florence Street

Based on the AWWA water flow demand curve, an estimated water pressure at the meter of 414 kPa (60 psi), the peak demand is expected to be 314 L/min (5.24 l/s - 83 USgpm). The AWWA method calculates the instantaneous demand and is used to size the water service. This peak demand will produce a low velocity of 0.3m/s in the proposed 150mm water service connection.

Based on the City of Ottawa and Ministry of the Environment Design Guidelines the daily average flow is 0.12 l/s with a maximum daily and maximum hourly demand of 1.17 and 1.76 L/min respectively. To determine water pressure under these demands, the boundary conditions, based on the City of Ottawa computer simulation of the water distribution system in this area, are required.

In summary, we request the boundary conditions for Bank Street / Florence Street based on the following:

- Average daily demand: 0.12 l/s.
- Maximum daily demand: 1.17 l/s.
- Maximum hourly daily demand: 1.76 l/s
- Fire Flow demand: 60 l/s (3,600 l/min)

### Sanitary Service:

Based on the City of Ottawa Sewer Design Guidelines for a residential property (16 one bedroom apartment units – 1.4 persons per unit – 350 l/person/day – 4.0 peaking factor) and 227 sq.m. of commercial 50,000 l/ha / day; 1.5 peaking factor); and a 0.28 l/s/ha infiltration flow) the post development flow is calculated to be 0.39 l/s. This flow will be adequately handled by the proposed sanitary sewer service (150mm @ 1% - 15.9 l/s capacity).

The proposed sanitary sewer service will connect to a proposed 750 x 900mm brick municipal combined sewer in Florence Street. The increase in sanitary flows contributing to this sewer is expected to have a negligible impact.

### Stormwater:

Infrastructure Approvals staff advised that the following stormwater management criteria are to be used: The release rate for post-development storm events is equal to or less than the flow produced by a five year storm using a runoff coefficient of 0.40 and a 20 minute time of concentration. (See Stormwater Management Report No. 10015-SWM, dated December 13, 2011, prepared by D. B. Gray Engineering Inc.)

The flowrate from the flow control roof drains during a one in five year storm event will produce a peak flow of 1.34 l/s which will be adequately handled by a proposed storm sewer connection (150mm @ 1.0% - 15.9 l/s capacity).

The unrestricted flowrate resulting from one in five year storm event will produce a peak flow of 7.9 l/s which would also be adequately handled by a proposed storm sewer connection.

The proposed storm sewer service will connect to a proposed 750 x 900mm brick municipal combined sewer in Florence Street. The increase in storm flows contributing to this sewer is expected to have a negligible impact

Since the stormwater management facility will be discharging into a combined sewer, a Certificate of Approval from the Ministry of the Environment will be required.

Conclusions:

1. Boundary conditions are required to determine if there is an adequate water supply for fire fighting.
2. Boundary conditions are required to determine if the existing water pressure is adequate for the proposed development.
3. Boundary conditions are required to determine if the water pressure can be above 80 psi and if a pressure reducing valve is required.
4. The proposed water service connection is adequately sized to serve the development.
5. The expected sanitary sewage flow will be adequately handled by the proposed sanitary sewer service connection.
6. The increase in sanitary flows contributing to the existing municipal combined sewer is expected to have a negligible impact.
7. The stormwater quantity control is based on the criteria release rate for post-development storm events is equal to or less than the flow produced by a five year storm using a runoff coefficient of 0.40 and a 20 minute time of concentration
8. The restricted and unrestricted flowrate produced by a one in five year storm event and will be adequately handled by a proposed storm sewer.
9. The increase in stormwater flows contributing to the existing municipal combined sewer is expected to have a negligible impact.
10. It is expected that a Ministry of Environment Certificate of Approval will be required because we are connecting into a combined sewer.

406-408 Bank Street, Ottawa  
Ottawa, Ontario

## Water Supply for Fire-Fighting Calculations:

A fire demand of 3,600 L/min is required as per "Required Minimum Water Supply Flow Rate" as calculated using the Ontario Building Code - Appendix A - Article A-3.2.5.7 "Water Supply For Fire Fighting".

Fire Protection Water Supply  $Q = KVS_{Tot}$

$$S_{Tot} = 1.0 + S_{Side1} + S_{Side2} + S_{Side3} + S_{Side4}$$

Spatial Coefficient		Exposure Distance m	
$S_{Side1}$	0.5	0.0	(to north property line)
$S_{Side2}$	0.05	9.5	(to center line of road - Bank St)
$S_{Side3}$	0.07	9.3	(to center line of road - Florence St)
$S_{Side4}$	0.5	0.0	(to west property line)
$S_{Tot}$	2.12		

### Commercial

K (Water Supply Coefficient)

17 As per A-3.2.5.7. Table 1 (Group E Occupancy / Non-combustible construction with fire separations and fire resistance ratings as per OBC 3.2.2.)

V (Building Volume)

	Area sq.m.	Average Height m	Volume cu.m.
Ground Floor	217	3.95	<u>856</u>
			856

$$Q = KVS_{Tot}$$

$$Q_1 = 30,860 \text{ L}$$

### Residential

K (Water Supply Coefficient)

10 As per A-3.2.5.7. Table 1 (Group C Occupancy / Non-combustible construction with fire separations and fire resistance ratings as per OBC 3.2.2.)

V (Building Volume)

	Area sq.m.	Average Height m	Volume cu.m.
Basement	276	2.87	792
Ground Floor	84	3.95	331
2nd Floor	301	2.77	833
3rd Floor	301	2.77	833
4th Floor & Loft	301	5.23	<u>1,573</u>
			4,363 cu.m.

$$Q = KVS_{Tot}$$

$$Q_2 = 92,488 \text{ L}$$

$$Q_{Tot} = Q_1 + Q_2$$

$$Q_{Tot} = 123,348$$

Required Minimum Water Supply Flow Rate      3,600 L/min      60 L/sec  
(As per A-3.2.5.7. Table 2)

## Water Demand 406-408 Bank Street

13-Dec-11

### WATER FIXTURE VALUE

	No.	F.V.	Total	
Bathtub	0	8	0	16 Residential Units
Toilet - tank	16	4	64	
Toilet - flush valve	0	35	0	
Lavs.	16	1.5	24	
Urinal - pedestal flush valve	0	35	0	
Urinal - wall flush valve	0	16	0	
Shower	0	2.5	0	
K. Sink	16	2.2	35.2	
Dishwasher	16	2	32	
Clothes Washer	16	6	96	
Commercial Sink	0	4	0	
J. Sink	0	4	0	
Commercial Dishwasher	0	4	0	
Commercial Washer	0	4	0	
Hose 1/2 in	0	5	0	

251.2

Peak Demand (fig 4-2 or 4-3) 35 Usgpm

	No.	F.V.	Total	
Bathtub	0	8	0	2 Commercial Units
Toilet - tank	4	4	16	
Toilet - flush valve	0	35	0	
Lavs.	4	1.5	6	
Urinal - pedestal flush valve	0	35	0	
Urinal - wall flush valve	4	16	64	
Shower	0	2.5	0	
K. Sink	2	2.2	4.4	
Dishwasher	0	2	0	
Clothes Washer	0	6	0	
Commercial Sink	0	4	0	
J. Sink	0	4	0	
Commercial Dishwasher	0			
Commercial Washer	0			
Hose 1/2 in	0	5	0	

90.4

Peak Demand (fig 4-2 or 4-3) 48 Usgpm

TOTAL Peak Demand 83 Usgpm

Pressure @ Meter 414 kPa 60 psi (assumed)  
 Pressure Factor (table 4-1) 1.00

Peak Demand 83 Usgpm

Irrigation - hose 1/2 in 0 Usgpm (includes pressure factor)  
 (assume no hose bibs operating)

TOTAL PEAK DEMAND 314 l/min 83 Usgpm 5.24 l / sec

Nominal Size 5.9 in 150 mm  
1.0 ft/s 0.3 m/s

### DAILY AVERAGE

Residential 350 litres / person / day  
22 persons (based on 16 units and 1.4 persons per unit)  
5.4 l / min 0.09 l / sec 1.4 Usgpm

Assume 1/2 Comercial is Retail 5.0 litres / sq.m.  
109 sq.m.  
0.4 l / min 0.01 l / sec 0.1 Usgpm

Assume 1/2 Comercial is a Food Outlet 20.5 litres / sq.m.  
109 sq.m.  
1.6 l / min 0.03 l / sec 0.4 Usgpm

TOTAL DAILY AVERAGE 7.4 l / min 0.12 l / sec 1.9 Usgpm  
10,624 l / day  
30 equivalent persons (350 l / day)

MAXIMUM 9.5 (Peaking Factor for a equivalent population: Table 3-3  
 MOE Design Guidelines for Drinking-Water Systems)  
70.0 l / min 1.17 l / sec 18.5 Usgpm

MAXIMUM 14.3 (Peaking Factor for a equivalent population: Table 3-3  
 MOE Design Guidelines for Drinking-Water Systems)  
105.4 l / min 1.76 l / sec 27.8 Usgpm





## City of Ottawa Servicing Study Checklist

### General Content

**Executive Summary (for large reports only):** not applicable

**Date and revision number of the report:** see page 1 of Servicing Brief

**Location map and plan showing municipal address, boundary, and layout of proposed development:** see drawings SG-1

**Plan showing the site and location of all existing services:** see drawings SG-1

**Development statistics, land use, density, adherence to zoning and official plan, and reference to applicable subwatershed and watershed plans that provide context to which individual developments must adhere:** not applicable

**Summary of Pre-consultation Meetings with City and other approval agencies:** not available

**Reference and confirm conformance to higher level studies and reports ( Master Servicing Studies, Environmental Assessments, Community Design Plans), or in the case where it is not in conformance, the proponent must provide justification and develop a defensible design criteria:** not applicable

**Statement of objectives and servicing criteria:** see page 2 of Servicing Brief

**Identification of existing and proposed infrastructure available in the immediate area:** see drawings SG-1

**Identification of Environmentally Significant Areas, watercourses and Municipal Drains potentially impacted by the proposed development ( Reference can be made to the Natural Heritage Studies, if available).** see drawings SG-1

**Concept level master grading plan to confirm existing and proposed grades in the development and drainage, soil removal and fill constraints, and potential impacts to neighbouring properties. This is also required to confirm that the proposed grading will not impede existing major system flow paths:** not applicable

**Identification of potential impacts of proposed piped services on private services (such as wells and septic fields on adjacent lands) and mitigation required to address potential impacts:** not applicable

**Proposed phasing of the development, if applicable:** not applicable

**Reference to geotechnical studies and recommendations concerning servicing:** see Note 1.5 on drawing SG-1

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

- **Metric scale:** included
- **North arrow:** included
  - **(including construction North):** not included
- **Key Plan:** included

**Name and contact information of applicant and property owner:** see note 1.8 on drawing SG-1

- **Property limits:** included
  - **including bearings and dimensions:** not included
- **Existing and proposed structures and parking areas:** included
- **Easements, road widening and rights-of-way:** included
- **Adjacent street names:** included

### Development Servicing Report: Water

**Confirm consistency with Master Servicing Study, if available:** not applicable

**Availability of public infrastructure to service proposed development:** see page 2 of Servicing Brief

**Identification of system constraints:** see page 2 of Servicing Brief

**Confirmation of adequate domestic supply and pressure:** see page 2, 3 & 5 of Servicing Brief



**Confirmation of adequate fire flow protection and confirmation that fire flow is calculated as per the Fire Underwriter's Survey. Output should show available fire flow locations throughout the development:** see page 2, 3 & 4 of Servicing Brief

**Provide a check of high pressures. If pressure is found to be high, an assessment is required to confirm the application of pressure reducing valves:** see page 3 of Servicing Brief

**Definition of phasing constraints. Hydraulic modeling is required to confirm servicing for all defined phases of the project including the ultimate design:** not applicable

**Address reliability requirements such as appropriate location of shut-off valves:** not applicable

**Check on the necessity of a pressure zone boundary modification:.** not applicable

**Reference to water supply analysis to show that major infrastructure is capable of delivering sufficient water for the proposed land use. This includes data that shows that the expected demands under average day, peak hour and fire flow conditions provide water within the required pressure range:** not applicable

**Description of the proposed water distribution network, including locations of proposed connections to the existing systems, provisions for necessary looping, and appurtenances (valves, pressure reducing valves, valve chambers, and fire hydrants) including special metering provisions:** not applicable

**Description of off-site required feeder mains, booster pumping stations, and other water infrastructure that will be ultimately required to service proposed development, including financing, interim facilities, and timing of implementation:** not applicable

**Confirmation that water demands are calculated based on the City of Ottawa Design Guidelines:** see page 2 of Servicing Brief

**Provision of a model schematic showing the boundary conditions locations, streets, parcels, and building locations for reference:** not applicable

#### **Development Servicing Report: Wastewater**

**Summary of proposed design criteria:** see page 2 of Servicing Brief

**(Note: Wet-weather flow criteria should not deviate from the City of Ottawa Sewer Design Guidelines. Monitored flow data from relatively new infrastructure cannot be used to justify capacity requirements for proposed infrastructure):** not applicable

**Confirm consistency with Master Servicing Study and /or justification for deviations:** not applicable

**Consideration of local conditions that may contribute to extraneous flows that are higher than the recommended flows in the guidelines. This includes groundwater and soil conditions, and age and conditions of sewers:** not applicable

**Descriptions of existing sanitary sewer available for discharge of wastewater from proposed development:** see page 2 of Servicing Brief

**Verify available capacity in downstream sanitary sewer and / or identification of upgrades necessary to service the proposed development. (Reference can be made to previously completed Master Servicing Study if applicable):** not applicable

**Calculations related to dry-weather and wet-weather flow rates from the development in standard MOE sanitary sewer design table (Appendix C) format.** see page 6 of Servicing Brief

**Description of proposed sewer network including sewers, pumping stations, and forcemains:** see page 2 of Servicing Brief

**Discussion of previously identified environmental constraints and impact on servicing (environmental constraints are related to limitations imposed on the development in order to preserve the physical condition of watercourses, vegetation, soil cover, as well as protecting against water quantity and quality):** not applicable

**Pumping stations: impacts of proposed development on existing pumping stations or requirements for new pumping station to service development:** not applicable

**Forcemain capacity in terms of operational redundancy, surge pressure and maximum flow velocity:** not applicable

**Identification and implementation of the emergency overflow from sanitary pumping stations in relation to the hydraulic grade line to protect against basement flooding:** not applicable

**Special considerations such as contamination, corrosive environment etc:** not applicable

#### **Development Servicing Report: Stormwater Checklist**

**Description of drainage outlets and downstream constraints including legality of outlets (i.e. municipal drain, right-of-way, watercourse, or private property):** see page 2 of Servicing Brief

**Analysis of available capacity in existing public infrastructure.** not applicable

**A drawing showing the subject lands, its surroundings, the receiving watercourse, existing drainage patterns, and proposed drainage pattern:** see drawing SG-1

**Water quality control objective (e/g/ controlling post-development peak flows to pre-development level for storm events ranging from the 2 or 5 year event (dependent on the receiving sewer design) to 100 year return period); if other objectives are being applied, a rationale must be included with reference to hydrologic analyses of the potentially affected subwatersheds, taking into account long-term cumulative effects:** see Stormwater Management Report No. 1015-SWM, dated December, 2011, prepared by D. B. Gray Engineering Inc.

**Water Quality control objective (basic, normal or enhanced level of protection based on the sensitivities of the receiving watercourse) and storage requirements:** see Stormwater Management Report No. 1015-SWM, dated December, 2011, prepared by D. B. Gray Engineering Inc.

**Descriptions of the references and supporting information.**

**Set-back from private sewage disposal systems.** not applicable

**Watercourse and hazard lands setbacks:** not applicable

**Record of pre-consultation with the Ontario Ministry of Environment and the Conservation Authority that has jurisdiction on the affected watershed:** The pre-application consultation record is not yet been issued

**Confirm consistency with sub-watershed and Master Servicing Study, if applicable study exists:** not applicable

**Storage requirements (complete with calculations) and conveyance capacity for minor events (1:5 year return period) and major events (1:100 year return period).** see drawing SG-1 and Stormwater Management Report No. 1015-SWM, dated December, 2011, prepared by D. B. Gray Engineering Inc.

**Identification of watercourses within the proposed development and how watercourses will be protected, or , if necessary, altered by the proposed development with applicable approvals.** see drawing SG-1 and Stormwater Management Report No. 1015-SWM, dated December, 2011, prepared by D. B. Gray Engineering Inc.

**Calculate pre and post development peak flow rates including a description of existing site conditions and proposed impervious areas and drainage catchments in comparison to existing conditions:** see Stormwater Management Report No. 1015-SWM, dated December, 2011, prepared by D. B. Gray Engineering Inc.

**Any proposed diversion of drainage catchment areas from one outlet to another. :** not applicable

**Proposed minor and major systems including locations and sizes of stormwater trunk sewers, and stormwater management facilities. :** not applicable

**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:** not applicable

**Identification of potential impacts to receiving watercourses:** see Stormwater Management Report No. 1015-SWM, dated December, 2011, prepared by D. B. Gray Engineering Inc.

**Identification of municipal drains and related approval requirements. :** not applicable

**Descriptions of how the conveyance and storage capacity will be achieved for the development:** see page 2 of Servicing Brief and Stormwater Management Report No. 1015-SWM, dated December, 2011, prepared by D. B. Gray Engineering Inc.

**100 year flood levels and major flow routing to protect proposed development from flooding for establishing minimum building elevations (MBE) and overall grading:**

**Inclusion of hydraulic analysis including hydraulic grade line elevations. :** not applicable

**Description of approach to erosion and sediment control during construction for the protection of receiving watercourses of drainage corridors:** see notes 2.1 to 2.3 on drawing SG-1

**Identification of floodplains – proponent to obtain relevant floodplain information from the appropriate Conservation Authority. The proponent may be required to delineate floodplains elevations to the satisfaction of the Conservation Authority if such information is not available or if information does not match current:** not applicable

**Identification of fill constraints related to floodplain and geotechnical investigation. :** not applicable

#### **Approval and Permit Requirements: Checklist**

**The Servicing Study shall provide a list of applicable permits and regulatory approvals necessary for the proposed development as well as the relevant issues affecting each approval. The approval and permitting shall include but not be limited to the following:**

**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 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:** not applicable

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

**Changes to Municipal Drains. :** not applicable

**Other permits (National Capital commission, Parks Canada, public Works and Government Services Canada, Ministry of transportation etc.) :** not applicable

#### **Conclusion Checklist**

**Clearly stated conclusions and recommendations:** see page 3 of Servicing Brief

**Comments received from review agencies including the City of Ottawa and information on how the comments were addressed. Final sign-off from the responsible reviewing agency.**

**All draft and final reports shall be signed and stamped by a professional Engineer registered in Ontario:** included