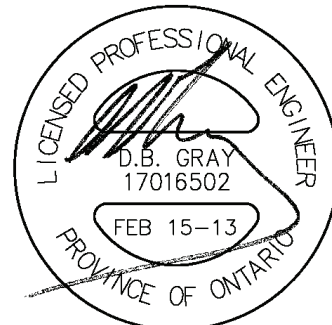


SERVICING BRIEF

Mutchmor Public School Addition
185 Fifth Avenue
Ottawa, Ontario

Report No. 12073-SB

February 15, 2013



NOT VALID UNLESS
SIGNED & DATED

D. B. GRAY ENGINEERING INC.

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SERVICING BRIEF

Mutchmor Public School Addition 185 Fifth Avenue Ottawa, Ontario

The following Servicing Brief is a description of the existing services of a public school located on 0.52 ha of land at 185 Fifth Avenue (also having frontage on Fourth Avenue and Lyon Street). A two storey addition is proposed.

Refer to drawing SG-1 & SG-2 (Revision 2: Feb 15-13), and Stormwater Management Report No. 12073-SWM (February 15, 2013) prepared by D. B. Gray Engineering Inc.

Water Supply for Fire Fighting:

There are four existing fire hydrants in the municipal right-of-way near the school. Two are on the north side of Fourth Avenue. One is near the Lyon Street intersection approximately 26m from the Fourth Street main entrance. The other is approximately 82m to the west of the Fourth Street main entrance. Another two are on the south side of Fifth Avenue. One is near the Ralph Street intersection approximately 26m from the Fourth Street main entrance. The other is approximately 63m to the east of the Fourth Street main entrance.

The original building built in 1894 and the 1911 and 1920 additions and have a standpipe system with 38mm hose connections but are not sprinklered. The 1980 gymnasium addition is sprinklered in the basement portion of the gymnasium addition only and has a standpipe system. The new addition will be sprinklered with no standpipe.

A preliminary calculation by the mechanical engineer (Goodkey, Weedmark & Associates Limited), as calculated as per NFPA13, indicates that the maximum required flowrate (including the inside outside hose allowance) is 500 USgpm (31.5 l/s).

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

Water Service:

There are two existing water service connections serving the school. An existing 100mm water service connecting to a 400mm municipal watermain in Fourth Avenue feeds the fire protection system. An existing 38mm water service connecting to a 400mm municipal watermain in Fifth Avenue feeds the domestic water system. However the existing 38mm service is not sized to accommodate the new addition. The existing domestic water plumbing system will be modified so that all water requirements (fire protection and domestic use) for the existing building and new addition will be served by the 100mm service connection. The 38mm water service will be abandoned.

Based on the AWWA water flow demand curve and an estimated water pressure at the meter of 414 kPa (60 psi), the peak demand is expected to be 10.2 l/s (162 USgpm). The AWWA method calculates the instantaneous demand and is used to size the water service. This peak demand will produce an acceptable velocity of 1.3 m/s in the existing 100mm water service connection.

Based on the City of Ottawa Design Guidelines the daily average consumption rate for a school is 70 litres per student per day. However the subject school is elementary school without a cafeteria and without showers, as such 30 litres per student per day is appropriate. At a capacity enrollment of 580 students the daily average demand is calculate to be 0.5 l/s. Based on this figure and the MOE Design Guidelines, a maximum daily demand of 4.4 l/s and maximum hourly demand 6.7 l/s can be expected.

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 the Somerset Street West / Booth Street based on the following:

- Average daily demand: 0.5 l/s.
- Maximum daily demand: 4.4 l/s.
- Maximum hourly daily demand: 6.7 l/s
- Fire Flow demand: 31.5 l/s
- Max. Day + Fire Flow demand: 35.9 l/s

Sanitary Service:

Based on the City of Ottawa Sewer Design Guidelines for a school without a cafeteria and without showers (30 litre / student / day; 1.5 peaking factor; and a 0.28 litre / sec / ha infiltration flow) and with an existing enrollment of 300 students, the peak flow is calculated to be 0.30 l/s. With an existing capacity of 390 students the peak flow is 0.35 l/s. With the proposed addition and a capacity student enrollment of 580 students the flow is calculated to be 0.45 l/s.

The existing sanitary sewer service is 200mm in diameter, is assumed to have at least a 1% slope and connects to a 450mm municipal combined sewer in Fourth Avenue. The maximum peak post development flow of 0.45 l/s will be adequately handled by the existing sanitary sewer service (34.2 l/s capacity at 1%). The proposed sanitary service will connect to an existing 450mm municipal combined sewer. The increase between the existing condition (300 student enrollment) and the proposed 580 student capacity is 0.15 l/s. This increase in sanitary flows contributing to the existing combined sewer is expected to have a negligible impact given its capacity of 165.6 l/s.

Stormwater:

Infrastructure Approvals staff advised that the stormwater quantity control measures are to be based on the criteria that the release rate, for post-development storm events, from the roof of the proposed addition 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. 12073-SWM, dated February 15, 2013, prepared by D. B. Gray Engineering Inc.)

The existing storm sewer service is 150mm in diameter, is assumed to have at least a 1% slope and connects to a 450mm municipal combined sewer in Fourth Avenue. Currently only the gymnasium roof drains to this existing connection. During the 5-year event the peak flow from the gymnasium roof is 9.4 l/s. The proposed addition will also drain to this connection. Each of two roof drains on the addition roof will be flow control type. During the 5-year event the peak restricted flow from the addition roof is 2.6 l/s. Therefore the peak flow drain to the existing 150mm storm sewer connection is 12.0 l/s (9.4 + 2.6 l/s). This post development flow will be adequately handled by the existing storm sewer service (15.9 l/s capacity at 1%). The 2.6 l/s increase in stormwater flows contributing to the existing combined sewer is expected to have a negligible impact given its capacity of 165.6 l/s.

There is also an existing storm sewer system that drains a 1430 sq.m. area consisting mainly an asphalted playground and part of an asphalted parking area. This system connects to a 600mm municipal combined sewer in Fifth Avenue. During the 5-year event the peak flow from this area is currently 36.8 l/s. This existing storm sewer system will be abandoned. A proposed storm sewer system connect to the Fifth Avenue combined sewer will drain 440 sq.m. During the 5-year event the peak flow from the proposed storm sewer system is 6.9 l/s. The 81% decrease in flow is expected to have a positive impact on the combined sewer system.

Since the stormwater management facility and storm sewer system discharges to combined sewers it is expected that Ministry of Environment Environmental Compliance Approval (ECA) will be required.

Conclusions:

1. Boundary conditions are required to determine if there is an adequate water supply for fire fighting.
2. We require the boundary conditions 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 that the release rate for post-development storm events is equal to or less than the flow produced by the existing conditions.
8. The restricted flowrate produced by a one in five year storm event will be adequately handled by a proposed storm sewer.
9. The stormwater flows contributing to the existing municipal combined sewers are expected to have a negligible or positive impact.
10. It is expected that a Ministry of Environment Certificate of Approval will be required because of the storm connection to a combined sewer.

Mutchmor Public School Ottawa, Ontario Water Demand

WATER FIXTURE VALUE
(AWWA Manual M22 - Sizing Water Service Lines and Meters)

	No.	F.V.	Total
Bathtub	0	8	0
Tiolet - tank	0	4	0
Tiolet - flush valve	43	35	1505
Lavs.	67	1.5	100.5
Urinal - pedestal flush valve	20	35	700
Urinal - wall flush valve	0	16	0
Shower	1	2.5	2.5
K. Sink	0	2.2	0
Dishwasher	0	2	0
Clothes Washer	1	6	6
Commercial Sink	0	4	0
J. Sink	4	4	16
Commercial Dishwasher	0	4	0
Commercial Washer	0	4	0
Hose 1/2 in	0	5	0

2330

Peak Demand (fig 4-2 or 4-3 AWWA M22) 150 USgpm

Pressure @ Meter 414 kPa
Pressure Factor (table 4-1 AWWA M22) 60 psi (assumed)
1.00

Peak Demand 150 USgpm

Irrigation - hose 1/2 in 2
(assume no hose bibs operating) 12 USgpm (includes pressure factor)

TOTAL PEAK DEMAND 613 l/min 162 USgpm 10.22 l/sec

Nominal Size 3.9 in
4.3 ft/s 100 mm
1.3 m/s

DAILY AVERAGE

30 litres / student / day (no cafeteria / no showers)

580 students

30.4 l/min 0.51 l/sec 8.0 USgpm

17,400 l/day

50 equivalent persons (350 l / day)

MAXIMUM DAILY DEMAND

8.7 (Peaking Factor for a equivalent population of 80: Table 3-3 MOE Design Guidelines for Drinking-Water Systems)

265.9 l/min 4.43 l/sec 70.2 USgpm

MAXIMUM HOURLY DEMAND

13.2 (Peaking Factor for a equivalent population of 80: Table 3-3 MOE Design Guidelines for Drinking-Water Systems)

400.3 l/min 6.67 l/sec 105.8 USgpm

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STORM SEWER COMPUTATION FORM

RATIONAL METHOD Q = 2.78 A I R FIVE YEAR EVENT

n = 0.013

PROJECT: Mutchmor PS Addition, Ottawa

Designed By: DBG

Date: 15-Feb-13

Page: 1 of 1

LOCATION		AREA (ha)			Individual 2.78 A R	Accum. 2.78 A R	Time of Conc. (min)	Rainfall Intensity I (mm/hr)	Peak Flow Q (l/s)	Type of Pipe	Dia. Actual (mm)	Dia. Nom. (mm)	Slope (%)	Length (m)	SEWER DATA				COMMENTS
FROM	TO	R = 0.9	R = 0.70	R = 0.2											R = 0.9	Capacity (l/s)	Velocity (m/s)	Time of Flow (min)	
EXISTING CONDITIONS - ASPHALT PARKING AREA AND PLAYGROUND																			
PROPOSED STORM SEWER SYSTEM																			
CB-1	CB/MH-2	0.010			0.025	0.025	10.0	104	2.6	PVC SDR 35	254.0	250	0.430	14.0	40.7	0.80	0.3	0.06	
CB/MH-2	CB/MH-3	0.003	0.007	0.002	0.014	0.039	10.3	103	4.0	PVC SDR 35	254.0	250	0.430	16.4	40.7	0.80	0.3	0.10	
CB/MH-3	MH-4	0.005	0.014	0.003	0.029	0.068	10.6	101	6.9	PVC SDR 35	254.0	250	0.430	2.2	40.7	0.80	0.0	0.17	
MH-4	5TH AVE				0.000	0.068	10.7	101	6.9	PVC SDR 35	254.0	250	0.430	9.9	40.7	0.80	0.2	0.17	
EXISTING 600mm COMBINED SEWER IN FIFTH AVENUE																			
EXISTING CONDITIONS - GYMNASIUM ROOF																			
EXISTING ROOF	4TH AVE			0.036	0.090	0.090	10.0	104	9.4		152.4	150	1.000		15.9	0.87		0.59	
PROPOSED CONDITIONS - GYMNASIUM ROOF + RESTRICTED FLOW FROM PROPOSED ADDITION ROOF																			
EXISTING + ADDITION ROOF	4TH AVE			0.117	0.293	0.293	10.0	104	30.6		152.4	150	1.000		15.9	0.87		1.92	UNRESTRICTED FLOW
									12.0		152.4	150	1.000		15.9	0.87		0.75	RESTRICTED FLOW FROM ADDITION ROOF (2.7 l/s)
EXISTING 450mm COMBINED SEWER IN FOURTH AVENUE																			
											457.2	450	0.310		165.6	1.01			

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 and SG-2

Plan showing the site and location of all existing services: see drawings SG-1 and SG-2

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 applicable

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 1 of Servicing Brief

Identification of existing and proposed infrastructure available in the immediate area: see drawings SG-1 and SG-2

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). not applicable

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-2

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:** not included
- **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 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 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 2 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 3 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 3 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 5 of Servicing Brief

Description of proposed sewer network including sewers, pumping stations, and forcemains: see page 3 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 3 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

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

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: an email has been sent to MOE but 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 & SG-2 and Stormwater Management Report

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 & SG-2 and Stormwater Management Report

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

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

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 3 of Servicing Brief

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 2.4 on drawing SG-2

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: the Rideau Conservation Authority has not been contacted

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