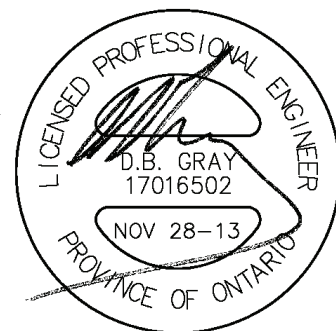


SERVICING BRIEF

1234 Prestone Drive
Ottawa, Ontario

Report No. 13036-SWM

November 13, 2013
Revised November 20, 2013
Revised November 28, 2013



NOT VALID UNLESS
SIGNED & DATED

D. B. GRAY ENGINEERING INC.

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

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SERVICING BRIEF

1234 Prestone Drive
Ottawa, Ontario

The following Servicing Brief is a description of the services of a church property located on 9,114 sq.m. of land at 1234 Prestone Drive. Three additions totaling 351 sq.m. are proposed for the existing 584 sq.m. church.

Refer to drawing SG-1 & SG-2 prepared by D. B. Gray Engineering Inc.

Water Supply for Fire Fighting:

There are two existing fire hydrants in the municipal right-of-way near the proposed development. One is on the opposite side of Prestone Drive approximately 60m from the main entrance. The other is near the Prestone Drive / Kennedy Lane intersection, located approximately 75m from the main entrance.

A fire demand of 90 l/s (5,400 L/min) 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".

Based on computer model simulation of the boundary conditions received from the city, the HGL during 90 l/s fire flow conditions (plus maximum day flow) at this location on Prestone Drive is 127.3 m which calculates to be 391 kPa (57 psi). Since the pressure is above 138 kPa (20 psi) there is an adequate water supply for fire fighting.

Water Service:

An existing 38mm water service connects to an existing 400mm municipal watermain in Prestone Drive.

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 3.2 l/s (50 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 2.9 m/s in the existing 38mm water service connection.

Based on the City of Ottawa Design Guidelines the daily average consumption rate for an institutional development is 28,000 litres per day per hectare. Using this figure the daily average flow for the 0.911 hectare subject property is 0.9 l/s. Based on this flowrate and peaking factors of 1.5 and 1.8 for the maximum daily and hourly demand respectively, as per the City of Ottawa Design Guidelines, a maximum daily demand of 1.3 l/s and maximum hourly demand 1.6 l/s can be expected.

To determine the water pressure under these demands, the boundary conditions, based on the City of Ottawa computer simulation of the water distribution system in the area, are required. In summary, the boundary conditions were requested at this location on Prestone Drive based on the following:

- Average Daily Demand: 0.9 l/s.
- Maximum Daily Demand: 1.3 l/s.
- Maximum Hourly Demand: 1.6 l/s
- Fire Flow Demand: 90 l/s
- Maximum Daily + Fire Flow Demand 91.3 l/s

Based on a computer model simulation City of Ottawa staff provided the peak hour boundary conditions of 126.3 m. Based on a water meter elevation of 88.9m, the static pressure at the water meter during peak hour conditions is expected to be 366 kPa (53

psi). The maximum HGL 130.2m, also provided by City of Ottawa staff, indicates that the water pressure at the meter is not expected to be over 405 kPa (59 psi); as such pressure reducing valves will not be required.

Sanitary Service:

Based on the City of Ottawa Sewer Design Guidelines for an institutional property (50,000 l / ha / day; 1.5 peaking factor; and a 0.24 l/s infiltration flow) the post development flow is calculated to be 1.05 l/s.

This flow will be adequately handled by the existing sanitary sewer service (150mm @ 1% - 15.9 l/s capacity). The existing sanitary service will connect to an existing 525mm municipal sanitary sewer (300mm @ 0.20% - 200.6 l/s capacity) in Prestone Drive.

The 1.05 l/s sanitary flows contributing to the existing 525mm sanitary sewer is expected to have a negligible impact given its capacity of 200.6 l/s.

Stormwater:

The stormwater quantity control measures are 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. (See Stormwater Management Report No. 13036-SWM prepared by D. B. Gray Engineering Inc.)

There is an existing 200mm storm sewer connection and a proposed 250mm storm sewer connection.

The restricted flowrate (through the proposed ICDs in CB-1 & CB-2) resulting from one in five year storm event will produce a peak flow of 30.8 l/s, which is 37% greater than capacity of the existing storm sewer connection (200mm @ 1% - 34.2 l/s capacity). It is estimated that the existing storm sewer connection is sized for restricted flow of the 2-year storm event. It is proposed that the existing 200mm storm connection will remain.

The restricted flowrate (through the proposed ICD in CB/MH-6) resulting from one in five year storm event will produce a peak flow of 6.9 l/s, which will be adequately handled by a proposed storm sewer connection (300mm @ 0.34% - 58.8 l/s capacity).

The restricted flowrate off the site resulting from one in five year storm event will produce a peak flow of 53.9 l/s which is expected to have a negligible impact given the capacity of the municipal storm sewer in Prestone Drive (750 mm @ 0.44% - 770.4 l/s capacity).

Conclusions:

1. There is an adequate water supply for fire fighting.
2. The existing water pressure is adequate for the proposed development.
3. Since it is calculated that the water pressure is less than 80 psi, pressure reducing valves are not required.
4. The existing water service connection is adequately sized to serve the development.
5. The expected sanitary sewage flow will be adequately handled by the existing sanitary sewer service connection.
6. The increase in sanitary flows contributing to the existing 525mm municipal sanitary 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 two year storm event the will be adequately handled by the existing storm sewer connection.
9. The restricted flowrate produced by a one in five year storm event the will be adequately handled by a proposed storm sewer connection.

1234 Prestone Drive Ottawa, Ontario

Water Supply for Fire-Fighting Calculations:

A fire demand of 9,000 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	11.5	(to south property line)
S_{Side2} 0	36.0	(to center line of road)
S_{Side3} 0	25.0	(to center line of road)
S_{Side4} 0	42.0	(to east property line)
S_{Tot} 1		

K (Water Supply Coefficient)

18 As per A-3.2.5.7. Table 1 (Group A2 Occupancy / Combustible construction with fire separations and fire resistance ratings as per OBC 3.2.2.)

V (Building Volume) 9,278 cu.m.

$$Q = KVS_{Tot}$$

$$Q = 167,004 \text{ L}$$

Required Minimum Water Supply Flow Rate 5,400 L/min **90 L/sec**
 (As per A-3.2.5.7. Table 2)

Elevation at Fire Hydrant: 87.42 m ASL

Static Pressure at Fire Hydrant

91.3 l/s MAX DAY + FIRE FLOW: 127.3 m ASL **57** psi **391** kPa

1234 Prestone Drive Ottawa, Ontario Water Demand

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

	No.	F.V.	Total
Bathtub	0	8	0
Toilet - tank	8	4	32
Toilet - flush valve	0	35	0
Lavs.	8	1.5	12
Urinal - pedestal flush valve	0	35	0
Urinal - wall flush valve	2	16	32
Shower	0	2.5	0
K. Sink	2	2.2	4.4
Dishwasher	0	2	0
Clothes Washer	0	6	0
Commercial Sink	2	4	8
J. Sink	0	4	0
Commercial Dishwasher	2	4	8
Commercial Washer	0	4	0
Hose 1/2 in	0	5	0

96.4

Peak Demand (fig 4-2 or 4-3 AWWA M22) 50 USgpm

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

Peak Demand 50 USgpm

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

TOTAL PEAK DEMAND 189 l/min 50 USgpm 3.2 l / sec
Nominal Size 1.5 in 38 mm
9.2 ft/s 2.8 m/s

INSTITUTIONAL: 28000 l / gross ha / day (as per Ottawa Design Guidelines)
0.91 ha (land area)
25508 l / day
8 hour day
53 l / min 0.9 l / sec 14 USgpm
434 persons (based on number of seats)

MAXIMUM DAILY DEMAND 1.5 (Peaking Factor as per Ottawa Design Guidelines for Water Distribution)
80 l / min 1.3 l / sec 21 USgpm

MAXIMUM HOURLY DEMAND 1.8 (Peaking Factor as per Ottawa Design Guidelines for Water Distribution)
96 l / min 1.6 l / sec 25 USgpm

Elevation of Water Meter: 88.94 m ASL
Finish Floor Elevation: 88.04 m ASL

Static Pressure at Water Meter

PEAK HOUR HGL: 126.3 m ASL 53 psi 366 kPa
MAXIMUM HGL: 130.2 m ASL 59 psi 405 kPa

Subject:	RE: St Helen's Church 1234 Prestone Dr
From:	Sevigny, John (John.Sevigny@ottawa.ca)
To:	dbgray@rogers.com;
Date:	Tuesday, November 19, 2013 1:18:44 PM

Hi Doug,

Below are the boundary conditions for the site.

MAX HGL = 130.2m
PKHR HGL = 126.3m
MXDY+Fire = 127.3m

Regards,

John Sevigny, C.E.T.
Project Manager - Infrastructure Approvals
Development Review - Suburban Services Branch - East Unit
Planning & Growth Management Dept.
Infrastructure Services and Community Sustainability
110 Laurier Avenue West
4th floor
Ottawa, ON K1P 1J1
tel.: (613) 580-2424 ext.14388
fax: (613) 560-6006
e-mail: john.sevigny@ottawa.ca
Mail Code: 01-14

From: DOUGLAS GRAY [mailto:dbgray@rogers.com]
Sent: November 15, 2013 12:18 PM
To: Sevigny, John
Subject: Re: St Helen's Church 1234 Prestone Dr

Hi John

The revised water demand calculations are attached.

For private development the city accepts the OBC method for calculating the fire flow.

Please provide the boundary conditions for the following expected demands.

Average Daily Demand: 0.9 l/s.
Maximum Daily Demand: 1.3 l/s.
Maximum Hourly Demand: 1.6 l/s
Fire Flow Demand: 90 l/s
Maximum Daily + Fire Flow Demand 91.6 l/s

Regards, Doug

D. B. GRAY ENGINEERING INC.
Stormwater Management - Grading & Drainage - Storm & Sanitary Sewers - Watermains

700 Long Point Circle
Ottawa, Ontario K1T 4E9

Tel: 613-425-8044
dbgray@rogers.com

Summary of Pre-consultation with City of Ottawa

From: Lebrun, Julie (Planning) [mailto:Julie.Lebrun@ottawa.ca]
Sent: June-18-13 2:11 PM
To: Ralph Vandenberg
Cc: Terrence Leversedge (kestrelaerospaceresearch@gmail.com); Kathy Pearce (pgts@rogers.com)
Subject: RE: 1234 Prestone Drive - Church expansion

Hi Ralph,

Please see my responses in **red** below.

Thanks,

Julie

From: Ralph Vandenberg [mailto:ralph@vwarchitects.ca]
Sent: June 12, 2013 4:32 PM
To: Lebrun, Julie (Planning)
Cc: Terrence Leversedge (kestrelaerospaceresearch@gmail.com); Kathy Pearce (pgts@rogers.com)
Subject: RE: 1234 Prestone Drive - Church expansion

Hi Julie: I'm trying to assist the church in developing their budget and properly determining figures related to the Site Plan Control process. Attached is a more updated plan than what we discussed in the Pre-Application meeting.

Could you verify:

1. Is there is an existing Site Plan Agreement on the property? **Yes**
2. If there is, is this application a " Revision - Manager Approval, Public Consultation" or is the addition (+/-5,000ft²) to the existing (6,287ft²) building, or can this be a simple Manager or Staff approval with no Public Consultation?
3. Is the additional Engineering Design Review and Inspection Fee applicable for this project? **Yes they are applicable**

Thanks,
Ralph

Vandenberg & Wildeboer Architects Inc.
Ralph Vandenberg – B. Arch, OAA, MRAIC, LEED AP
160 Flamborough Way, Kanata, Ontario, K2K 3H9
Ph 613 287-0144 x200 Fx 613 271-8609
www.vwarchitects.ca | [Download Vcard](#)

From: Lebrun, Julie (Planning) [mailto:Julie.Lebrun@ottawa.ca]
Sent: May-30-13 11:11 AM
To: Ralph Vandenberg; 'kestrelaerospaceresearch@gmail.com'
Cc: Sevigny, John; Yousfani, Asad
Subject: 1234 Prestone Drive - Church expansion

Good morning,

As discussed in our pre-consultation meeting on May 28th, the applicant will be submitting a site plan application with the City to add a new Hall, nursery, classrooms and administration offices to the existing church as well as additional parking. As a follow-up I have provided links to the by-law regarding aisle provisions, landscaping provisions for parking areas and the provisions for the I1B zone.

Links to the Consolidated Zoning By-law:

1) Aisle provisions

<http://ottawa.ca/en/residents/laws-licenses-and-permits/laws/city-ottawa-zoning-law/zoning-law-2008-250-consolidation-43>

2) Landscaping provisions for parking areas

<http://ottawa.ca/en/residents/laws-licenses-and-permits/laws/city-ottawa-zoning-law/zoning-law-2008-250-consolidation-45>

3) I1B zone provisions

<http://ottawa.ca/en/residents/laws-licenses-and-permits/laws/city-ottawa-zoning-law/zoning-law-2008-250-consolidation-65>

You will be required to submit the following with your site plan application:

Site Plan

Landscape Plan

Color Architectural Elevation drawings

Tree Conservation Report (a tree cutting permit will be required for any on site tree removal – contact Mark Richardson (x 23839)

Phase 1 ESA

As part of their engineering submission we will require the following report/studies as part of their application:

Site Servicing Brief:

- The report is to follow the City's Servicing Study guidelines which can be found at the following link: <http://ottawa.ca/en/development-application-review-process-0/servicing-study-guidelines-development-applications>
- Prior to submitting the servicing report the consultant should contact me and request boundary conditions for the water service design. The consultant will need to provide the type of development, fire flow required, average day demand, maximum day demand and maximum hour demand.
- We have confirmed with infrastructure management that there are no concerns with existing sanitary capacity within the right-of-way therefore the consultant will only need to confirm that the existing service size is adequate for their expansion.
- The storm water management design is to be calculated using a post-development release rate equivalent to the pre-development release rate for the 1:5 year storm. All flows volumes up to and including the 1:100 year storm, above the 1:5 year pre-development flow rate, are to be controlled/stored on site.

Geotechnical Brief:

- Containing detailed information on geotechnical matters and recommendations (i.e. pavement, foundation, bedding construction etc.). The report is to follow the City's Geotechnical Reporting Guidelines which can be found at <http://www.ottawa.ca/cs/groups/content/@webottawa/documents/pdf/mdaw/mtm4/~edisp/cap137602.pdf>

Exterior Site Lighting Letter

- This requirement was not mentioned in the pre-consult however it would be appreciated if we could have it at the time of submission. That being said, we would not deem the application incomplete if it was the only thing missing from the submission.

- The letter is to be certified by a qualified engineer confirming the site lighting design a) meets the criteria for Full Cut-off (Sharp cut-off) Classification, as recognized by the Illuminating Engineering Society of North America (IESNA or IES) AND b) the site lighting spillage will be minimal (i.e. 0.5 foot-candle is normally the maximum allowable spillage).

Engineering Drawings:

- The following are the engineering plans that are required with the submission. The link below outlines the requirements for the plans
http://ottawa.ca/en/city_hall/planningprojectsreports/planning/dev_review_process/guide/servicing_grading/index.html
 - o Site Servicing Plan
 - o Grading and Drainage Plan
 - o Erosion and Sediment Control Plan (can be combined with the grading plan)

A couple items to make note of are:

- A Closed Circuit Television (CCTV) inspection will be required in order to re-use the existing services. This will be required prior to site plan approval.
- All existing and proposed parking areas are to have barrier curbs.

The transportation engineer will require the following:

-A Transportation Brief (TB) is required: More details on the format / analysis methodologies to complete a TB can be found under Appendix C, page # 25 of the October 2006 Transportation Impact Assessment Guidelines.

Following are **some** of the elements the required TB will document in it.

- Identify any turning lanes to serve the access points along public road(s);
- Determine the appropriate curb radii, daylight triangles, and storage length at the entrances;
- Determine the appropriate width of access points and their spacing. The Private Approach BY-LAW needs to be referred to (http://www.ottawa.ca/residents/bylaw/a_z/private_approach/index_en.html);

-A Noise Study is required: May 2010 City of Ottawa Environmental Noise Control Guidelines should be referred to complete the required study.

If you have any further questions, please do not hesitate to contact us.

Regards,

Julie Lebrun, MCIP, RPP
Planner / Urbaniste
Planning and Growth Management Department/
Service de l'urbanisme et gestion de la croissance
City of / Ville d'Ottawa
110, avenue Laurier Avenue West / Ouest,
4th Floor / 4ième étage
Ottawa, ON K1P 1J1
' 580-2424 ext. 27816
7580-2576
8 Julie.Lebrun@ottawa.ca
Mail Code / Courrier interne : 01-14

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: see page 10 to 12 of Servicing Brief

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). see drawings SG-1 and SG-2

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 available
- **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 & 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 2 & 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 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 & SG-2

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: not applicable

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 2.5 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: 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