

Servicing Report – 244
Fountain Place

Project # 160401234



Prepared for:
TC United Group

Prepared by:
Stantec Consulting Ltd.

October 14, 2016

Sign-off Sheet

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Introduction
October 14, 2016

1.0 INTRODUCTION

TC United Group have commissioned Stantec Consulting Ltd. to prepare a servicing study in support of the Site Plan Control submission of the proposed development located at 244 Fountain Place (formerly 244 Rideau Place). The site is situated southwest of the intersection of Rideau Street and Fountain Place within the City of Ottawa. The proposed infill development would replace a vacant property with two three-storey apartment buildings comprising a total of 22 residential units. The conceptual site development plan used for the purpose of this servicing brief is shown as **Figure 1**. The 0.072ha (0.177 acre) site is currently vacant property. The site is presently zoned residential fifth density, subzone B, which permits the proposed development plan. The intent of this report is to provide a servicing scenario for the site that is free of conflicts, provides on-site servicing in accordance with City of Ottawa design guidelines, and utilizes the existing local infrastructure in accordance with the guidelines outlined per consultation with City of Ottawa staff.

Figure 1: Location Plan



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Background
October 14, 2016

2.0 BACKGROUND

Documents referenced in preparation of the design for the 244 Fountain Place development include:

- Geotechnical Investigation – Proposed Residential Building – 244 Rideau Place, Paterson Group Consulting Engineers, April 24, 2016.
- City of Ottawa Sewer Design Guidelines, City of Ottawa, October 2012.
- City of Ottawa Design Guidelines – Water Distribution, City of Ottawa, July 2010.

3.0 WATER SUPPLY SERVICING

3.1 BACKGROUND

The proposed development comprises two three-storey residential apartment buildings, complete with associated infrastructure and access areas. The site is located on the west side of Fountain Place immediately south of the intersection with Rideau Street. The site will be serviced via a private 150mm watermain connecting to the existing 150mm dia. watermain within the Fountain Place ROW at the eastern boundary of the site. The property is located within the City's Pressure Zone 1W. Ground elevations at on-site buildings are approximately 62.15 – 62.50m. Under normal operating conditions, hydraulic gradelines vary from approximately 105.4m to 118.1m as confirmed through boundary conditions as provided by the City of Ottawa (see **Appendix A.3**).

3.2 WATER DEMANDS

Water demands for the development were estimated using the Ministry of Environment's Design Guidelines for Drinking Water Systems (2008). A daily rate of 350 L/cap/day has been applied for the population of the proposed site. Population densities have been assumed as 1.8 pers./unit based on a general apartment type unit layout. See **Appendix A.1** for detailed domestic water demand estimates.

The average day demand (AVDY) for the entire site was determined to be 0.16 L/s. The maximum daily demand (MXDY) is 2.5 times the AVDY (residential property), which equals 0.40 L/s. The peak hour demand (PKHR) is 2.2 times the MXDY, totaling 0.88 L/s.

Ordinary construction was considered in the assessment for fire flow requirements per the FUS Guidelines. The FUS Guidelines indicate that low hazard occupancies include apartments, dwellings, dormitories, hotels, and schools, and as such, a low hazard occupancy / limited combustible building contents credit was applied. A two-hour fire separation will be required on the southern side of each building to minimize fire flow requirements for the site. Additionally, a sprinkler system designed to conform to NFPA 13 will be required for building B, and is to be designed by others. Based on calculations per the FUS Guidelines (**Appendix A.2**), the minimum required fire flows for this development are 67 L/s (4,000 L/min).

3.3 PROPOSED SERVICING

Per the boundary conditions provided by the City of Ottawa and based on an approximate elevation on-site of 62.4m, adequate flows are available for the subject site with pressures ranging from 43.0m (61 psi) to 79.2m (69 psi). This pressure range is within the guidelines of 50-80 psi based on Ottawa's Design Guidelines for Water Distribution. A pressure check at the time of

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Water Supply Servicing
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construction is recommended to determine if pressure control valves (>80 psi) are required for the subject site.

Using boundary conditions for the proposed development under maximum day demands and a fire flow requirement of 4,000L/min (67L/s) per the FUS methodology, it can be confirmed that the system will maintain a residual pressure of approximately the required 140 kPa (20 psi). The above demonstrates that the existing watermain within Rideau Place can provide adequate fire and domestic flows in excess of flow requirements for the subject site. An existing hydrant is located approximately 14m south of the subject site along Fountain Place and is within 90m per City of Ottawa standards.

3.4 SUMMARY OF FINDINGS

The proposed development is located in an area of the City's water distribution system that has sufficient capacity to provide both the required domestic and emergency fire flows. Based on boundary conditions as provided by City of Ottawa staff, fire flows are available for this development based on FUS guidelines and as per the City of Ottawa water distribution guidelines.

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Wastewater Servicing
October 14, 2016

4.0 WASTEWATER SERVICING

4.1 BACKGROUND

The site will be serviced via an existing 300mm diameter combined sewer situated within the Fountain Place ROW at the eastern boundary of the site (see **Drawing SP-1**). It is proposed to make one 150mm diameter connection directly to the existing main to service the proposed site.

4.2 DESIGN CRITERIA

As outlined in the City of Ottawa Sewer Design Guidelines and the MOE's Design Guidelines for Sewage Works, the following criteria were used to calculate estimated wastewater flow rates and to size the sanitary sewers:

- Minimum Velocity – 0.6 m/s (0.8 m/s for upstream sections)
- Maximum Velocity – 3.0 m/s
- Manning roughness coefficient for all smooth wall pipes – 0.013
- Average Wastewater Generation – 350L/cap/day
- Peak Factor – 4.0 (Harmon's)
- Extraneous Flow Allowance – 0.28 l/s/ha (conservative value)
- Manhole Spacing – 120 m
- Minimum Cover – 2.5m
- Unit Density for Average Apartments – 1.8 pers./unit

4.3 PROPOSED SERVICING

The proposed site will be serviced by a private network of gravity sewers which will direct the wastewater flows (approx. 0.66 L/s with allowance for infiltration) to the existing 300mm diameter combined sewer. The proposed drainage pattern is detailed on **Drawing SP-1**. A Sanitary sewer design sheet for the proposed service lateral is included in **Appendix B.1**. Full port backwater valves are to be installed on all sanitary services within the site to prevent any surcharge from the downstream combined sewer from impacting the proposed property.

5.0 STORMWATER MANAGEMENT

5.1 OBJECTIVES

The objective of this stormwater management plan is to determine the measures necessary to control the quantity/quality of stormwater released from the proposed development to criteria established during the pre-consultation/zoning process, and to provide sufficient detail for approval and construction.

5.2 SWM CRITERIA AND CONSTRAINTS

Criteria were established by combining current design practices outlined by the City of Ottawa Design Guidelines (2012), and through consultation with City of Ottawa and Rideau Valley Conservation Authority (RVCA) staff. The following summarizes the criteria, with the source of each criterion indicated in brackets:

General

- Use of the dual drainage principle (City of Ottawa).
- Wherever feasible and practical, site-level measures should be used to reduce and control the volume and rate of runoff, including the use of permeable pavers on all paved access areas on-site. (City of Ottawa, RVCA)
- The proposed site is not subject to quantity/quality control criteria due to proximity to the discharge point within the Rideau River and site-level BMPs (permeable pavers) (City of Ottawa, RVCA).

Storm Sewer

- Size storm sewers (if required) to convey 5 year storm event under free-flow conditions using City of Ottawa I-D-F parameters (City of Ottawa).
- Demonstrate sufficient capacity within downstream storm sewers for increase in flows from site development (City of Ottawa).

Surface Storage & Overland Flow

- Building openings to be a minimum of 0.30m above the 100-year water level (City of Ottawa)
- Provide adequate emergency overflow conveyance off-site (City of Ottawa)

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Stormwater Management
October 14, 2016

5.3 PROPOSED SERVICING

The proposed site will be serviced by existing gravity sewers within the Fountain Place ROW which direct flows to an existing 6000mm diameter outfall to the Rideau River immediately east of the subject site. Site drainage and rooftop discharge is to be directed on the surface to the existing Fountain Place ROW for capture within an existing double catchbasin located approximately 21m south of the site. Proposed hard surface areas on-site are to be constructed with permeable pavers to minimize site runoff potential to the downstream sewer system. Building roof scuppers and leaders are to discharge to permeable surfaces to promote infiltration and further reduce peak discharge to the sewer system.

Based on the proposed site plan for the property, approximately 86% of the 0.07ha site is proposed to be impervious in nature, which corresponds to a runoff coefficient for the proposed site of 0.80. Using the minimum time of concentration for the site of 10 minutes and 100 year storm intensity of 178.56 mm/hr, peak discharge from the proposed site during the 100-year event is estimated at 27.8L/s.

The Rational Method was employed to assess the capacity of downstream sewers based on the estimated rate of runoff generated during post-development conditions. Existing subcatchments for external areas were estimated based on available topographical mapping and as-builts supplied by the City of Ottawa. Areas of the Cummings Bridge tributary to the downstream storm sewer were considered to have been designed to meet a 10-year free flowing design criteria. Results of the storm sewer design sheet indicate that downstream sewers continue to be free flowing during post-development conditions for the design storm event (see **Appendix C** and **Drawing SD-1**). It is of note that inverts of the downstream sewer system were not available at time of design to confirm sewer slopes to the outfall location. As such, existing sewers were conservatively assumed to be at minimum slope per City of Ottawa Sewer Design Guidelines.

6.0 GRADING AND DRAINAGE

The proposed development site measures approximately 0.07 ha in area. The topography across the site is sloped steeply, and currently drains from west to east, with overland flow generally being directed to the adjacent Fountain Place ROW. The grades at property corners vary by as much as 8m across the site. A detailed grading plan (see **Drawing GP-1**) has been provided to satisfy the stormwater management requirements, adhere to permissible grade raise restrictions (see **Section 10.0**) for the site, and provide for minimum cover requirements for sanitary sewers where possible. A series of retaining walls have been proposed to account for the grade changes across the property. Site grading has been established to provide emergency overland flow routes required for stormwater management in accordance with City of Ottawa requirements.

The subject site maintains emergency overland flow routes for flows deriving from storm events in excess of the maximum design event to the existing Fountain Place ROW and ultimately to the Rideau River as depicted in **Drawing GP-1**.

7.0 UTILITIES

As the subject site lies within a mature developed residential community, Hydro, Bell, Gas and Cable servicing for the proposed development should be readily available within the adjacent rights-of-way. It is anticipated that existing infrastructure will be sufficient to provide a means of distribution for the proposed site. Exact size, location, and routing of utilities, along with determination of any off-site works required for redevelopment, will be finalized after design circulation.

8.0 APPROVALS

Pre-consultation with Ontario Ministry of Environment (MOECC) staff concerning Environmental Compliance Approvals (ECAs, formerly Certificates of Approval (CofA)) under the Ontario Water Resources Act is forthcoming. It is expected that an ECA will not be required for approval of the proposed building service connections, as stormwater will not discharge to the existing combined sewer within Fountain Place. The Rideau Valley Conservation Authority will need to be consulted in order to obtain municipal approval for site development, as well as to obtain a permit for site alteration subject to Ontario Regulation 174/06.

Requirement for a MOE Permit to Take Water (PTTW) is unlikely for the site as the majority of proposed works are above the groundwater elevations shown in the geotechnical report. The geotechnical consultant shall confirm at the time of application that a PTTW is not required.

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Erosion Control During Construction
October 14, 2016

9.0 EROSION CONTROL DURING CONSTRUCTION

Erosion and sediment controls must be in place during construction. The following recommendations to the contractor will be included in contract documents.

1. Implement best management practices to provide appropriate protection of the existing and proposed drainage system and the receiving water course(s).
2. Limit extent of exposed soils at any given time.
3. Re-vegetate exposed areas as soon as possible.
4. Minimize the area to be cleared and grubbed.
5. Protect exposed slopes with plastic or synthetic mulches.
6. Provide sediment traps and basins during dewatering.
7. Install sediment traps (such as SiltSack® by Terrafix) between catch basins and frames.
8. Plan construction at proper time to avoid flooding.

The contractor will, at every rainfall, complete inspections and guarantee proper performance. The inspection is to include:

9. Verification that water is not flowing under silt barriers.
10. Clean and change silt traps at catch basins.

Refer to **Drawing EC-1** for the proposed location of silt fences, straw bales and other erosion control structures.

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Geotechnical Investigation and Environmental Assessment
October 14, 2016

10.0 GEOTECHNICAL INVESTIGATION AND ENVIRONMENTAL ASSESSMENT

A geotechnical Investigation Report was prepared by Paterson Group on April 24, 2016. The report summarizes the existing soil conditions within the subject area and construction recommendations. For details which are not summarized below, please see the original Paterson report.

A subsurface investigation was conducted and concluded that the site is underlain by topsoil, rootlets and gravel overlaid by stiff to very stiff silty clay. Bedrock is anticipated to lie within 15m to 25m below ground surface. Groundwater elevations in the area are anticipated to occur between 4m and 5m below ground surface, and was not encountered during field observations. Grade raise fill restrictions across the site have been established at 0.8m. The grade raise restrictions were accounted for in the grading design of the property. Refer to Report #PG3780-LET.01 for additional Geotechnical information.

The required pavement structure for proposed hard surfaced areas are outlined in **Tables 1 and 2** below:

Table 1: Pavement Structure – Car Only Parking Areas

| Thickness (mm) | Material Description |
|----------------|--|
| 50 | Wear Course – HL-3 or Superpave 12.5 Asphaltic Concrete |
| 150 | Base – OPSS Granular A Crushed Stone |
| 300 | Subbase - OPSS Granular B Type II |
| - | Subgrade – Either fill, in situ soil, or OPSS Granular B Type I or II material placed over in situ soil or fill. |

Table 2: Pavement Structure – Access Lanes

| Thickness (mm) | Material Description |
|----------------|--|
| 40 | Wear Course – HL-3 or Superpave 12.5 Asphaltic Concrete |
| 50 | Binder Course – HL-8 or Superpave 19.0 Asphaltic Concrete |
| 150 | Base – OPSS Granular A Crushed Stone |
| 400 | Subbase - OPSS Granular B Type II |
| - | Subgrade – Either fill, in situ soil, or OPSS Granular B Type I or II material placed over in situ soil or fill. |

11.0 CONCLUSIONS

11.1 WATER SERVICING

Based on the supplied boundary conditions for existing watermain and estimated domestic and fire flow demands for the subject site, it is anticipated that the proposed servicing in this development will provide sufficient capacity to sustain both the required domestic demands and emergency fire flow demands of the proposed site. Fire flows greater than those required per the FUS Guidelines are available for this development.

11.2 SANITARY SERVICING

The proposed sanitary sewer network is sufficiently sized to provide gravity drainage of the site. The proposed site will be serviced by a gravity sewer service lateral which will direct wastewater flows (approx. 0.66 L/s) to the existing 300mm dia. combined sewer within the Rideau Place ROW at the northern boundary of the property. The proposed drainage outlet has sufficient capacity to receive sanitary discharge from the site based on pre-consultation through City of Ottawa staff.

11.3 STORMWATER SERVICING

The proposed stormwater management plan is in compliance with the goals specified through consultation with the City of Ottawa. Permeable pavers will be employed to reduce peak discharge from the subject site. No quantity or quality concerns were identified during pre-consultation with City/RVCA staff. The downstream receiving sewer has sufficient capacity to receive runoff volumes from the site based on existing as-built/topographical information.

11.4 GRADING

Grading for the site has been designed to provide an emergency overland flow route as per City requirements and reflects the grade raise restrictions recommended in the Geotechnical Investigation Report prepared by Paterson Group on April 24, 2016. Erosion and sediment control measures will be implemented during construction to minimize the impact to existing watercourses.

11.5 UTILITIES

Utility infrastructure exists within overhead lines within the adjacent rights-of-way at the eastern boundary of the proposed site. It is anticipated that existing infrastructure will be sufficient to provide a means of distribution for the proposed site. Exact size, location and routing of utilities will be finalized after design circulation.

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Conclusions
October 14, 2016

11.6 APPROVALS/PERMITS

An MOE Environmental Compliance Approval is not expected to be required for the subject site. A forthcoming pre-consultation meeting with the MOE will confirm the above statement. A Permit to Take Water is not anticipated to be required for pumping requirements for service lateral installation. The Rideau Valley Conservation Authority will need to be consulted in order to obtain municipal approval for site development and permitting under Ontario Regulation 174/06. No other approval requirements from other regulatory agencies are anticipated.