455 McArthur Avenue – Servicing Report

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Prepared for:

Rideau Glen Developments

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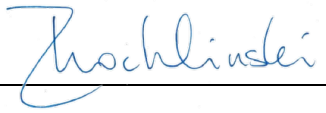
Prepared by 

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1.0 INTRODUCTION

Stantec Consulting Ltd. has been commissioned by Rideau Glen Developments to prepare a servicing study in support of the site plan approval application for the proposed development located at 455 McArthur Avenue. The 0.052 ha site is located about 135 metres west of the McArthur Avenue and St Laurent Boulevard intersection in the Vanier neighbourhood of Ottawa. The proposed infill development would replace an existing two-storey, multi-unit residential property and standalone four-car garage with a three-storey, 12-unit residential building. A key plan showing the location of the site is included below in **Figure 1**.

Figure 1: Key plan of site

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 uses the existing local infrastructure in accordance with any limitations communicated during consultation with City of Ottawa staff.

The report and servicing drawings have been revised to respond to the City's first submission comments.

2.0 BACKGROUND

Documents referenced in preparation of the design for the 455 McArthur Avenue development include:

- Geotechnical Investigation – Report PG5177-1, prepared on January 8, 2020 by Paterson Group.
- Phase I Environmental Site Assessment – Report PE4808-1, prepared on January 10, 2020 by Paterson Group.
- Phase II Environmental Site Assessment – Report PE4808-2, prepared on January 13, 2020 by Paterson Group.
- City of Ottawa Sewer Design Guidelines (SDG), City of Ottawa, October 2012, including all subsequent technical bulletins.
- City of Ottawa Design Guidelines – Water Distribution, City of Ottawa, July 2010, including all subsequent technical bulletins.

3.0 WATER SERVICING

3.1 BACKGROUND

The proposed development consists of a three-storey residential building containing six one-bedroom units and six two-bedroom units. The property is located within Pressure Zone 1E. The existing ground elevation at the site is approximately 71.3 m. Under normal operating conditions, the hydraulic grade line at the proposed site ranges from approximately 109.8 m to 118.2 m, as confirmed by the boundary conditions provided by the City of Ottawa (refer to **Appendix A.3**).

3.2 WATER DEMANDS

Water demands for the development were estimated using the City of Ottawa Design Guidelines – Water Distribution (2010). A daily demand rate of 350 L/cap/day was applied for the population of the proposed site. Per unit populations were taken from Table 4.1 of the Design Guidelines. See **Appendix A.1** for detailed domestic water demand calculations.

Using the peaking factors provided in the City of Ottawa Design Guidelines, the average day demand (AVDY) for the site was determined to be 0.09 L/s, the maximum day demand rate (MXDY) is 0.22 L/s, and the peak hour demand rate (PKHR) is 0.49 L/s.

The Office of the Fire Marshal (OFM) guidelines were used to address building code requirements to provide adequate fire protection for the proposed site. The OFM guidelines were used since the site does not contain a private watermain nor a fire hydrant, but instead relies on existing municipal watermains. Per the OFM guidelines, the building's construction type is combustible without fire-resistance ratings and, as a residential apartment building, it is classified under Group C. Based on calculations per the OFM Guidelines (included in **Appendix A.2**), the minimum required fire flow for this development is 60 L/s (3,600 L/min).

3.3 PROPOSED SERVICING

The site will be serviced from the existing 406 mm diameter ductile iron watermain on McArthur Avenue via a proposed 50 mm diameter copper service. The mechanical consultant has confirmed that the water service for the proposed development is required to have a diameter of at least 50 mm.

Based on boundary conditions provided by the City of Ottawa and an approximate ground elevation of 70.3 metres, adequate domestic water supply is available for the subject site with residual pressures ranging from 56.2 psi to 68.1 psi. This pressure range falls within the acceptable range of 40 to 80 psi specified in the City of Ottawa Design Guidelines for Water Distribution.

The boundary conditions for the proposed development under maximum day demands and a fire flow demand of 3,600 L/min calculated using the OFM methodology, the residual pressure at the site at ground

level is 59.3 psi (given a hydraulic grade line elevation of 112.0 m). This pressure is in excess of the required minimum pressure of 140 kPa (20 psi) during maximum day + fire flow conditions.

In summary, the existing 406 mm diameter watermain on McArthur Avenue can provide adequate fire and domestic flows for the subject site based on City of Ottawa Design Guidelines. An existing hydrant, located approximately 5 m east of the subject site, can be used for fire suppression. The proposed water servicing is shown on **Drawing SSP-1** contained in **Appendix F**.

4.0 WASTEWATER SERVICING

The site will be serviced from the existing 225 mm diameter concrete sanitary sewer on McArthur Avenue. A 150 mm diameter sanitary service lateral connected directly to the 225 mm diameter main will service the building from its south side. See Drawing SSP-1 (in **Appendix F**) for the proposed location of the service lateral.

4.1 DESIGN CRITERIA

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

- 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
- Minimum size of sanitary sewer service = 135 mm
- Minimum grade of sanitary sewer service = 1.0% (2.0% preferred)
- Average wastewater generation = 280 L/person/day
- Peak Factor = based on Harmon Equation; maximum of 4.0 (residential)
- Harmon correction factor = 0.8
- Infiltration allowance = 0.33 L/s/ha (per City Design Guidelines)
- Minimum cover for sewer service connections – 2.0 m
- Population density for one-bedroom apartments – 1.4 persons/apartment
- Population density for two-bedroom apartments – 2.1 persons/apartment

4.2 PROPOSED SERVICING

The proposed site will be serviced by a 150 mm diameter service lateral, flowing by gravity, connected to the 225 mm diameter sanitary main on McArthur Avenue. Refer to **Appendix B.1** for the sanitary service lateral design sheet. As the sub-basement is at a lower elevation than the sanitary sewer on McArthur Avenue, the service lateral will not pass under the footing of the building. The sanitary service lateral will need to pass through the foundation wall and connections at the basement level will need to be pumped. The pumping system is to be designed by the building's mechanical engineer. A full port backwater valve is to be installed on the sanitary service lateral to prevent flooding in the event that the sanitary sewer on McArthur Avenue surcharges.

5.0 STORMWATER MANAGEMENT AND SERVICING

5.1 OBJECTIVES

The goal of this stormwater servicing and stormwater management (SWM) plan is to determine the measures necessary to control the quantity and quality of stormwater released from the proposed development to meet the criteria established during the consultation process with City of Ottawa staff, and to provide sufficient details required for approval and construction.

5.2 SWM CRITERIA AND CONSTRAINTS

SWM criteria were established using the City of Ottawa Sewer Design Guidelines (SDG) and through consultation with City of Ottawa staff. The following summarizes the list of criteria applicable to the stormwater servicing design of the site, with the source of each criterion indicated in parentheses:

General

- Use the dual drainage principle (SDG).
- Wherever feasible and practical, site-level measures should be used to reduce and control the volume and rate of runoff (SDG).

Storm Sewer & Inlet Controls

- Maximum discharge rates for the site under all storm events are to be restricted to the maximum runoff resulting from a 5-year storm event with a runoff coefficient of C = 0.5 (City staff).
- Stormwater discharge from the site will be directed to the existing 375 mm dia. reinforced concrete storm sewer on McArthur Avenue (City staff).
- The stormwater system in the area is uncontrolled, meaning the system may surcharge during critical events. The internal stormwater system must be designed with this in mind (City staff).
- The site does not have quality control requirements, but best management practices should be applied throughout (Jamie Batchelor, RVCA).

Surface Storage & Overland Flow

- A 15 cm vertical clearance is necessary between the spill elevation and the ground elevation at the building envelope that is in proximity of the flow route or ponding area (City staff).
- Maximum depth of flow under either static or dynamic conditions shall be less than 0.30 m (SDG).
- Provide adequate emergency overflow conveyance off-site (SDG).

5.3 FOUNDATION DRAIN AND SUNKEN PATIO DRAINS

The foundation and sunken patio drains for the building are to be serviced by a 150 mm diameter service lateral connection to the 375 mm diameter storm sewer on McArthur Avenue. A pump system will be required to bring the water from the foundation to the elevation of the service lateral as the footing is below the elevation of the storm sewer on McArthur Avenue. The pumping system and internal plumping is to be designed by the building's mechanical engineer. The drains required for the sunken patios are expected to drain to the stormwater service by gravity, and will be separated from the foundation drain. The detailed design of the patio drains is to be provided by the building's mechanical engineer.

A full port backwater valve is to be installed on this service lateral to prevent flooding in the event that the storm sewer on McArthur Avenue, which is not controlled, surcharges. Refer to **Drawing SSP-1** in **Appendix F** for the proposed location of the service lateral.

5.4 STORMWATER MANAGEMENT

5.4.1 Allowable Release Rate

Based on consultation with City of Ottawa staff, the peak post-development discharge from the subject site is to be limited to the discharge resulting from the 5-year event using a site runoff coefficient of C = 0.5. The predevelopment release rate for the area has been determined using the rational method based on the criteria above. A time of concentration for the predevelopment area (10 minutes) was assigned based on the small site size and its proximity to the existing drainage outlet. C coefficient values have been increased by 25% for the post-development 100-year storm event based on MTO Drainage Manual recommendations. Peak flow rates have been calculated using the rational method as follows:

$$Q = 2.78\,(C)(I)(A)$$

Where:

$Q = peak\ flow\ rate, L/s$

$C = site\ runoff\ coefficient$

$I = rainfall\ intensity, mm/hr\ (per\ City\ of\ Ottawa\ IDF\ curves)$

$A = drainage\ area, ha$

$$Intensity\ (mm/hr) = \frac{998.071}{(10 + 6.053)^{0.814}} = 104.19\ mm/hr$$

$$Q = 2.78(0.5)(104.19 mm/hr)(0.052\ ha) = 7.48 L/s$$

5.4.2 Storage Requirements

The site requires quantity control measures to meet the restrictive stormwater release criteria. It is proposed that rooftop storage via restricted roof release in combination with pipe storage and sewers equipped with inlet control devices (ICDs) be used to reduce site peak outflow to meet target rates. A spreadsheet using the Modified Rational Method (MRM) was used to initially size the subsurface storage.

A dynamic model in PCSWMM was then used to confirm the sizing of the subsurface storage tank, in accordance with comments made by the City in the pre-consultation.

5.4.2.1 Rooftop Storage

It is proposed to retain stormwater on the building rooftops by installing restricted flow roof drains. The following calculations assume the roof will be equipped with two standard Watts Model R1100 Accuflow Roof Drains.

Watts Drainage *Accutrol* roof drain weir data has been used to calculate a practical roof release rate and detention storage volume for the rooftops. It should be noted that the *Accutrol* weir has been used as an example only, and that other products may be specified for use, provided that the peak roof drain release rate is restricted to match the maximum rate of release indicated in **Table 5-1**, and that sufficient roof storage is provided to meet (or exceed) the resulting volume of detained stormwater. Proposed drain release rates have been calculated based on the *Accutrol* weir setting at 25% open. Storage volume and controlled release rate are summarized in **Table 5-1**:

Table 5-1: Roof Control Area (ROOF)

Design Storm	Storage Depth (mm)	Discharge (L/s)	Volume Stored (m^3)
5-year	101.0	1.58	3.11
100-Year	135.8	1.80	7.67

5.4.2.2 Uncontrolled Areas

Due to grading restrictions, two small subcatchments on the south and east ends of the site have been designed without a storage component. These subcatchment areas direct their uncontrolled discharge off-site to the adjacent McArthur Avenue. Peak discharges from uncontrolled areas have been considered in the overall SWM plan and have been balanced through overcontrolling the discharge rates for the other subcatchment areas to meet target levels.

Table 5-2: Uncontrolled Non-Tributary Area (UNC-1 through UNC-2)

Design Storm	Discharge (L/s)
5-year	1.11
100-Year	2.39

5.4.2.3 Subsurface Storage

Per the modified rational method calculations included in **Appendix C.2**, the remainder of the site, including roof discharge, is to be directed towards a storage pipe to be located along the eastern side of the building. The storage pipe will connect to a catch basin (CB-1) on its upstream end and a catch basin maintenance hole (CBMH-1) on its downstream end. The downstream catch basin maintenance hole will have an IPEX Tempest LMF model 85 (Vortex ICD) inlet control device installed on its outlet to meet the target peak discharge rate for the 100-year event. In order to control peak discharge from the subject site to within target levels, the storage pipe has been sized to provide a volume of approximately 5.09 $m^{3.}$ The

storage pipe and the downstream catch basin maintenance hole provide a total of 5.61 m^3 of subsurface storage volume.

Table 5-3 summarizes the storage volume and controlled release rate for the site during the 100-year storm based on the Modified Rational Method (MRM). Design sheets are included in **Appendix C**.

Table 5-3: 100 Year Storage Requirements and Release Rates based on MRM

Areas Tributary to Proposed Tank with Controlled Release Rate	100 Year Subsurface Volume Requirements (m^3)	100 Year Release Rate (L/s)
STRM-1, ROOF	5.28	4.36
UNC-1 through UNC-2	-	2.46

5.4.3 PCSWMM Analysis

A PCSWMM model was created to confirm the peak outflow and storage values from the MRM analysis, in accordance with the guidance provided by the City. Both the 3-hour, 100-year Chicago storm and 12-hour, 100-year SCS storm (MTO distribution) were used to analyze the SWM system proposed for the site. The 100-year Chicago storm was found to produce slightly greater outflows than the SCS event. The model produced a slightly larger maximum outflow (5.08 L/s) during the 100-year Chicago event than was produced by the MRM sheet (4.36 L/s) in the 100-year event. The PCSWMM analysis confirms that the 525 mm diameter storage pipe provides adequate storage to retain the 100-year event while meeting the target release rate. The results of the PCSWMM analysis for both the SCS and Chicago storms are included in **Appendix C.3**.

5.4.4 Results

Table 5-4 provides a summary of the peak design discharge rates from the MRM and PCSWMM analysis based on the proposed stormwater management plan. As the table demonstrates, the site's SWM design adheres to the target peak outflow rate in both the MRM and PCSWMM analysis.

Table 5-4: Summary of Total 5-Year and 100-Year Event Release Rates

	5-year Peak Discharge (L/s) using MRM	100-Year Peak Discharge (L/s) using MRM	100-Year Peak Discharge (L/s) using PCSWMM
Uncontrolled – Surface	1.11	2.39	2.39**
Controlled – Subsurface Storage (includes flow from roof drain)*	2.84	4.36	5.08
Total (L/s)	**3.96**	**6.75**	**7.47**
Target (L/s)	**7.48**	**7.48**	**7.48**

*Flows from the roof are directed to the subsurface storage tank.

**Uncontrolled surface flows from the MRM analysis

Flows from the subsurface storage tank and flow captured by CBMH-1 will be directed to the 375 mm diameter storm sewer on McArthur Avenue using a 200 mm diameter lead. A design sheet confirming the adequacy of the size of the lead is included in **Appendix C.1**. See Drawing SSP-1 (in **Appendix F**) for the proposed locations of all services and other SWM infrastructure.

6.0 SITE GRADING AND DRAINAGE

The proposed development site measures approximately 0.052 ha in area. The site is relatively flat, and currently drains towards all adjacent properties, with overland flow generally being directed to the adjacent McArthur Avenue right-of-way to the south. A detailed grading plan (see **Appendix F**) has been provided to satisfy stormwater management requirements, adhere to any geotechnical restrictions (see **Section 10.0**) for the site, and provide the minimum required cover for storm and sanitary sewers where possible. Site grading has been established to provide emergency overland flow routes required for stormwater management in accordance with City requirements.

The subject site is graded to provide an emergency overland flow route to the south of the site onto McArthur Avenue. A curb wall on the western and northern edges of the site, as well as a barrier curb along the eastern perimeter, prevent stormwater from running off into the adjacent properties and allow for sufficient overland slopes to CB-1. As the stormwater storage tank is sized to hold the 100-year storm event, the emergency overland flow route will only be triggered during storm events with a greater-than-100-year return period.

7.0 UTILITIES

Overhead wires run east-west on the north side of McArthur Avenue and along the eastern perimeter of the site. These wires will restrict the movement of heavy machinery during the construction works but otherwise, should not cause any conflicts with the proposed services and site works. The existing utility poles are to be protected during construction.

Hydro, gas, and cable servicing should be readily available for the development, as the site lies within a mature, residential area and the existing building on the site is presumed to be currently serviced by all of these utilities. The exact size, location, and routing of utilities, including determining whether off-site works are required to extend any additional utility services to the property, shall be finalized after design circulation.

8.0 APPROVALS/RESTRICTIONS

The proposed development lies on a private site under singular ownership draining to an approved sewer outlet, does not drain to a combined sewer, and is not intended to service industrial land or land uses. Therefore, the site is exempt from the Ministry of the Environment, Conservation and Parks (MECP) Environmental Compliance Application (ECA) process under O.Reg. 525/98).

As is mentioned in the geotechnical report for the site, for typical ground or surface water volumes being pumped during the construction phase, typically between 50,000 to 400,000 L/day, it is required to register on the Environmental Activity and Sector Registry (EASR). A minimum of two to four weeks should be allotted for completion of the EASR registration and the preparation of the Water Taking and Discharge Plan by a Qualified Person as stipulated under O.Reg. 63/16. A Permit to Take Water (PTTW) through the MECP would be required for dewatering in excess of 400,000 L/day, which is unlikely for this site. However, if a PTTW is required, at least 4 to 5 months should be allowed for completion of the application and issuance of the permit by the MECP.

As is discussed in **Section 10.0**, the Phase II Environmental Site Assessment noted the presence of petroleum hydrocarbons in the northeast corner of the site. The associated report recommends that fill in this area be removed under the supervision of Paterson staff and disposed of at an approved facility.

Please refer to the geotechnical report, included in **Appendix D**, for further discussion regarding potential construction limitations due to the site conditions.

Because the site is within 100 m of St Laurent Boulevard and McArthur Avenue, an environmental noise study will be required. A stationary noise study, per City NCG and NPC 300 Guidelines, will also be needed for the site, based on the pre-consultation meeting with the City. These studies are to be undertaken by other consultants and to be submitted as part of the site plan application.

9.0 EROSION CONTROL DURING CONSTRUCTION

In order to protect downstream water quality and prevent sediment build up in catch basins and storm sewers, erosion and sediment control measures must be implemented during construction. The following recommendations will be included in the contract documents and communicated to the Contractor.

1. Implement best management practices to provide appropriate protection of the existing and proposed drainage system and the receiving water course(s).
2. Limit the extent of the 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 geotextiles, geogrid, or synthetic mulches.
6. Provide sediment traps and basins during dewatering works.
7. Install sediment traps (such as SiltSack® by Terrafix) between catch basins and frames.
8. Schedule the construction works at times which avoid flooding due to seasonal rains.

The Contractor will also be required to complete inspections and guarantee the proper performance of their erosion and sediment control measures at least after every rainfall. The inspections are to include:

- Verification that water is not flowing under silt barriers.
- Cleaning and changing the sediment traps placed on catch basins.

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

10.0 GEOTECHNICAL INVESTIGATION AND ENVIRONMENTAL SITE ASSESSMENTS

A geotechnical investigation report was prepared by Paterson Group on January 8, 2020 regarding conditions within the subject area and construction recommendations. For details which are not summarized below, please see the report in its entirety in **Appendix D**.

Subsurface soil conditions within the subject area were determined from three (3) boreholes advanced within the proposed site. The subsurface profile consisted of pavement underlain by 1.1 to 2.7 m of fill. The fill consisted of brown silty sand with trace silty clay as well as some gravel and crushed stone. A glacial till deposit, consisting of a loose to compact brown sandy silt to silty clay with fragments of weather bedrock, underlies the fill. Bedrock was encountered at depths of 1.8 to 3.1 m below the existing ground surface (geodetic elevations between 68.15 m and 69.55 m). The bedrock consists of severely weathered shale of the Billings formation and can be classified as being of very poor quality based on the Rock Quality Designation values.

Groundwater levels, measured on December 11, 2019 at each of the three boreholes, were found to range between 67.28 m and 68.93 m. According to the geotechnical investigation, groundwater levels can be expected approximately 3 to 4 m below the ground surface (i.e. at elevations of approximately 67.3 m to 68.3 m); however, these levels are subject to seasonal fluctuations.

Removal of the weathered bedrock will be required to install the proposed building foundation. The investigation found that the in-situ bedrock was generally suitable to support the proposed building using conventional shallow footings. Due to its very poor quality, the rock can likely be removed by hoe-ramming and using conventional excavation methods. The weathered shale bedrock is potentially expansive. Therefore, the geotechnical investigation report recommends placing a 50 mm thick mud mat, consisting of 15 MPa lean concrete, over the entire surface of the rock within 48 hours of its exposure.

The pavement structure for the car only parking areas and the access lanes are provided in the following two tables.

Table 10-1: Pavement Structure for Car Only Parking Areas

Thickness (mm)	Material Description
50	Superpave 12.5 (PG 58-34) Asphaltic Concrete
150	OPSS Granular 'A' Base
300	OPSS Granular 'B' Type II Subbase
Varies	Subgrade: either fill, in situ soil, or OPSS Granular B Type I or II material placed over in situ soil or fill

Table 10-2: Pavement Structure for Access Lanes

Thickness (mm)	Material Description
40	Superpave 12.5 (PG 58-34) Asphaltic Concrete
50	Superpave 19.0 (PG 58-34) Asphaltic Concrete
150	OPSS Granular 'A' Base
450	OPSS Granular 'B' Type II Subbase
Varies	Subgrade: either fill, in situ soil, or OPSS Granular B Type I or II material placed over in situ soil or fill

A Phase I and Phase II Environmental Site Assessment (ESA) were completed for the site by Paterson Group. The Phase II ESA, attached in **Appendix E**, found that the soil in the northeast corner of the property contains marginal PHC (petroleum hydrocarbon) impacts from the adjacent garage on 457 McArthur Avenue. The report recommends that the impacted fill material be removed from the site during the development process, with the excavation to be monitored and confirmed by Paterson. The impacted soil is to be disposed of at an approved waste disposal facility.

If the monitoring wells are not to be used in the future, they should be abandoned as part of the site development works in accordance with Ontario Regulation 903.

Recommendations are provided for the drainage of the footings and building slab. These components will form part of the building design. A separate outlet for the foundation drain has been provided as part of the site servicing design as shown on drawing SSP-1 (attached in **Appendix F**).

11.0 CONCLUSIONS

11.1 WATER SERVICING

Based on the supplied boundary conditions for existing watermains and calculated domestic and fire flow demands for the subject site, this adjacent watermain on McArthur Avenue has sufficient capacity to sustain both the required domestic demands and emergency fire flow demands. The proposed development requires a 50 mm diameter water service which will be connected to the existing main on McArthur Avenue.

11.2 SANITARY SERVICING

The proposed sanitary sewer service is sufficiently sized to provide gravity drainage of the site. The proposed development will be serviced by a 150 mm dia. sanitary service lateral directing wastewater by gravity to the existing 225 mm diameter sanitary sewer on McArthur Avenue. A full port backwater valve on the sanitary service lateral will prevent flooding in the event that the sanitary sewer on McArthur Avenue, which is only partially separated, surcharges. The proposed outlet has sufficient capacity to receive sanitary discharge from the site.

11.3 STORMWATER SERVICING AND MANAGEMENT

A 150 mm diameter storm service is proposed for the building's foundation drain and to drain the sunken patios on the southern face of the building. A full port backwater valve on the stormwater service will prevent flooding in the event that the storm sewer on McArthur Avenue surcharges. The water captured by the foundation drain will need to be pumped to the storm service as the building's footing is at a lower elevation than the storm sewers on McArthur Avenue. The drains for the sunken patios (to be designed by the mechanical engineer) are expected to drain to the storm service by gravity, and will be separated from the foundation drain.

The remainder of the site will drain to the main on McArthur Avenue using a separate 200 mm diameter service lateral and be bound by a stormwater management plan in compliance with the goals specified through pre-consultation with the City of Ottawa. On-site surface storage, roof storage, an underground storage pipe, and ICDs have been proposed to limit the peak 100-year stormwater discharge rate for the development area to 6.75 L/s. This discharge rate is less than 7.48 L/s, the maximum allowable discharge rate for the site, as determined by the City of Ottawa's stormwater management criteria for the site. The City has not expressed any concerns regarding the receiving sewer's capacity to receive runoff volumes from the site. The underground storage pipe will store up to and including the 100-year rainfall event, with emergency overland flow only being used for events with a return period greater than 100 years.

11.4 GRADING

Site grading has been designed so as to provide an emergency overland flow route as per City requirements and to follow the recommendations made in the geotechnical investigation report prepared

by Paterson Group. Erosion and sediment control measures, outlined in this report and included in the drawing set, will be implemented during construction to reduce the impact on existing facilities.

11.5 UTIILITIES

Utility infrastructure exists within the adjacent McArthur Avenue ROW to the south of the site and on the eastern perimeter of the site. It is anticipated that the existing infrastructure will be sufficient to provide service for the entire proposed development. Overhead wires throughout the site will need to be supported and possibly relocated during construction. The exact size, location, and routing of utilities will be finalized after design circulation.

11.6 APPROVALS/RESTRICTIONS

An MECP Environmental Compliance Approval (ECA) is not required for the site, as the development lies on a private site under singular ownership draining to an approved sewer outlet, does not drain to a combined sewer, and is not intended to service industrial land or land uses. Therefore, the site is exempt from the Ministry of the Environment, Conservation and Parks (MECP) Environmental Compliance Application (ECA) process under O.Reg. 525/98).

For the expected dewatering needs of 50,000 to 400,000 L/day, the proponent will need to register on the MECP's Environmental Activity and Sector Registry (EASR). A Permit to Take Water will only be required for dewatering needs in excess of 400,000 L/day which is not expected for this site. The Phase II ESA recommends the removal and disposal of some soils in the northeast corner of the site which are contaminated with petroleum hydrocarbons. No permitting is expected for this activity, which is recommended to be conducted under the supervision of a geotechnical consultant. An environmental noise study and stationary noise study per City NCG and NPC 300 Guidelines will be required as the site is within 100 m of St Laurent Boulevard. These studies are to be undertaken by other consultants and to be submitted as part of the site plan application.