

FUNCTIONAL SERVICING REPORT REDEVELOPMENT OF 550 KERR STREET OAKVILLE, ONTARIO

PREPARED FOR:

ROCK DEVELOPMENTS 19 Amy Croft Drive, Unit #201 Tecumseh, Ontario N9K 1C7

PREPARED BY:

ALEO ASSOCIATES INC. 804 Erie Street East, Suite 100 Windsor, Ontario N9A 3Y4



DATE: MAY 3, 2019 PROJECT No.: 7070

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1.0 INTRODUCTION

Aleo Associates Inc. has been retained by Rock Developments to prepare a functional servicing report for the proposed redevelopment of the property located at 550 Kerr Street in the City of Oakville.

The property is legally described as Part of Block "A", Registered Plan 967 and Part of Lot 16, Concession 3. Refer to plan of survey drawing. The property is bounded by Kerr Street to the North East and existing commercial properties to the north, south, and west. Refer to the site location in Figure 1.

The property is currently a developed site consisting of an existing commercial building and an asphalt paved parking lot. The existing building and parking lot are to be demolished to make way for re-development of the site. A mixed-use development is proposed and will consist of a multi-storey building with commercial on the ground floor and multi-storey residential above. Specifically, the building will have a 6 storey podium with retail/amenities on the ground floor and 5 storey residential above. The building will also consist of three 16 storey residential towers. A total of 473 residential units are proposed. Parking for the site will be provided underground. Refer to the site plan drawing A1.0.

This report has been prepared to demonstrate how the redeveloped land will be serviced for water distribution, wastewater, and storm drainage. The report is provided to the Municipality of Oakville and the Region of Halton to assess the impact of this re-development on the existing infrastructure in reviewing the planning applications for which this report is prepared. All information within this report regarding the existing municipal infrastructure was obtained from as-built drawings provided by the City of Oakville and Region of Halton. The existing as-built drawings were thoroughly reviewed to confirm the existing municipal infrastructure surrounding the site.

2.0 Water Servicing

A 300 mm diameter PVC watermain is located within the Kerr Street right-of-way. Sizes and locations of existing water service connections to the site are unknown at this time and further investigation will be required during detailed design. If existing water service connections are inadequate in size, they are to be abandoned in accordance with Region of Halton standards.

The proposed development will continue to be serviced by the 300 mm diameter watermain on Kerr Street. New water service connections are likely required. The development shall have separate water services for fire and potable water. This will require two separate connections to the municipal watermain in accordance with Region of Halton standards. At the time this report was written, hydrant flow tests had not yet been performed on the Kerr Street watermain. The developer will be required to verify the flow and residual pressure within this main to confirm there is adequate demand. This report shall be resubmitted with the results. The residential towers will require booster pumps for the fire protection system and domestic water service. For the purpose of this report, it is expected that the 300 mm watermain will have adequate flow and pressure to service the development.

3.0 Sanitary Servicing

The property is tributary to an existing 300 mm diameter PVC sanitary sewer which is located along the frontage of the property within the Kerr Street right-of-way. This sanitary sewer flows easterly along Kerr Street. The upstream most end of this sanitary sewer system is a sanitary manhole located in the Kerr Street roadway, approximately 50.0 m South East of Shepherd Road. This indicates that the 300 mm diameter sanitary sewer is tributary only to the properties on Kerr Street between Shepherd Road and Speers Road. The existing 300 mm diameter sewer has a slope of 0.60% slope which provides a capacity of 75 L/s. Refer to Appendix 'A' for the existing sanitary sewer capacity calculation.

The existing sewage flow rate from the property was estimated using the current criteria set forth in the Region of Halton Water & Wastewater Design Manual. The existing site would be considered light commercial with a population density of 90 persons per hectare. On a 1.04 hectare site, and using a flow rate of 0.286 L/ha/s, this yields an existing peak sewage flow of 1.6 L/s including infiltration. Refer to Appendix 'A' for the existing peak sewage flow calculation.

The Region of Halton Water & Wastewater Design Manual was referenced to calculate the sanitary design flows for the proposed development. Population densities of 90 persons per hectare were used for light commercial and an average of 1.8 persons per unit was used for residential. Average daily flows of 275 L/cap/day and 24,750 L/ha/day were used for residential and light commercial, respectively. The entire development will generate a peak flow of 12.0 L/s including infiltration. Refer to Appendix 'A' for the proposed peak sewage flow calculation.

The sewage flows from developments within the sanitary sewer tributary area are small relative to the capacity of the sewer (75 L/s). The sewer is largely unutilized and there is substantial capacity available in the existing sanitary sewer to support this proposed development. The sewage drainage system for the proposed development shall continue to discharge to the existing 300 mm diameter municipal sanitary sewer as in the existing condition. A new sanitary connection is likely required, however, an existing private sanitary drain connection to the site may be utilized if it is determined that there is enough capacity to convey the proposed peak sewage flow. Information regarding the size and location of existing private sanitary drain connections to the property are unknown at this time and further investigation will be required during detailed design.

4.0 Storm Servicing

The property is tributary to an existing 375 mm diameter reinforced concrete sewer which is located along the entire frontage of the property within the Kerr Street right-of-way. The upstream end of this storm sewer system begins at a manhole located at the Kerr Street/Shepherd Road intersection. This storm sewer then flows easterly along Kerr Street with an ultimate outfall to Lake Ontario.

The storm drainage for the proposed development shall continue to release into the existing 375 mm diameter storm sewer as in the existing condition. Existing private storm drain connections to the site may be utilized if it is determined that there is enough capacity to convey the developed flow. Information regarding the size and location of existing private storm drain connections to the property are unknown at this time and further investigation will be required during detailed design.

5.0 Stormwater Management

The existing site did not have any stormwater management measures in place and stormwater runoff from the site was discharged to the Kerr Street municipal storm sewer unrestricted. The imperviousness of the site based on the existing conditions was determined to be 90% (allowable runoff coefficient of C=0.90). Using the rational method, this corresponds to an existing (allowable) flow of 196 L/s for a 1:5 year frequency storm event. Refer to Appendix "A" for the calculation of the existing (allowable) runoff coefficient and the existing (allowable) release rate.

The proposed developed runoff coefficient was determined to be 85% (allowable runoff coefficient of C=0.85). Using the rational method, this corresponds to a post-development flow of 189 L/s for a 1:5 year frequency storm event. Refer to Appendix 'A' for the calculation of the proposed (developed) runoff coefficient and the proposed (developed) flow rate. Since the proposed developed runoff coefficient is less than the existing runoff coefficient of the site, the imperviousness of the site will be less than in the existing condition. The slight decrease in the imperviousness of the site is due to an increased landscape area in the proposed site plan design.

There will be a reduction in the stormwater runoff generated from the site and thus a reduction in the rate at which stormwater runoff from the site is released into the municipal storm sewer. Therefore, there will not be any adverse effect on the capacity of the existing municipal storm sewer as a result of the proposed development. Stormwater management for the site will not be required providing that the imperviousness of the developed site does not exceed 90% (runoff coefficient of C=0.90).

Stormwater quality control measures are required to be implemented on site to effectively treat stormwater runoff before it is released into the municipal storm sewer. The MOE Stormwater Management Planning and Design Manual (2003) requires 80% TSS removal for Enhanced (Level 1) protection. It is recommended that an oil and grit separator unit be installed to meet the stormwater quality requirements for enhanced level protection.

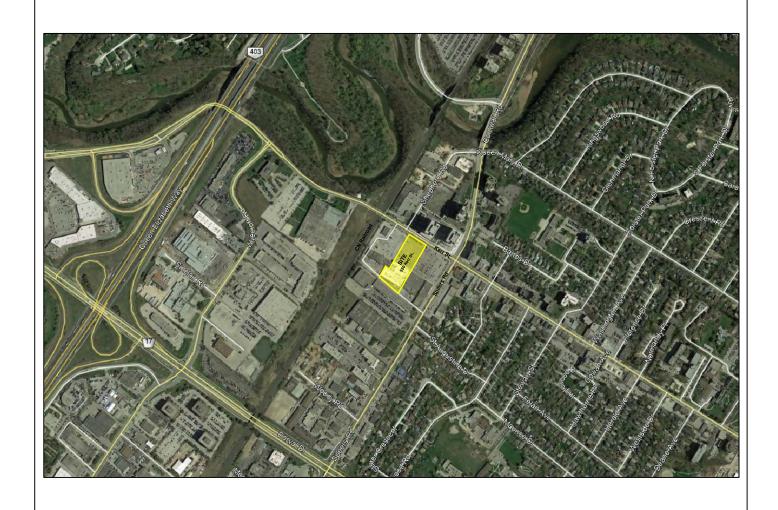
6.0 CONCLUSION

This functional servicing report has established how the redevelopment of this site will be serviced with respect to water distribution, wastewater, and storm drainage without negatively impacting the existing municipal infrastructure.

A summary of the report's conclusions are the following:

- Water servicing for the redevelopment can be provided by the existing 300mm diameter municipal watermain along Kerr Street;
- The existing 300 mm diameter sanitary sewer has substantial capacity available to support the proposed development;
- The proposed site is less impervious than in the existing condition. The stormwater runoff from the developed site will be released into the municipal storm sewer at a lesser rate then in the existing condition. Stormwater management for the site is not required providing that the developed runoff coefficient does not exceed 90% (C=0.90).
- Stormwater quality control measures must be implemented on site to effectively treat stormwater runoff
 from the site before it is released into the municipal storm sewer. All stormwater management measures
 shall provide an "Enhanced" level of protection in accordance with MOE standards.

FIGURES



	ALEO ASSOCIATES INC.
804 ERIE STREE	T EAST, WINDSOR, ONTARIO, CANADA N9A 3Y4
TELEPHONE (51	19) 254–7926 FACSIMILE (519) 254–0895

DATE	PROJECT TITLE	FIGURE No.
MAY 1,2019	REDEVELOPMENT OF 550 KERR STREET	1
SCALE	OAKVILLE, ONTARIO	
NTS		
DRAWN BY	SHEET TITLE	PROJECT No.
DRAWN BY JPA		PROJECT No.
	SHEET TITLE SITE LOCATION	PROJECT No. 7070

APPENDIX 'A'SUPPORTING INFORMATION

ALEO ASSOCIATES INC.

Consulting Engineers

Prepared By: J.P.A. Checked By: P.A.A.

Project Name: 550 Kerr Street, Oakville, ON

Project No.: 7070

FUNCTIONAL SERVICING REPORT RE-DEVELOPMENT OF 550 KERR STREET, OAKVILLE, ONTARIO EXISTING PEAK SEWAGE FLOW

LOCATION			POPULATION				SEWAGE FLOW		
DEVELOPMENT TYPE	DELTA HEC.	TOTAL HEC.	PER HEC.	DELTA POP.	TOTAL POP.	PEAKIN G FACT.	INFIL. I/sec	SEW. I/sec	TOTAL l/sec
LIGHT COMMERCIAL	1.04	1.04	90	94	94	4.25	0.3	1.3	1.6

Design Criteria:

1) Light Commercial Sewage Flow = 0.286 l/ha/s 24,750 l/ha/day 2) Infiltration = 0.286 l/s/ha 24,710 l/ha/day

3) Peak Wastewater Flow Factor, M = 1+14/(4+P^0.5)
4) Manning's Coefficient = 0.013
5) Minimum Velocity = 0.6 m/s
6) Maximum Velocity = 3.0 m/s

ALEO ASSOCIATES INC.

Consulting Engineers

Prepared By: J.P.A. Checked By: P.A.A.

Project Name: 550 Kerr Street, Oakville, ON

Project No.: 7070

FUNCTIONAL SERVICING REPORT REDEVELOPMENT OF 550 KERR STREET, OAKVILLE, ONTARIO PROPOSED PEAK SEWAGE FLOW

LOCATION	POPULATION				SEWAGE FLOW				
DEVELOPMENT TYPE	TOTAL AREA HEC.	PER HEC.	PERS. PER UNIT	NO. UNITS	TOTAL POP.	PEAKING FACT.	INFIL. I/sec	SEW. I/sec	TOTAL l/sec
MULTI-STOREY RESIDENTIAL	1.04	-	1.8	473	851	3.84	-	10.4	10.4
LIGHT COMMERCIAL	1.04	90	-	-	94	4.25	0.3	1.3	1.6
TOTAL DEVELOPMENT	-	-	-	-	945	-	0.3	11.7	12.0

Design Criteria:

1) Residential Population Densities:

216 one bedroom units = 1.4 persons per unit

243 two bedroom units = 2.1 persons per unit

14 three bedroom units = 3.1 persons per unit

Based on 473 total units, the average is 1.8 persons per unit.

 2) Residential Sewage Flow =
 0.00318 l/per/sec
 275 l/cap/day

 3) Light Commercial Sewage Flow =
 0.286 l/ha/s
 24,750 l/ha/day

 4) Infiltration =
 0.286 l/s/ha
 24,710 l/ha/day

5) Peak Wastewater Flow Factor, M = 1+14/(4+P^0.5)
6) Manning's Coefficient = 0.013
7) Minimum Velocity = 0.6 m/s
8) Maximum Velocity = 3.0 m/s

ALEO ASSOCIATES INC., CONSULTING ENGINEERS

804 ERIE STREET EAST, SUITE 100, WINDSOR, ONTARIO, CANADA, N9A 3Y4

PROJECT NAME: 550 Kerr Street,Oakville, ON

PROJECT No.: 7070 PREPARED BY: J.P.A.

FUNCTIONAL SERVICING REPORT
REDEVELOPMENT OF 550 KERR STREET, OAKVILLE, ON
CAPACITY OF EXISTING 300 mm DIA. MUNICIPAL SANITARY SEWER

A. CAPACITY OF EXISTING 300 mm DIA. MUNICIPAL SANITARY SEWER:

Using Mannings equation for full flow condition,

 $Qf = (0.312/n) * ((d)^{(8/3)}) * (s)^{(1/2)}$

n = 0.013

Diameter, d = 0.30 m (300 mm)Slope, S = 0.60% (0.0060)

Qf = 75 L/s

ALEO ASSOCIATES INC., CONSULTING ENGINEERS

804 ERIE STREET EAST, SUITE 100, WINDSOR, ONTARIO, CANADA, N9A 3Y4

PROJECT NAME: Redevelopment of 550 Kerr Street

PROJECT No.: 7070 PREPARED BY: J.P.A.

DATE: April 24, 2019

FILE NAME: 7070_1-100yr_Det_2019.04.24.xlsx

FUNCTIONAL SERVICING REPORT

REDEVELOPMENT OF 550 KERR STREET, OAKVILLE, ON

CALCULATION OF RUN-OFF COEFFICIENTS AND THE ALLOWABLE & DEVELOPED FLOWS

A. EXISTING SITE CONDITIONS:

Total Existing Drainage Area =	10,345 sq.m.	1.04 ha	Cdev
Total Existing Building Roof Area =	3,764 sq.m.	0.38 ha	C = 0.95
Total Existing Asphalt & Concrete Area =	6,296 sq.m.	0.63 ha	C = 0.90
Total Existing Landscape Area =	285 sq.m.	0.03 ha	C = 0.20

B. PROPOSED SITE CONDITIONS:

Total Proposed Drainage Area =	10,345 sq.m.	1.04 ha	Cdev
Total Proposed Building Roof Area =	5,000 sq.m.	0.50 ha	C = 0.95
Total Proposed Asphalt & Concrete Area =	4,199 sq.m.	0.42 ha	C = 0.90
Total Proposed Landscape Area =	1,146 sq.m.	0.11 ha	C = 0.20

C. RUNOFF COEFFICIENTS:

EXISTING(allowable):	Cex. =	(3,764 m ² x 0.95) + (6,296 m ² x 0.90) + (285 m ² x 0.20)
		10,345 m ²

Cex.= 0.90

PROPOSED: Cdev. = $(5,000 \text{ m}^2 \times 0.95) + (4,199 \text{ m}^2 \times 0.90) + (1,146 \text{ m}^2 \times 0.20)$

10,345 m²

Cdev.= 0.85

D. EXISTING (ALLOWABLE) DISCHARGE FOR 1:5 YEAR FREQUENCY STORM:

Average Runoff Coefficient, Cund = 0.90

Tc = 20 minutes
Intensity, i = 75.5 mm/hr

Where Intensity, $i = 1170 / (Tc + 5.8)^{(0.843)}$,

for AES Toronto (Bloor Street) 1:5 year frequency storm

Qund = Cund * i * A = 2.78 * 0.90 * i * 1.04 = 2.60 * i = 196 L/s

E. POST-DEVELOPMENT DISCHARGE FOR 1:5 YEAR FREQUENCY STORM:

Average Runoff Coefficient, Cund = 0.85

Tc = 20 minutes Intensity, i = 75.5 mm/hr

Where Intensity, $i = 1170 / (Tc + 5.8)^{(0.843)}$,

for AES Toronto (Bloor Street) 1:5 year frequency storm

Qund = Cund * i * A = 2.78 * 0.85 * i * 1.04 = 2.50 * i = 189 L/s

F. CONCLUSION:

Since the proposed post-development runoff coefficient (C=0.85) is less than the existing (allowable) site runoff coefficient (C=0.90), the imperviousness of the site will be reduced. The proposed post-developent release rate will be less than the existing (allowable) release rate. Therefore, there there will not be any adverse effect on the capacity of the existing municipal storm sewer as a result of the proposed development.

