

---

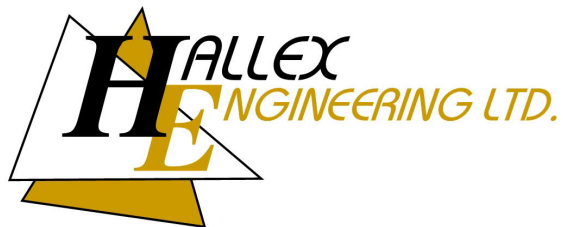
CORKTOWN APARTMENTS  
200 FOREST AVENUE, HAMILTON

---

FUNCTIONAL SERVICING DESIGN BRIEF  
NEW STORM, SANITARY AND WATER SERVICES

REV 0 – March 11, 2021

PREPARED BY:



HALLEX PROJECT #190714

HALLEX NIAGARA  
4999 VICTORIA AVENUE  
NIAGARA FALLS, ON L2E 4C9

HALLEX HAMILTON  
745 SOUTH SERVICE ROAD, UNIT 205  
STONE CREEK, ON L8E 5Z2

## **INTRODUCTION**

The proposed three storey apartment building development consists of the construction of a new building on the existing Corktown Apartments property which shall be amalgamated with 2 single family properties in the City of Hamilton. The existing site consists of a four-storey apartment residential building with a parking area at the back of the building and two single family dwellings with paved / gravel driveways and grass areas. The existing apartment building shall remain whereas the two single family dwellings will be demolished and the parking lot shall be redeveloped for the proposed building.

The purpose of the service assessment is to determine the functional sizing of the proposed storm, sanitary and water services in addition to the post-development flows from the site to determine the impact on the existing municipal infrastructure.

## **EXISTING MUNICIPAL INFRASTRUCTURE**

The current drainage path for the site consists of an existing storm sewer system onsite connecting to the municipal combined sewer at Forest Avenue and the municipal storm sewer Aurora Street. The two existing catchbasins located north of the existing four-storey building connect to the 600mm diameter municipal combined sewer at Forest Avenue. The remainder of the site drains to the 500mm diameter municipal storm sewer at Aurora Street via the existing storm sewer on the property.

## **PRE-DEVELOPMENT SITE FLOW**

The subject site has a total area of 0.506 hectares with a blended runoff coefficient of 0.72 based on the recommended runoff coefficients for apartments and single family residential as per the City of Hamilton Development Guidelines. The catchment area plan for the pre-development site conditions is provided on Hallex Sketch CSK1, attached.

Utilizing the rationale method ( $Q = CiA/360$ ) and the minimum recommended time of concentration of 10 minutes, the allowable peak flow for the pre-development site is as follows:

<u>Storm Event</u>	<u>Pre-Development Site</u>
5 years	104.6 L/s
100 years	184.6 L/s

These flows are calculated using the City of Hamilton intensity-duration-frequency curves.

## **POST-DEVELOPMENT SITE FLOW**

The proposed development includes a three-storey apartment building complete with a redeveloped parking lot. The grading for the site will ensure drainage through the existing / proposed storm sewer system for storm water quantity and quality controls. The total drainage for the site has an area of 0.506 hectares with a calculated runoff coefficient of 0.71 based on the existing and proposed roof, paved and grass surface areas. The proposed storm sewer system for

the new building and parking lot will continue to discharge to the 500mm diameter municipal storm sewer at Aurora Street. The catchment area plan for the post-development site conditions is provided on Hallex Sketch CSK2, attached.

Utilizing the rationale method ( $Q = CiA/360$ ) and the minimum recommended time of concentration of 10 minutes, the calculated peak flow for the post-development site is as follows:

<u>Storm Event</u>	<u>Post-Development Site</u>
5 years	101.8 L/s
100 years	179.8 L/s

These flows are calculated using the City of Hamilton intensity-duration-frequency curves. The post-development flows for the proposed development are provided in Exhibit #1 for the 5-year storm, Exhibit #2 for the 100-year storm, attached.

### **STORMWATER QUANTITY CONTROL**

The post-development storm water runoff for Area.1 will remain unaltered by the development. As such, no controls are proposed for this drainage area.

The post-development storm water runoff includes an additional area, Area.2, draining to Charlton Avenue. The existing 500mm municipal storm sewer at Charlton Avenue drains to the 500mm municipal storm sewer at Aurora Street. As such, no controls are proposed for this drainage area.

The post-development storm water runoff for the subject site will decrease by 2.6 L/s for the five-year storm and 4.8 L/s for the one-hundred-year storm. As such, storm water detention is not proposed for the development.

### **STORMWATER QUALITY CONTROL**

Stormwater quality controls for the site can be achieved by utilizing a Hydrostorm HS-5 prior to the sewer connection at Aurora Street. This will achieve a total suspended solids removal of at least 75% based on the above post-development site conditions. This value is greater than the required 'Normal' treatment of 70% as indicated in the MOE Stormwater Management Planning and Design Manual, dated March 2003 (refer to Chapter 3: Environmental Design Criteria, Section 3.3.1.1. Level of Protection).

### **SANITARY**

The existing Corktown Apartment building is currently serviced and is connected to the existing 600mm diameter municipal combined sewer at Forest Avenue. The two existing single-family dwellings are currently serviced and appear to be connected to the existing 500mm diameter municipal combined sewer at Charlton Avenue. Given the south side of the site is to be completely redeveloped, the existing services for the single-family dwellings are to be located,

capped and abandoned at the municipal combined sewer. A new sanitary service is proposed to be installed from the new three-storey apartment building to the existing 500mm diameter municipal combined sewer at Charlton Avenue.

The building development is currently in the concept phase; therefore, the following assumptions are made in carrying out the calculations based on the architectural drawings.

- The building consists of 13 one-bedroom units and 4 five-bedroom unit where each unit would have a maximum of 2 persons per bedroom.
- The plumbing fixtures and the number of plumbing fixtures indicated in Exhibit #1 are assumed and may not represent the final building plumbing design.

The wastewater generation for the proposed development is determined to be 14,850 L/day using Table 8.2.1.3A of the Ontario Building Code as shown in Exhibit #3. The peak drainage rate for the proposed development is determined to be 340.7 L/min based on the fixtures and fixture units shown in Exhibit #1 attached. Table 7.4.10.5 in the Ontario Building Code is used to determine probable peak drainage rates for the total fixture units.

Based on the above, Hallex recommends a minimum 200mm diameter sanitary sewer @ 1.0% to be installed to convey sanitary flows from the proposed apartment building to the existing 500mm diameter municipal combined sewer at Charlton Avenue.

## **WATER**

The existing Corktown Apartment building is currently serviced and is connected to the existing 150mm diameter municipal watermain at Aurora Street. The two existing single-family dwellings are currently serviced and appear to be connected to the existing 150mm diameter municipal watermain at Charlton Avenue. Given the south side of the site is to be completely redeveloped, the existing services for the single-family dwellings are to be located, capped and abandoned at the municipal watermain. A new water service is proposed to be installed from the new three-storey apartment building to the existing 150mm diameter municipal watermain at Charlton Avenue.

The building development is currently in the concept phase; therefore, the following assumptions are made in carrying out the calculations based on the architectural drawings.

- The plumbing fixtures and the number of plumbing fixtures indicated in Exhibit #1 are assumed and may not represent the final building plumbing design.
- Each building is assumed to be fire resistive, of ordinary construction and will not have sprinklers or hose cabinets installed throughout the building.

The domestic water demand for the proposed development is determined to be 350.6 L/min based on the fixtures and fixture units shown in Exhibit #3 attached. Table 7.4.10.5 in the Ontario Building Code is used to determine water demands for the total fixture units

Using the calculations provided in the Fire Underwriters Survey – 1999 Water Supply for Public Fire Protection the minimum water supply flow rate for fire protection is determined to be 10,000 L/min for the building, based on the above assumptions as shown in Exhibit #4, attached. There are three existing municipal fire hydrants located near the site. The first is located

immediately north of the property (i.e. on the south side of Forest Avenue). The second is located immediately east of the property (i.e. on the west side of Aurora Street). The third is located approximately 5.8m east of the south east corner of the property (i.e. on the north side of Charlton Avenue).

Based on the above, Hallex recommends a 100mm diameter domestic water service to be installed from the proposed apartment building to the existing 150mm diameter municipal watermain at Charlton Avenue.

## CONCLUSION

The aforementioned calculations and recommendations for the storm, sanitary and water services are based on the current design for the site.

We trust this letter meets your approval. Please contact the undersigned should you have any questions or comments.

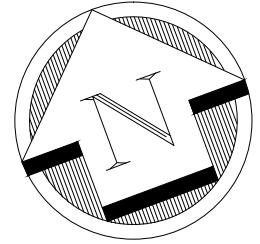
Yours truly,  
HALLEX ENGINEERING LTD



Jim Halucha P.Eng  
Civil/Structural Engineer

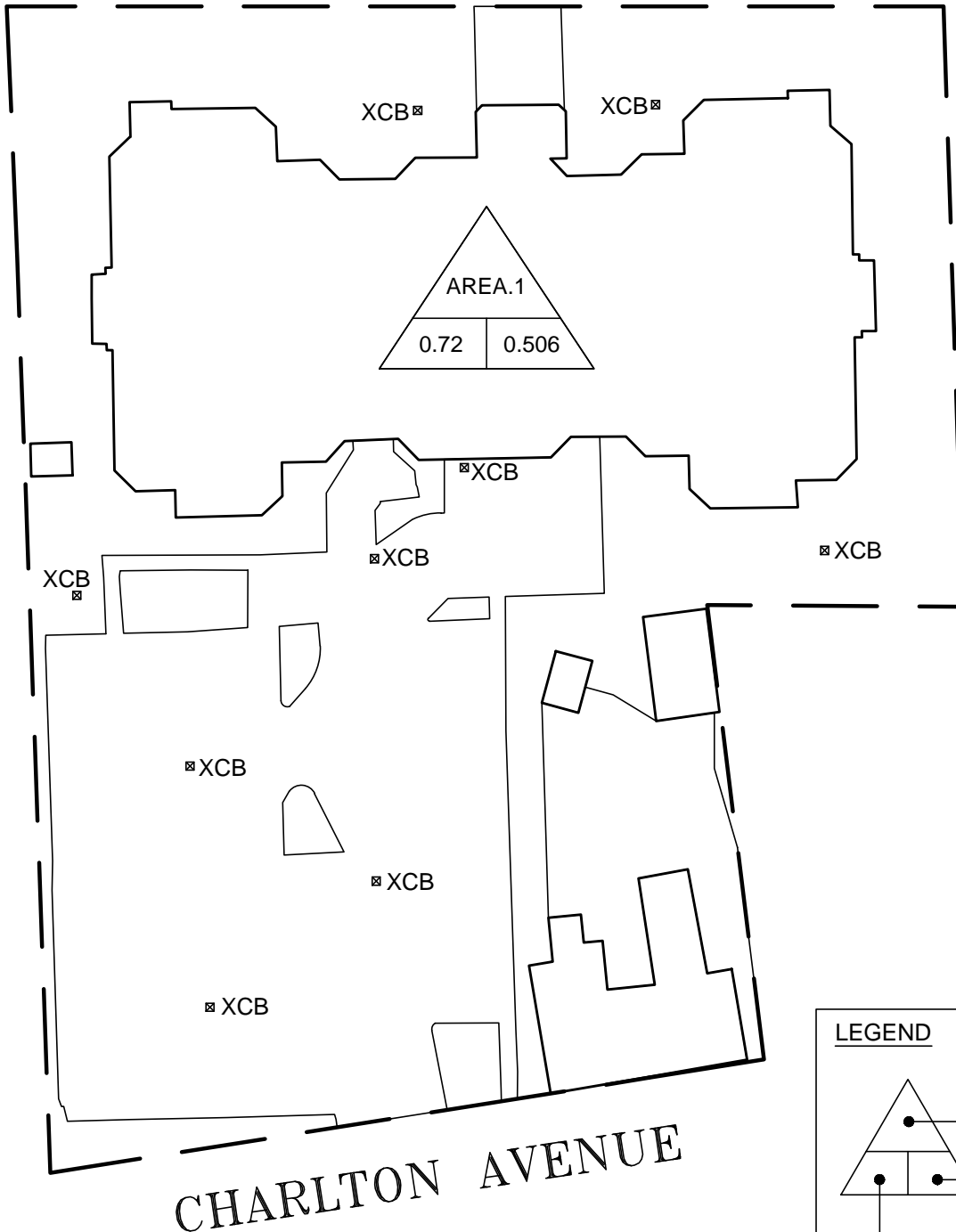
A handwritten signature in blue ink, appearing to read "Jonathan Skinner".

Jonathan Skinner, C.E.T., B.Tech  
Civil Technologist

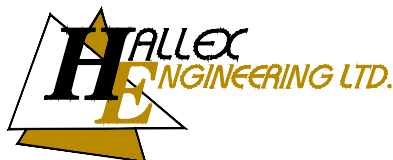
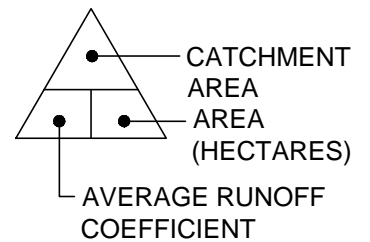


# FOREST AVENUE

AURORA STREET



### LEGEND



4999 Victoria Avenue, Niagara Falls, ON L2E 4C9  
 745 South Service Rd. Unit 205, Stoney Creek, ON L8E 5Z2  
 Tel: 905-357-4015 Fax: 905-353-1105  
 Tel: 905-561-4016 Fax: 905-561-1105

**PROJECT:**  
 CORKTOWN APARTMENTS  
 200 FOREST AVENUE, HAMILTON, ON

**SHEET TITLE:**  
 PRE-DEVELOPMENT CATCHMENT AREAS

**DATE:** 03/11/2021

**JOB No.:** 190714

**SCALE:** 1:500

**DWG.**

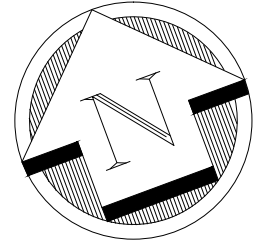
**REV.**

**DR. BY:** JS

CSK1

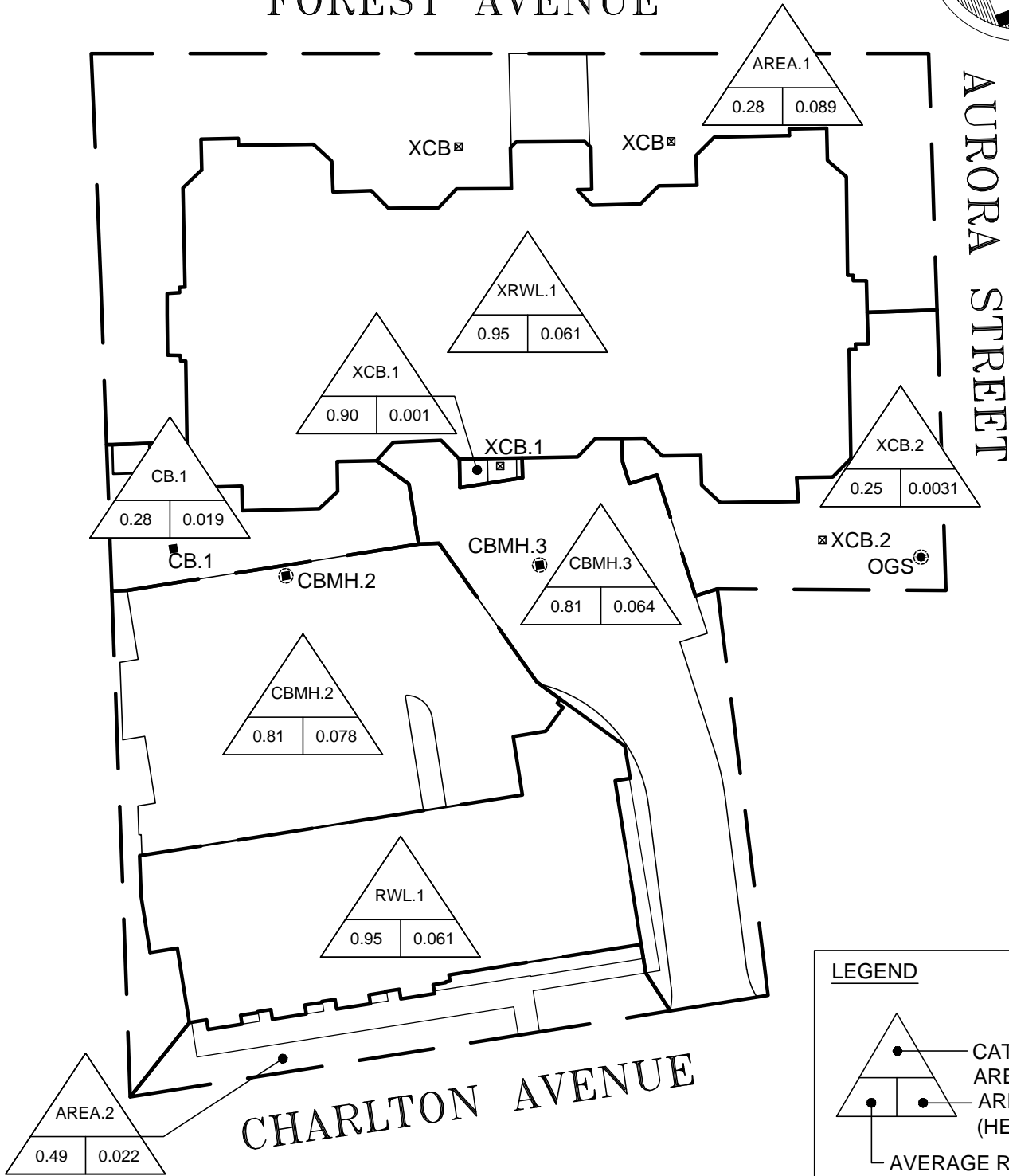
0

**CH. BY:** JH



# FOREST AVENUE

AURORA STREET



**LEGEND**

● CATCHMENT AREA  
 — AREA (HECTARES)  
 — AVERAGE RUNOFF COEFFICIENT

4999 Victoria Avenue,  
 Niagara Falls, ON L2E 4C9  
 Tel: 905-357-4015 Fax: 905-353-1105

745 South Service Rd. Unit 205,  
 Stoney Creek, ON L8E 5Z2  
 Tel: 905-561-4016 Fax: 905-561-1105

**PROJECT:**  
 CORKTOWN APARTMENTS  
 200 FOREST AVENUE, HAMILTON, ON

**SHEET TITLE:**  
 POST-DEVELOPMENT CATCHMENT AREAS

**DATE:** 03/11/2021  
**SCALE:** 1:500  
**DR. BY:** JS  
**CH. BY:** JH

**JOB No.:** 190714  
**DWG.:** CSK2  
**REV.:** 0



### Corktown Apartments Exhibit #1 - 5 Year Post - Development Calculations

3/11/2021  
Job: 190714

Rainfall Intensity Values =  
 A= 1049.500  
 B= 8.000  
 C= 0.803

manning's n =  
 0.013 PVC Pipe  
 0.013 Conc Pipe  
 0.024 Corr. Stl Pipe  
 0.035 Grass Swale

HAMILTON - 5 Year Storm



Pipe	Location		Length of Pipe (m)	Area		Flow Time		Rainfall Intensity mm/hr	Unit rate of Runoff m <sup>3</sup> /ha*day	Design Flows		Sewer/Channel Design				Invert Elevations	
	From Node	To Node		Increment (ha)	Cum Total (ha)	To Upper (min)	In Section (min)			Cum Flow (m <sup>3</sup> /d)	Cum Flow (m <sup>3</sup> /s)	Slope (m/m)	Capacity Full (m <sup>3</sup> /s)	Velocity Full (m/s)	*Dia/ Depth (m)	Up- stream (m)	Down- stream (m)
<b>1</b>	<b>Area 1</b>	<b>Street 1</b>	<b>N/A</b>	<b>0.089</b>	<b>0.089</b>	<b>10.00</b>	<b>N/A</b>	<b>103</b>	<b>28439</b>	<b>630.6</b>	<b>0.0073</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
Paved	-	-	-	0.005	-	-	-	-	22256.3	111.3	-	-	-	-	-	-	-
Grass	-	-	-	0.084	-	-	-	-	6182.3	519.3	-	-	-	-	-	-	-
<b>2</b>	<b>Area 2</b>	<b>Street 2</b>	<b>N/A</b>	<b>0.022</b>	<b>0.022</b>	<b>10.00</b>	<b>N/A</b>	<b>103</b>	<b>28439</b>	<b>264.6</b>	<b>0.0031</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
Paved	-	-	-	0.008	-	-	-	-	22256.3	178.1	-	-	-	-	-	-	-
Grass	-	-	-	0.014	-	-	-	-	6182.3	86.6	-	-	-	-	-	-	-
<b>3</b>	<b>CB. 1</b>	<b>CBMH. 2</b>	<b>8.7</b>	<b>0.019</b>	<b>0.019</b>	<b>10.00</b>	<b>0.11</b>	<b>103</b>	<b>29675</b>	<b>134.8</b>	<b>0.0016</b>	<b>0.0100</b>	<b>0.0967</b>	<b>1.3680</b>	<b>0.300</b>	<b>99.67</b>	<b>99.58</b>
Roof	-	-	-	0.001	-	-	-	-	23492.7	23.5	-	-	-	-	-	-	-
Grass	-	-	-	0.018	-	-	-	-	6182.3	111.3	-	-	-	-	-	-	-
<b>4</b>	<b>CBMH. 2</b>	<b>CBMH. 3</b>	<b>19.9</b>	<b>0.078</b>	<b>0.097</b>	<b>10.11</b>	<b>0.22</b>	<b>103</b>	<b>28300</b>	<b>1686.3</b>	<b>0.0195</b>	<b>0.0130</b>	<b>0.1103</b>	<b>1.5598</b>	<b>0.300</b>	<b>99.55</b>	<b>99.29</b>
Paved	-	-	-	0.067	-	-	-	-	22147.7	1483.9	-	-	-	-	-	-	-
Grass	-	-	-	0.011	-	-	-	-	6152.1	67.7	-	-	-	-	-	-	-
<b>5</b>	<b>XCB. 1</b>	<b>XRWL 1</b>	<b>3.2</b>	<b>0.001</b>	<b>0.001</b>	<b>10.00</b>	<b>0.02</b>	<b>103</b>	<b>22256</b>	<b>22.3</b>	<b>0.0003</b>	<b>0.1100</b>	<b>0.3207</b>	<b>4.5373</b>	<b>0.300</b>	<b>99.99</b>	<b>99.63</b>
Paved	-	-	-	0.001	-	-	-	-	22256.3	22.3	-	-	-	-	-	-	-
<b>6</b>	<b>XRWL 1</b>	<b>CBMH. 3</b>	<b>8.3</b>	<b>0.141</b>	<b>0.142</b>	<b>10.02</b>	<b>0.11</b>	<b>103</b>	<b>23472</b>	<b>3331.8</b>	<b>0.0386</b>	<b>0.0100</b>	<b>0.0967</b>	<b>1.3680</b>	<b>0.300</b>	<b>99.34</b>	<b>99.25</b>
Roof	-	-	-	0.141	-	-	-	-	23471.8	3309.5	-	-	-	-	-	-	-
<b>7</b>	<b>RWL</b>	<b>CBMH. 3</b>	<b>11.8</b>	<b>0.061</b>	<b>0.061</b>	<b>10.00</b>	<b>0.15</b>	<b>103</b>	<b>23493</b>	<b>1433.1</b>	<b>0.0166</b>	<b>0.0100</b>	<b>0.0967</b>	<b>1.3680</b>	<b>0.300</b>	<b>99.54</b>	<b>99.42</b>
Roof	-	-	-	0.061	-	-	-	-	23492.7	1433.1	-	-	-	-	-	-	-
<b>8</b>	<b>XCB. 2</b>	<b>CBMH. 3</b>	<b>1.0</b>	<b>0.031</b>	<b>0.031</b>	<b>10.00</b>	<b>0.01</b>	<b>103</b>	<b>6182</b>	<b>191.7</b>	<b>0.0022</b>	<b>0.8600</b>	<b>0.8968</b>	<b>12.6866</b>	<b>0.300</b>	<b>99.80</b>	<b>98.94</b>
Grass	-	-	-	0.031	-	-	-	-	6182.3	191.7	-	-	-	-	-	-	-
<b>9</b>	<b>CBMH. 3</b>	<b>OGS</b>	<b>30.5</b>	<b>0.064</b>	<b>0.395</b>	<b>10.33</b>	<b>0.15</b>	<b>102</b>	<b>28027</b>	<b>7904.0</b>	<b>0.0915</b>	<b>0.0340</b>	<b>0.6963</b>	<b>3.5460</b>	<b>0.500</b>	<b>99.22</b>	<b>98.18</b>
Paved	-	-	-	0.055	-	-	-	-	21933.9	1206.4	-	-	-	-	-	-	-
Grass	-	-	-	0.009	-	-	-	-	6092.8	54.8	-	-	-	-	-	-	-
<b>10</b>	<b>OGS</b>	<b>Street 3</b>	<b>9.7</b>	<b>0.000</b>	<b>0.395</b>	<b>10.48</b>	<b>0.05</b>	<b>101</b>	<b>0</b>	<b>7904.0</b>	<b>0.0915</b>	<b>0.0340</b>	<b>0.6963</b>	<b>3.5460</b>	<b>0.500</b>	<b>98.14</b>	<b>97.81</b>

Run-off Coefficients Used:

Roof Structure      C = 0.95  
 Paved Surface      C = 0.90  
 Grass Surface      C = 0.25

Velocity Range:

Minimum Velocity = 0.75 m/s  
 Maximum Velocity = 3.65 m/s

Time of Concentration:

Time of Concentration = 10 min





**Corktown Apartments  
Exhibit #2 - 100 Year Post - Development Calculations**

3/11/2021  
Job: 190714

HAMILTON - 100 Year Storm



Rainfall Intensity Values =  
 A= 2317.400  
 B= 11.000  
 C= 0.836

mannings n =  
 0.013 PVC Pipe  
 0.013 Conc Pipe  
 0.024 Corr. Stl Pipe  
 0.035 Grass Swale

Location			Length of Pipe	Area		Flow Time		Rainfall Intensity	Unit rate of Runoff	Design Flows		Sewer/Channel Design				Invert Elevations	
Pipe	From Node	To Node		Increment	Cum Total	To Upper	In Section			Cum Flow	Cum Flow	Slope	Capacity Full	Velocity Full	*Dia/Depth	Up-stream	Down-stream
			(m)	(ha)	(ha)	(min)	(min)	mm/hr	m <sup>3</sup> /ha*day	(m <sup>3</sup> /d)	(m <sup>3</sup> /s)	(m/m)	(m <sup>3</sup> /s)	(m/s)	(m)	(m)	(m)
<b>1</b>	<b>Area 1</b>	<b>Street 1</b>	<b>N/A</b>	<b>0.089</b>	<b>0.089</b>	<b>10.00</b>	<b>N/A</b>	<b>182</b>	<b>50180</b>	<b>1112.7</b>	<b>0.0129</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
Paved	-	-	-	0.005	-	-	-	-	39271.7	196.4	-	-	-	-	-	-	-
Grass	-	-	-	0.084	-	-	-	-	10908.8	916.3	-	-	-	-	-	-	-
<b>2</b>	<b>Area 2</b>	<b>Street 2</b>	<b>N/A</b>	<b>0.022</b>	<b>0.022</b>	<b>10.00</b>	<b>N/A</b>	<b>182</b>	<b>50180</b>	<b>466.9</b>	<b>0.0054</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
Paved	-	-	-	0.008	-	-	-	-	39271.7	314.2	-	-	-	-	-	-	-
Grass	-	-	-	0.014	-	-	-	-	10908.8	152.7	-	-	-	-	-	-	-
<b>3</b>	<b>CB. 1</b>	<b>CBMH. 2</b>	<b>8.7</b>	<b>0.019</b>	<b>0.019</b>	<b>10.00</b>	<b>0.11</b>	<b>182</b>	<b>52362</b>	<b>237.8</b>	<b>0.0028</b>	<b>0.0100</b>	<b>0.0967</b>	<b>1.3680</b>	<b>0.300</b>	<b>99.67</b>	<b>99.58</b>
Roof	-	-	-	0.001	-	-	-	-	41453.4	41.5	-	-	-	-	-	-	-
Grass	-	-	-	0.018	-	-	-	-	10908.8	196.4	-	-	-	-	-	-	-
<b>4</b>	<b>CBMH. 2</b>	<b>CBMH. 3</b>	<b>19.9</b>	<b>0.078</b>	<b>0.097</b>	<b>10.11</b>	<b>0.22</b>	<b>181</b>	<b>49962</b>	<b>2977.0</b>	<b>0.0345</b>	<b>0.0130</b>	<b>0.1103</b>	<b>1.5598</b>	<b>0.300</b>	<b>99.55</b>	<b>99.29</b>
Paved	-	-	-	0.067	-	-	-	-	39100.5	2619.7	-	-	-	-	-	-	-
Grass	-	-	-	0.011	-	-	-	-	10861.3	119.5	-	-	-	-	-	-	-
<b>5</b>	<b>XCB. 1</b>	<b>XRWL 1</b>	<b>3.2</b>	<b>0.001</b>	<b>0.001</b>	<b>10.00</b>	<b>0.02</b>	<b>182</b>	<b>39272</b>	<b>39.3</b>	<b>0.0005</b>	<b>0.1100</b>	<b>0.3207</b>	<b>4.5373</b>	<b>0.300</b>	<b>99.99</b>	<b>99.63</b>
Paved	-	-	-	0.001	-	-	-	-	39271.7	39.3	-	-	-	-	-	-	-
<b>6</b>	<b>XRWL 1</b>	<b>CBMH. 3</b>	<b>8.3</b>	<b>0.141</b>	<b>0.142</b>	<b>10.02</b>	<b>0.11</b>	<b>182</b>	<b>41420</b>	<b>5879.6</b>	<b>0.0681</b>	<b>0.0100</b>	<b>0.0967</b>	<b>1.3680</b>	<b>0.300</b>	<b>99.34</b>	<b>99.25</b>
Roof	-	-	-	0.141	-	-	-	-	41420.5	5840.3	-	-	-	-	-	-	-
<b>7</b>	<b>RWL</b>	<b>CBMH. 3</b>	<b>11.8</b>	<b>0.061</b>	<b>0.061</b>	<b>10.00</b>	<b>0.15</b>	<b>182</b>	<b>41453</b>	<b>2528.7</b>	<b>0.0293</b>	<b>0.0100</b>	<b>0.0967</b>	<b>1.3680</b>	<b>0.300</b>	<b>99.54</b>	<b>99.42</b>
Roof	-	-	-	0.061	-	-	-	-	41453.4	2528.7	-	-	-	-	-	-	-
<b>8</b>	<b>XCB. 2</b>	<b>CBMH. 3</b>	<b>1.0</b>	<b>0.031</b>	<b>0.031</b>	<b>10.00</b>	<b>0.01</b>	<b>182</b>	<b>10909</b>	<b>338.2</b>	<b>0.0039</b>	<b>0.8600</b>	<b>0.8968</b>	<b>12.6866</b>	<b>0.300</b>	<b>99.80</b>	<b>98.94</b>
Grass	-	-	-	0.031	-	-	-	-	10908.8	338.2	-	-	-	-	-	-	-
<b>9</b>	<b>CBMH. 3</b>	<b>OGS</b>	<b>30.5</b>	<b>0.064</b>	<b>0.395</b>	<b>10.33</b>	<b>0.15</b>	<b>179</b>	<b>49531</b>	<b>13952.3</b>	<b>0.1615</b>	<b>0.0340</b>	<b>0.6963</b>	<b>3.5460</b>	<b>0.500</b>	<b>99.22</b>	<b>98.18</b>
Paved	-	-	-	0.055	-	-	-	-	38763.1	2132.0	-	-	-	-	-	-	-
Grass	-	-	-	0.009	-	-	-	-	10767.5	96.9	-	-	-	-	-	-	-
<b>10</b>	<b>OGS</b>	<b>Street 3</b>	<b>9.7</b>	<b>0.000</b>	<b>0.395</b>	<b>10.48</b>	<b>0.05</b>	<b>178</b>	<b>0</b>	<b>13952.3</b>	<b>0.1615</b>	<b>0.0340</b>	<b>0.6963</b>	<b>3.5460</b>	<b>0.500</b>	<b>98.14</b>	<b>97.81</b>

Run-off Coefficients Used:

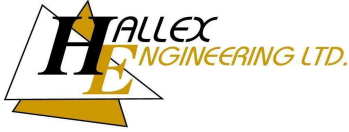
Roof Structure      C = 0.95  
 Paved Surface      C = 0.90  
 Grass Surface      C = 0.25

Velocity Range:

Minimum Velocity = 0.75 m/s  
 Maximum Velocity = 3.65 m/s

Time of Concentration:

Time of Concentration = 10 min



**Corktown Apartments**  
**Exhibit #3 - Wastewater Generation**  
**Rate and Water Demand**

3/11/2021  
 Job: 190714

**WASTEWATER GENERATION ASSESSMENT**

Unit Type	# of Units	Occupant Load (People / Area)	Volume (L) (Table 8.2.1.3A/B)	Total Daily Volume (L)
1 Bedroom Apartments	13	26	275	7150
5 Bedroom Apartments	4	40	275	11000
			Total =	18150 L/day

Therefore the total calculated sanitary flow from the site is determined to be 18,150 L/day.

**MAXIMUM PROBABLE DRAINAGE RATE**

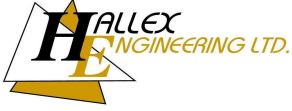
Fixture	Fixture Units (Table 7.4.9.3.)	Fixtures per Unit	# of Units	Total Sanitary Fixture Units
	(FU)	(#)	(#)	(FU)
Bathroom Group (1 Bedroom)	6.0	1	13	78.0
Bathroom Group (5 Bedroom)	6.0	3	4	72.0
Kitchen Sink	1.5	1	17	25.5
Dishwasher	1.0	1	17	17.0
Washing Machine	1.5	1	17	25.5
			Total =	218 FU
			Total Flow =	340.7 L/min

Therefore the total calculated peak drainage rate is determined to be 340.7 L/min.

**DOMESTIC WATER SUPPLY**

Fixture	Fixture Units (Table 7.4.9.3.)	Fixtures per Unit	# of Units	Total Water Fixture Units
	(FU)	(#)	(#)	(FU)
	6.0	1	13	78.0
Bathroom Group (2 Bedroom)	6.0	3	4	72.0
Kitchen Sink	2.0	1	17	34.0
Dishwasher	1.4	1	17	23.8
Washing Machine	1.4	1	17	23.8
			Total =	231.6 FU
			Total Flow =	350.6 L/min

Therefore the maximum domestic water demand is determined to be 350.6 L/min.



# Corktown Apartments Exhibit #4 - Fire Water Demand

3/11/2021  
Job: 201103

## FIRE WATER SUPPLY

Building Type: Fire Resistive

<u>Floor Area</u>		<u>Reduct.</u>	
First Floor	611.2 m <sup>2</sup>	1.00	611.2 m <sup>2</sup>
Second Floor	611.2 m <sup>2</sup>	1.00	611.2 m <sup>2</sup>
Third Floor	611.2 m <sup>2</sup>	0.50	305.6 m <sup>2</sup>
			1528 m <sup>2</sup>

Construction Type: Ordinary Construction      Construction Coefficient:

1st Preliminary Fire Flow =                      9000 L/min

Fire Hazard: Non-Combustible                      Fire Hazard Factor:   
Net Decrease =    -2250 L/min

2nd Preliminary Fire Flow =                      6750 L/min

Sprinkler System: No System                      Sprinkler System Factor:   
No Change =    0 L/min

Separation Factor

North	20.0 m	0.15
South	23.9 m	0.10
West	14.6 m	0.15
East	11.4 m	0.15
		0.55

Net Increase =    3712.5 L/min

**FINAL FIRE FLOW =                      10000.0 L/min**

Minimum Water Supply Flow Rate for Fire Protection as determined by the Water Supply For Public Fire Protection, dated 1999, by the Fire Underwriter's Survey