



September 19, 2017  
Our File: 416115

City of Guelph  
Planning Division  
City Hall – 1 Carden Street  
Guelph, ON N1H 3A1

Re: Preliminary Site Servicing  
Stormwater Management Letter  
Churchill Court  
75 Dublin Street North  
City of Guelph  
**REVISED**

Dear Sir/Madam,

GM BluePlan Engineering Limited has prepared this revised preliminary site servicing and stormwater management letter in support of the proposed re-development and official plan amendment of 75 Dublin Street North in the City of Guelph.

This preliminary site servicing and stormwater management letter has been prepared based on the Concept Plan prepared by Astrid J. Clos Planning Consultant (dated October 24, 2016).

## 1.0 SITE INFORMATION

The 0.148 hectare site is known municipally as 75 Dublin Street North in the City of Guelph. The site is bound by existing institutional development (Central Public School) to the north, existing commercial development to the east, Cork Street West to the south and Dublin Street North to the west. The site currently consists of three tennis courts and landscaped areas.

The intent of the Owner at this time is to construct a 5 storey apartment building consisting of 35 units (including 20 affordable units) and the associated underground parking and landscaped areas.

Following re-development of the site, runoff generated from the site will be attenuated on-site, ultimately discharging to the existing 200mm diameter storm sewer service lateral terminated at property line along Cork Street West frontage.

## 2.0 PROPOSED DEVELOPMENT

### 2.1 Site Grading

The proposed grade and elevations of the site, along with the parking garage elevations are controlled by the existing centre line road elevation on Cork Street West and Dublin Street North. The site will be graded to match the existing elevations along the property limits.

### 2.2 Water Supply

Water service for the proposed development at 75 Dublin Street North will be provided via a connection to the 150mm diameter water service lateral currently terminated at property line along the Cork Street West frontage. In their Memo (dated November 3, 2016), the City has identified that the proposed development will have no significant adverse impact to the City's water supply and distribution system.

## 2.3 Sanitary Sewers

Sanitary service for the proposed development at 75 Dublin Street North will be provided by the existing 150mm sanitary sewer service lateral currently terminated at property line along the Cork Street West frontage. The City has identified that the proposed development will have no significant adverse impact to the downstream sanitary sewers (City of Guelph Memo dated November 3, 2016).

Preliminary sanitary sewer design calculations for 75 Dublin Street North have been included in Appendix 'A'.

## 2.4 Storm Sewers

Storm service for the proposed development at 75 Dublin Street North will be provided by the existing 200mm storm sewer service lateral currently terminated at property line along the Cork Street West frontage.

Preliminary storm sewer design calculations for 75 Dublin Street North have been included in Appendix 'A'.

## 2.5 Stormwater Management

The stormwater management criteria established by the City of Guelph are as follows:

1. The allowable release rate for the site is  $0.023\text{m}^3/\text{s}$  for the City of Guelph 5-Year Design Storm.
2. Major storms are to be routed overland to the City's R.O.W. without exceeding a maximum parking lot pond depth of 0.30m. Sites which cannot meet these criteria are required to provide storage on the site for twice the five year design storm runoff volume.
3. The minimum acceptable water quality level for discharge to the municipal collection system is 70% TSS removal.
4. Existing overland drainage patterns from adjoining properties must be maintained and shown on the submitted drawing.

The hydrologic model MIDUSS was used to create runoff hydrographs for the site for 5 and 100-year design storms. The City of Guelph Chicago Rainfall Distribution parameters were used to generate the 5 and 100-year design events. The parameters are as follows:

**Table No. 1: City of Guelph Chicago Storm Parameters**

	<b>5-Year</b>	<b>100-Year</b>
a =	1593.0	4688.0
b =	11.0	17.0
c =	0.879	0.962
r =	0.400	0.400
td =	170	210
Rainfall Depth (mm) =	46.775	88.830

The Horton infiltration method was used for the runoff calculations. The infiltration parameters used in the MIDUSS modelling are as follows:

**Table No. 2: Horton Infiltration Parameters**

	<b>Impervious Areas</b>	<b>Pervious Areas</b>
Maximum Infiltration	0.00 mm/hr	75.00 mm/hr
Minimum Infiltration	0.00 mm/hr	12.50 mm/hr
Lag Constant	0.00 hr	0.25 hr
Depression Storage	1.50 mm	5.00 mm

### 2.5.1 Post-Development Condition

**Catchment 100 (0.098-hectares, 100% Impervious)** represents the roof top of the proposed apartment building. Since the rooftop of the proposed building is flat, and roof drains are provided under the Ontario Building Code, natural storage and attenuation of stormwater will occur. To recreate the natural storage and attenuation of stormwater on the roof of the proposed building, runoff from Catchment 100 will be naturally attenuated through the use of three (3) roof drains with six (6) weirs per drain, based on the assumption that there is a roof drain for every 464.5m<sup>2</sup> (5,000 ft<sup>2</sup>) of rooftop area and that the average depth of water stored on the rooftop will not exceed the design criteria of 100 mm, with a maximum storage depth of 150 mm at the roof drains. Please note a roof drain with six (6) weirs represents a standard, fully open roof drain with no flow control features. Under post-development conditions, the roof drains will discharge to the on-site storm sewers, and ultimately the existing 200mm storm sewer service lateral currently terminated at property line along the Cork Street West frontage.

As roof top runoff is considered 'clean' runoff, quality control treatment for runoff generated by Catchment 100 is not required.

**Catchment 200 (0.050-hectares, 20% Impervious)** represents the remainder of the site, including the asphalt driving area, walkways and landscaped areas. Under post-development conditions, runoff generated from Catchment 200 will sheetflow overland uncontrolled.

Quality control for runoff generated from Catchment 200 will be provided by directing runoff over grassed surfaces prior to discharge from the site.

The post-development flow rate from the site during the 5 and 100 year design storms are as follows:

**Table No. 3: Post-Development Condition Flow Rates**

	<b>5-Year</b>	<b>100-Year</b>
Catchment 100	0.007 m <sup>3</sup> /s	0.013 m <sup>3</sup> /s
Catchment 200	0.006 m <sup>3</sup> /s	0.021 m <sup>3</sup> /s
<b>Total</b>	<b>0.013 m<sup>3</sup>/s</b>	<b>0.031 m<sup>3</sup>/s</b>

A comparison of the allowable release rate and the post-development flow rate from the site during the 5 and 100 year design storms is as follows:

**Table No. 4: Comparison of Allowable Release Rate and Post-Development Flow Rate**

	<b>5-Year</b>	<b>100-Year</b>
Allowable Release Rate	0.023 m <sup>3</sup> /s	---
Post-Development Flow Rate	0.013 m <sup>3</sup> /s	0.031 m <sup>3</sup> /s

Therefore, the post-development flow rate from the site during the 5-year design storm has been attenuated to be less than the allowable release rate for the 5-year design storm.

### 3.0 SEDIMENT AND EROSION CONTROL

Silt fence will be installed along the construction boundary in all locations where runoff will discharge from the site to adjacent lands. The silt fence will serve to minimize the opportunity for waterborne sediments to be washed onto the adjacent properties.

Upon completion of the grading, any area not subject to active construction within 30 days will be topsoiled and hydroseeded as per OPSS 572.

Once catch basins have been installed, the grates will be wrapped in filter cloth. This feature will be maintained until all building and landscaping has been completed.

Inspection and maintenance of all silt fencing will start after installation is complete. The silt fence will be inspected on a weekly basis during active construction or after a rainfall event of 13mm or greater. Maintenance will be carried out, within 48 hours, on any part of the silt fence found to need repair.

Once construction and landscaping has been substantially completed, the silt fence will be removed, any accumulated sediment will be removed and the landscaping will be completed.

After construction of the complete development, erosion will not occur and sediment transport will be minimal.

#### 4.0 SUMMARY

In summary, the features of the design for the proposed development are as follows:

1. Water service for the proposed development at 75 Dublin Street North will be provided via the existing 150mm diameter water service lateral currently terminated at property line along the Cork Street West frontage.
2. Sanitary service for the proposed development at 75 Dublin Street North will be provided via the existing 150mm sanitary sewer service lateral currently terminated at property line along the Cork Street West frontage.
3. Storm service for the proposed development at 75 Dublin Street North will be provided via the existing 200mm storm sewer service lateral currently terminated at property line along the Cork Street West frontage.
4. Post-development runoff from the site has been attenuated to less than the allowable release rate for the 5-year design storm event.
5. Quality control treatment for runoff generated from the site will be achieved by directing runoff over grassed surfaces prior to discharge from the site.

All of which is respectfully submitted.

Yours truly,

**GM BLUEPLAN ENGINEERING LIMITED**

Per:

A handwritten signature in blue ink, appearing to read 'Angela Kroetsch'.

Angela Kroetsch, P.Eng.  
AK/pw

**APPENDIX A:  
SANITARY & STORM SEWER DESIGN CALCULATIONS**

PROJECT: 75 Dublin Street North  
City of Guelph

DATE: August 23, 2017  
DESIGNED BY: P.W.  
CHECKED BY: A.E.K.

# SANITARY SEWER DESIGN

## City of Guelph

Sheet 1 of 1

Residential: 0.0010 m<sup>3</sup>/s/ha  
Commercial & Industrial: 0.0017 m<sup>3</sup>/s/ha  
Schools & Multi Family: 0.0025 m<sup>3</sup>/s/ha  
Apartments - 150 u.p./ha: 0.0060 m<sup>3</sup>/s/ha  
Apartments - 250 u.p./ha: 0.007 m<sup>3</sup>/s/ha  
High Density Apartments 0.007 m<sup>3</sup>/s/ha

Average Daily Flow  
Per Person = 350 L/p/d  
Minimum Full Velocity = 0.75 m/s  
Max Peak Fac. = 4.272  
Min Peak Fac. = 3.736

Manning Equation:  $Full\ Cap. = (D/2/1000)^{2.487} \cdot P^{1.487} \cdot (1/n)^{2.487} \cdot (S/100)^{0.5}$

$D = \text{Diameter (mm)}$

$S = \text{Slope (\%)}$

$n = 0.013$  (PVC & Concrete), 0.016 (Vitrified Clay)

$Q(i) = \text{Cum. Area (ha)} \cdot \text{Infiltration Rate / 1000}$

$\text{Infiltration Rate} = 0.15 \text{ L/ha/s}$

$\text{Peaking Factor} : F = 1 + (14/(4+P^{0.5}))$

$P = \text{Population/1000}$

10 Wilson Street	From M.H.	To M.H.	RESIDENTIAL AREA AND POPULATION						Commercial & Industrial				Schools & Multi Family			Apartments		C+S+A		Peak Extraneous Flow Q(i) = (m <sup>3</sup> /s)	Total Flow (m <sup>3</sup> /s)	Pipe					
			Area (ha)	Proposed Density (p/ha)	Population		Peak Flow (m <sup>3</sup> /s)	Peak Factor	Area (ha)	Cum. Area (ha)	Area (ha)	Cum. Area (ha)	Area (ha)	Cum. Area (ha)	Area (ha)	Cum. Area (ha)	Area (ha)	Cum. Area (ha)	Peak Flow (m <sup>3</sup> /s)			Peak Flow (m <sup>3</sup> /s)	Distance (m)	Diameter (mm)	Slope (%)	Capacity (Full) (m <sup>3</sup> /s)	Velocity (m/s)
					Area (ha)	Population																					
Proposed Garage	STUB	MH.B																		1.7	150	0.50	0.0108	0.611	0.391		
	MH.B	MH.A																		26.4	150	0.50	0.0108	0.611	0.391		
	MH.A	EX.MH																		10.6	150	2.00	0.0215	1.217	0.694		
	EX.MH	EX.MH																		70.2	200	10.72	0.1074	3.419	1.128		

PROJECT: 75 Dublin Street North  
City of Guelph

# STORM SEWER DESIGN

Chicago Storm Parameters (5-Year)

A = 1593

B = 11

C = 0.879

Intensity =  $A / (t + B) ^ C$

DATE: August 23, 2017

DESIGNED BY: P.W.

CHECKED BY: A.E.K.

City of Guelph

Sheet 1 of 1

Reach No.	Location		Area (ha)	Runoff Coefficient	A x C	Cumulative A x C	TC (min.)	Intensity (mm/hr)	Flow (m <sup>3</sup> /s)	Proposed Sewer						
	Street	From								To	Length (m)	Pipe Size (mm)	Type of Pipe	Grade %	Capacity (m <sup>3</sup> /s)	Full Flow Velocity (m/s)
	Building	STUB	0.098	0.75	0.07	0.07	10.00	109.64	0.007	4.4	200	0.013	1.00	0.03	1.04	0.07
		CB-4	0.021	0.75	0.02	0.02	10.00	109.64	0.005	32.3	200	0.013	0.50	0.02	0.74	0.73
		CBMH.3	0.008	0.75	0.01	0.02	10.73	106.40	0.006	9.3	200	0.013	0.50	0.02	0.74	0.21
		MH.2	0.000	0.75	0.00	0.10	10.94	105.51	0.028	9.8	200	0.013	2.00	0.05	1.48	0.11

Note: Peak flow from Stub to MH.2 is based on controlled roof top flow rate.

Date: August 22, 2017

Project: 75 Dublin Street North

Designed By: P.W.

Revised By:

416115

Checked By: A.E.K.