



July 30, 2020
Our File: 415084

City of Waterloo
Engineering Services Division
Waterloo City Centre
100 Regina Street South
Waterloo, ON N2J 4A8

Attention: Ms. Ronda Werner, C.E.T.

Re: 145 Columbia Street West
City of Waterloo
Functional Servicing Letter

Dear Ms. Werner,

The following letter outlines the functional servicing analysis required to support the Site Plan Approval and Zoning Amendment Applications for the proposed 20 and 23 storey apartment building located at 145 Columbia Street West in the City of Waterloo.

WATER SUPPLY

Water supply for the proposed development will be provided via the extension of a 200 mm diameter watermain from the existing 300 mm diameter watermain on Columbia Street West. As part of the development at 145 Columbia Street, the existing fire hydrant across the frontage of the site will be relocated and an additional fire hydrant will be provided at the southeast corner of the Columbia Street West and Phillip Street intersection. As per the City’s water services requirements, domestic water and fire service will split within the building and the domestic supply will to be metered within 2m from its point of entrance into the building.

The unit rate and peaking factors of water consumption, minimum pipe size and allowable pressure were established based on the Region of Waterloo Design Guidelines and Supplemental Specifications.

The water demands for the site are as follows:

Table 1: Anticipated Water Demands

	Anticipated Water Demand
Average Day Domestic Demand 541 persons (1,163 beds/ha x 0.4651ha x 1 p/bed) at 225 L/cap/d	1.41 L/s
Average Day Commercial/Retail Demand	0.15 L/s
Total Average Day Demand	1.56 L/s
Peak Day Demand (3 x Average Day Demand)	4.68 L/s
Peak Hour Demand (4.5 x Average Day Demand)	7.02 L/s

The pressures and volumes must be sufficient for Peak hour conditions and under fire conditions as established by the Ontario Building Code. The MECP minimal residual pressure under fire conditions is 140 kPa (20.3 psi).

According to the MECP criteria and the data provided by the Region of Waterloo the allowable and available pressures are as follows:

	Allowable Pressures (kPa)		Available Pressures (kPa)
	Min.	Max.	
1) Min. Hour	275	700	436
2) Average Day	350	550	404
3) Peak Day	350	550	392
4) Peak Hour	275	700	353

There is one main supply point for the site, which is the 300 mm diameter watermain on the south side of the Columbia Street right-of-way.

The extension of a 200 mm diameter watermain from the existing 300 mm diameter watermain on Columbia Street will provide water service to the proposed development. The Mechanical Engineer for this development has verified that the proposed 200mm diameter water service is sufficient for the building's requirements.

The water service sizing for the proposed 20 and 23 storey development does not require any upgrades from the previous servicing design for the 15 and 20 storey tower development as identified in GM BluePlan Engineering Drawings No. 1 thru 9, dated 07/24/2020).

SANITARY SERVICING

The extension of a 250 mm diameter sanitary sewer from the existing 250 mm diameter sanitary sewer on Columbia Street West will provide sanitary service to the proposed development. Sanitary sewer design calculations identifying the peak sanitary sewer flows generated from the development at 145 Columbia Street West.

The sanitary service sizing for the proposed 20 and 23 storey development does not require any upgrades from the previous servicing design for the 15 and 20 storey tower development as identified in GM BluePlan Engineering Drawings No. 1 thru 9, dated 07/24/2020).

STORM SERVICING

Storm service for the proposed development will be provided by the extension of a 300 mm diameter storm sewer service from the existing 825 mm diameter storm sewer on Columbia Street West. On-site storm sewers will be sized to convey the 5-year design storm event. Major storm runoff from the site will be conveyed within the limits of the site, discharging to the Columbia Street West right-of-way.

The storm service sizing for the proposed 20 and 23 storey development does not require any upgrades from the previous servicing design for the 15 and 20 storey tower development as identified in GM BluePlan Engineering Drawings No. 1 thru 9, dated 07/24/2020).

We trust this is the information you require at this time. If you have any questions or require additional information, please do not hesitate to call.

Yours truly,

GM BLUEPLAN ENGINEERING LIMITED

Per:



Angela Kroetsch, P.Eng.

AK/rdj

Encl.

PROJECT: 145 Columbia Street West
City of Waterloo

SANITARY SEWER DESIGN

City of Waterloo

Residential: 0.35 m³/c/d
Commercial: 0.00060 m³/s/ha
Industrial: 0.00050 m³/s/ha
Institutional: 0.00010 m³/student/d
Commercial Peaking Factor = 2.5

DATE: July 30, 2020
DESIGNED BY: R.DJ.
CHECKED BY: A.E.K.

Sheet 1 of 1

Q(i) = Cumm. Area (ha) * Infiltration Rate / 1000 Manning Equation: Full Cap.= (D/2/1000)²*Pi*(D/4/1000)^{0.667}*(1/n)*(S/100)^{0.5} Average Daily Flow n = 0.013
Infiltration Rate: 0.15 L/ha/s D = Diameter (mm) Per Person = 350 L/p/d Max Peak Fac. = 4.272
S = Slope (%) Minimum Full Velocity= 0.75 m/s Min Peak Fac. = 3.736
Peaking Factor : F = 1 + (14/(4+P^{0.5})) P = Population/1000 n = 0.013 (PVC & Concrete), 0.016 (Vitrified Clay)

Flows from MH.16245 to MH.10131 and MH.10131 to MH.10816 obtained from City of Waterloo Sanitary Servicing Master Plan, 2029 - 10-yr storm model output

145 Columbia Street West	From M.H.	To M.H.	RESIDENTIAL AREA AND POPULATION							Commercial		Industrial		Institutional		C+I	Peak Extraneous Flow Q(i) = (m ³ /s)	Total Flow (m ³ /s)	Pipe					
			Area (ha)	Proposed Density (p/ha)	Population	Cumulative		Peak Factor	Peak Flow (m ³ /s)	Area (ha)	Cum. Area (ha)	Area (ha)	Cum. Area (ha)	Area (ha)	Cum. Area (ha)	Peak Flow (m ³ /s)			Distance (m)	Diameter (mm)	Slope (%)	Capacity (Full) (m ³ /s)	Velocity	
						Area (ha)	Population										Full (m/s)	Actual (m/s)						
	MH.16245	MH.A	0	0	0	0.00	0	4.500	0.0110	0.0	0.0	0.0	0.0	0.0	0.0	0.00000	0.000000	0.0110	59.4	250	0.722	0.0505	1.029	0.813
Proposed Building	PLUG	MH.B	0.465	1163	541	0.47	541	3.956	0.0087	0.0	0.0	0.0	0.0	0.0	0.0	0.00000	0.000070	0.0087	6.2	300	1.00	0.0967	1.368	0.862
	MH.B	MH.A	0	0	0	0.47	540.80	3.956	0.0087	0.0	0.0	0.0	0.0	0.0	0.0	0.00000	0.000070	0.0087	17.0	250	2.00	0.0841	1.713	1.096
	MH.A	MH.10131	0	0	0	0.00	541	3.956	0.0000	0.0	0.0	0.0	0.0	0.0	0.0	0.00000	0.000000	0.0197	10.0	250	1.50	0.0728	1.483	1.275
	MH.10131	MH.10816	0	0	0	0.00	541	3.956	0.0000	0.0	0.0	0.0	0.0	0.0	0.0	0.00000	0.000000	0.0197	96.6	250	1.24	0.0662	1.349	1.187