

File 121036

April 23, 2024

Beckett Frisch
Community Planner
Town of Collingwood
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Re: 140 Mountain Road, Manorwood Commercial, Town of Collingwood
Addendum No.1 - Functional Servicing Report Phase 1 Water Demands

Dear Beckett:

We are pleased to provide the following Addendum No. 1 to the Functional Servicing Report (FSR) dated October 17, 2023 for 140 Mountain Road in response to your emails dated April 19 and 22, 2024 as follows:

3 SANITARY SERVICING

3.1 Existing Sanitary Sewage System

The existing sanitary sewer system was confirmed through the review the *Town of Collingwood MSP, 2019*, by Cole Engineering and the *Preliminary Servicing Report for Mair Mills Estates, 1999*, the *Preliminary Servicing Report for Mair Mills Village, 2006*, and the *Functional Servicing Report for Side Launch Brewery, 2012* all of which were prepared by Tatham. The sanitary sewer design sheets prepared by Tatham for the above-mentioned studies have been used as the basis for assessing the available sewer capacity.

An existing 375 mm diameter sewer is located along Mountain Road across the frontage of the property and is upsized to 500 mm diameter approximately 360m east of the site at Ex. SAN MH 7 as shown in Appendix A on the Mair Mills Sanitary Servicing Plan. Tatham has completed depth measurements at the various maintenance holes accessible along Mountain Road and confirmed it is at sufficient depth for the proposed development.

The proposed development will connect between Ex. SAN MH 6 and Ex. SAN MH 7 located at the northeast property corner in front of the site on Mountain Road, as shown on the Site Servicing Plan (SS-1) in the Engineering Drawings submitted for Site Plan Approval. The 375 mm diameter section of trunk sewer along Mountain Road between SAN MH 6 and SAN MH 7 has a length of 123.9 m, a slope of 0.59% and a full flow capacity 134.66 L/s. The average flow in this section, including flow from the proposed development, has been determined to be 39.00 L/s with a peak flow of 67.28 L/s.

The composite slope in the 500 mm diameter sanitary trunk sewer located approximately 70 m downstream of the proposed connection point along Mountain Road between Ex. SAN MH 8 and Ex. SAN MH H26N-31 (shown in Appendix A, Mair Mills Sanitary Servicing Plan) at the intersection of Mountain Road & Highway 26, is 0.14 %, the full flow capacity of this section is 141.29 L/s.

3.2 Proposed Sanitary Sewage System

The proposed development **will be divided into two phases both of which** will be serviced by a single 200 mm diameter sanitary service connected to the existing 375 mm sanitary sewer on Mountain Road trunk sewer located between EX. SAN MH 5 and EX. SAN MH 6. The proposed sanitary servicing is illustrated on the Site Servicing Plan (drawing SS-1) included in the Site Plan application package.

3.3 Sewage Demands and Capacity

To determine the sewage design flows from the development area, an average daily demand rate for light industrial/commercial land use of 28.0 m³/ha/day is estimated based on the Ministry of Environment, Conservation and Parks (MECP), *Design Criteria for Sanitary Sewers and Force mains for Alterations Authorized under Environmental Compliance Approval (V.1.1, dated July 28, 2022)*. Based on our experience with similar developments of this nature this is an overly conservative considering the small scale of the development and the light industrial/commercial use being proposed.

Using Town flow rates, the average day and maximum day flows for Phase 1 and Phase 2 of the development area were calculated as follows:

Phase	Average Day (L/s)	Maximum Day (L/s)
1	0.56	1.59
1 & 2	1.12	3.11

Detailed sewage design flow calculations for the subject property are included in Appendix A.

It is our understanding that the Town maintains its own up to date sanitary flow conveyance model of this area, we expect this model will confirm reserve capacity is available in the downstream system through the development review process.



4 WATER SUPPLY & DISTRIBUTION

4.1 Existing Water Servicing

An existing 300 mm diameter watermain is located along the south side of Mountain Road, complete with one accessible fire hydrant located at the northwest property corner of the proposed development.

4.2 Proposed Water Servicing

A 200 mm diameter watermain will be connected to the existing 300 mm diameter watermain on Mountain Road to service the site for both domestic and fire flows. The proposed water main will enter the buildings mechanical / electrical room where a backflow prevention device and water meter will be installed prior to any service connections per Town standards.

The proposed watermain size will be verified following detailed building designs by the architect and mechanical engineer. A fire hydrant is located at the northwest property corner on Mountain Road and building will be sprinkled throughout to provide sufficient fire protection per Town standards.

4.3 Water Demands

To determine the water demands for the subject property, a conservative average daily demand rate for light industrial land use of 35.0 m³/ha/day is estimated based on the expected uses of the building. **The proposed building will be divided into two (2) phases both of which will consist of 18 units for a total of 36 units. Both phases of the building will be constructed of non-combustible material and will be sprinklered. Fire Underwriters Survey (FUS) fire flow calculations (included in Appendix B) determined the maximum required fire flow for Phase 1 and Phase 2 of the development to be 83 L/s and 119 L/s, however, the minimum fire flow required by the Town's Development Standards for an industrial/commercial subdivision is 136 L/s. Therefore, the water demands are as follows:**

Phase	Average Day (L/s)	Maximum Day plus Fire (L/s)
1	0.41	136
1 & 2	0.82	136

Detailed demand calculations for both phases are included in Appendix B for reference. We understand the proposed watermain system will be added to the Town-wide model for confirmation of watermain sizes.



The subject property is located in Pressure Zone 1 and therefore no external upgrades are anticipated as peak water use for the development is relatively low.

Yours truly,

Tatham Engineering Limited



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KRS:rlh

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**Appendix A:
Sanitary Servicing Analysis**



Demand Rate - Light Industrial = 28.0 m³/ha/day (Phase 1 Gross ha site area = 1.01 ha)
 = 0.32 L/ha/s

Infiltration Flow (I) = Infiltration Flow x Drainage Area
 = 0.23 L/s/ha x **1.01** ha 0.23 L/s/ha Town Standard
 = 0.23 L/s

Average Day Flow (ADF) = Site Area x Demand Rate + I
 = **1.01** ha x 0.32 L/ha/s + 0.23 L/s
 = 0.33 L/s + 0.23 L/s
 = 0.56 L/s

Equivalent Population (P) = ADF - I / Avg Flow per Capita
 = 0.56 L/s / 0.00301 L/cap/s 260 L/cap/d as per
 = 186 cap Town Standards
 August 2022 Update

Harmon Peaking Factor (PF) = $1 + \frac{14}{4 + (P/1000)^{0.5}}$
 = 4.16

Maximum Day Flow (MDF) = (ADF - I) x PF + I
 = 0.33 x 4.16 + 0.23
 = 1.59 L/s

Demand Rate - Light Industrial = 28.0 m³/ha/day (Gross ha site area)
 = 0.32 L/ha/s

Infiltration Flow (I) = Infiltration Flow x Drainage Area
 = 0.23 L/s/ha x 2.02 ha 0.23 L/s/ha Town Standard
 = 0.46 L/s

Average Day Flow (ADF) = Site Area x Demand Rate + I
 = 2.02 ha x 0.32 L/ha/s + 0.46 L/s
 = 0.65 L/s + 0.46 L/s
 = 1.12 L/s

Equivalent Population (P) = ADF - I / Avg Flow per Capita
 = 1.12 L/s / 0.00301 L/cap/s 260 L/cap/d as per
 = 372 cap Town Standards
 August 2022 Update

Harmon Peaking Factor (PF) = $1 + \frac{14}{4 + (P/1000)^{0.5}}$
 = 4.04

Maximum Day Flow (MDF) = (ADF - I) x PF + I
 = 0.65 x 4.04 + 0.46
 = 3.11 L/s

Appendix B: Water Demand Calculations





Project: 140 Mountain Road	Date: November 2, 2022
File No.: 121036	Designed: MR
Subject: Phase 1 Fire Flow Demand Calculations	Checked: KRS
Revisions: April 23, 2024	

Calculation Based on 2020 Publication "Water Supply for Public Fire Protection" by Fire Underwriters Survey (FUS).

Step	Description	Term	Options	Multiplier Associated with Option	Choose	Value used	Unit	Total Fire Flow (L/min)		
1	Frame Use for Construction of Unit	Coefficient related to type of construction (C)	Framing Material						N/A	
			Wood Frame	1.5	Non-combustible construction	0.8	-			
			Ordinary Construction	1						
			Non-combustible construction	0.8						
			Fire resistive construction (< 2 hrs)	0.7						
Fire resistive construction (> 2 hrs)	0.6									
2	Type of Housing (if Townhouse, enter number of units per TH block)	Type of Housing	Floor Space Area						N/A	
			Single Family	1		0	Units			
			Townhouse / Apartment- inform # of units	1		0				
			Other (Comm, Ind., etc.)	1		1				
	2 hour Fire Separation Between Units	1	No	0						
2.1	Number of Storeys	Number of Floors / Storeys in the unit (do not include basement)					1	Storeys	N/A	
3	Floor Area (exclude basements, per unit for townhouses, per single family dwelling or per building for apartments, commercial or institutional)	Ground Floor Area (assume fire stop separation is being provided per unit)						0	N/A	
		Total Floor Area - One Storey of Townhouse/Apartment Block						0		
		Total Floor Area - All Storeys						3237		
		Does the building have fire-resistive design?						No		3237
		Are vertical openings/communications properly protected (1 hour rating)?						No		3237
		Total Floor Area (A) - for all storeys excluding basement - Single Family						3237		
		Measurement Units								
			Square Feet (ft ²)	0,093						
			Square Metres (m ²)	1		3237	m ²			
			Hectares (ha)	10000						
4	Required Fire Flow without Reductions or Increases	Required Fire Flows without Reductions or Increases per FUS: (FF= 220 x C x A ^{0.5})							L/min	10,000
5	Factors Affecting Burning	Reductions / Increases Due to Factors Affecting Burning								
5.1	Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Non-combustible	-0.25	N/A	(2,500)	7,500	
			Limited combustible	-0.15						
			Combustible	0.00						
			Free burning	0.15						
			Rapid burning	0.25						
5.2	Reduction Due to Presence of Sprinklers	Sprinkler reduction	Fully supervised system	-0.5	Automatic sprinkler protection	-0.3	N/A	(2,250)	5,250	
			Water supply system/hose connections	-0.4						
			Automatic sprinkler protection	-0.3						
			None	0						
5.3	Separation Distance Between Units (Use 10% for 2 hour Fire Separation between adjacent units)	Exposure distance between units	North Side	30.1 to 45.0 m	0.00	0	%		5,250	
			East Side	30.1 to 45.0 m	0.00					
			South Side	Greater than 45.0 m	0.00					
			West Side	30.1 to 45.0 m	0.00					
Total Required Fire Flow, rounded to nearest 1000 L/min, with max/min limits applied:									5,000	
6	Required Fire Flow, Duration and Volume	Total Required Fire Flow (above) in L/s:						83		
		Required Duration of Fire Flow of 5,000 L/min (hrs):						2		
		Required volume for Fire Flow of 5,000 L/min (m ³):						600		



Project: 140 Mountain Road	Date: November 2, 2022
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Subject: Fire Flow Demand Calculations	Checked: KRS
Revisions:	

Calculation Based on 2020 Publication "Water Supply for Public Fire Protection" by Fire Underwriters Survey (FUS).

Step	Description	Term	Options	Multiplier Associated with Option	Choose	Value used	Unit	Total Fire Flow (L/min)		
1	Frame Use for Construction of Unit	Coefficient related to type of construction (C)	Framing Material						N/A	
			Wood Frame	1.5	Non-combustible construction	0.8				
			Ordinary Construction	1						
			Non-combustible construction	0.8						
			Fire resistive construction (< 2 hrs)	0.7						
Fire resistive construction (> 2 hrs)	0.6									
2	Type of Housing (if Townhouse, enter number of units per TH block)	Type of Housing	Floor Space Area						N/A	
			Single Family	1		0	Units			
			Townhouse / Apartment- inform # of units	1		0				
			Other (Comm, Ind., etc.)	1		1				
	2 hour Fire Separation Between Units	1	No	0						
2.1	Number of Storeys	Number of Floors / Storeys in the unit (do not include basement)					1	Storeys	N/A	
3	Floor Area (exclude basements, per unit for townhouses, per single family dwelling or per building for apartments, commercial or institutional)	Ground Floor Area (assume fire stop separation is being provided per unit)						0	N/A	
		Total Floor Area - One Storey of Townhouse/Apartment Block						0		
		Total Floor Area - All Storeys						6474		
		Does the building have fire-resistive design?						No		6474
		Are vertical openings/communications properly protected (1 hour rating)?						No		6474
		Total Floor Area (A) - for all storeys excluding basement - Single Family						6474		
		Measurement Units								6474
			Square Feet (ft ²)	0.093						
			Square Metres (m ²)	1						
			Hectares (ha)	10000						
4	Required Fire Flow without Reductions or Increases	Required Fire Flows without Reductions or Increases per FUS: (FF= 220 x C x A ^{0.5})						L/min	14,000	
5	Factors Affecting Burning	Reductions / Increases Due to Factors Affecting Burning								
5.1	Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Non-combustible	-0.25	N/A	(3,500)	10,500	
			Limited combustible	-0.15						
			Combustible	0.00						
			Free burning	0.15						
			Rapid burning	0.25						
5.2	Reduction Due to Presence of Sprinklers	Sprinkler reduction	Fully supervised system	-0.5	Automatic sprinkler protection	-0.3	N/A	(3,150)	7,350	
			Water supply system/hose connections	-0.4						
			Automatic sprinkler protection	-0.3						
			None	0						
5.3	Separation Distance Between Units (Use 10% for 2 hour Fire Separation between adjacent units)	Exposure distance between units	North Side	30.1 to 45.0 m	0.00	0	%		7,350	
			East Side	30.1 to 45.0 m	0.00					
			South Side	Greater than 45.0 m	0.00					
			West Side	30.1 to 45.0 m	0.00					
Total Required Fire Flow, rounded to nearest 1000 L/min, with max/min limits applied:									7,000	
6	Required Fire Flow, Duration and Volume	Total Required Fire Flow (above) in L/s:							117	
		Required Duration of Fire Flow of 7,000 L/min (hrs):							2	
		Required volume for Fire Flow of 7,000 L/min (m ³):							840	

