

File 121036

October 24, 2024

Beckett Frisch
Community Planner
Town of Collingwood
P.O. Box 157, 97 Hurontario Street
Collingwood, Ontario L9Y 3Z5
bfrisch@collingwood.ca

Re: 140 Mountain Road, Manorwood Commercial, Town of Collingwood
Addendum No.2 - Functional Servicing Report Fire Flows

Dear Beckett:

We are pleased to provide the following Addendum No. 2 to the Functional Servicing Report (FSR) dated October 17, 2023 for 140 Mountain Road in response to your email dated October 18, 2024 as follows:

Town Comment:

Since the revised comment regarding insufficient fire flows was issued on October 4, 2024, we have had further internal conversations regarding how this will be reviewed. Please see the below revised comment from the Town regarding insufficient fire flows:

The Town acknowledges receipt of the draft water modelling report dated Thursday, June 20, 2024. Upon review of this report, the Town's fire flow standard of 136 L/s for Industrial/Commercial Subdivisions was not attained. Given this, the current proposed works do not meet the Town's development standards for fire flow. However, the Town is allowing the proposed works to proceed subject to the developer and developer's engineer ensuring all requirements set out in the OBC for supplemental fire systems for the proposed works are met and completed. This will be reviewed by the Town's Building Department through the building permit process. Please be advised that should any revisions be required to the stamped site plan approved drawings to accommodate the design of the required fire protection water supply, a Site Plan Amendment, or other Planning Act applications, may be required.

As a supplemental fire system has not been contemplated thus far for the proposed development, Planning Services requests an addendum to the Fourth Submission which includes a supplemental fire system that your client is satisfied would be compliant with the Ontario Building Code (OBC) prior to progressing a staff report to the Director, Planning, Building and Economic Development for consideration. I note the supplemental fire system will not be reviewed for compliance with the OBC by Building Services until such time as a Building Permit application is submitted. However, should the inclusion of a supplemental fire system have implications on the Site Plan drawings or technical reports that have been reviewed to date (e.g. building footprint, parking/landscaping layout to accommodate water storage, SDUs for servicing capacity, etc.), the revisions to the proposed development will need to be further reviewed against the Town's Zoning By-law, Urban Design Manual, and other applicable policies, as necessary. Should the applicant wish to proceed without providing the requested addendum, the applicant would be doing so at their own risk and the development may be subject to additional future Planning Act applications.

With respect to your question re: inclusion in the major development batch for servicing allocation, Planning Services is targeting advancing a staff report to the November 18/December 2 Committee of the Whole/Council cycle. As such, this servicing allocation report will need to be finalized no later than the week of November 4. The proposed development would require conditional site plan approval prior to being considered for servicing allocation.

I'd like to reiterate that should the subject development not comply with the OBC at any time during the building permit process, and revisions to any approved/stamped site plan drawings are required to accommodate a solution, a Site Plan Amendment or other Planning Act application(s) may be required.

Please let me know how your client would like to proceed.

Tatham Response:

Further to our review of the Town's Hydraulic Analysis of 140 Mountain Road Development (DRAFT) Report dated June 20, 2024, and the subsequent correspondence and with the Town's Water and Planning Departments (Appendix A), we note that Section 3.1.1 advises the Town's existing water distribution system can provide a fire flow of 135 L/s, which satisfies the FUS requirement of 133 L/s, but not the Town's fire flow requirement of 136 L/s (1 L/s deficiency).

Therefore, in order to compensate for the lack of available fire flow, Tatham propose a 7,500 Litre (2,000 gallon) water storage tank (size to be verified during Building Permit Approval process) be installed and connected to the proposed 200 mm diameter water service within the site prior to entering the mechanical / electrical room. The storage tank will act as a backup to meet the Town's fire flow requirements of 136 L/s. Details of the water storage tank can be found on the revised Site Servicing Plan SS-1 dated October 23, 2023, which has been enclosed as part of this submission.

Furthermore, the developer acknowledges the proposed supplemental fire suppression system will not be reviewed for compliance with the OBC by Building Services until such time as a Building Permit Application is submitted and should the inclusion of a supplemental fire system have implications on the Site Plan drawings or technical reports that have been reviewed to date (e.g. building footprint, parking/landscaping layout to accommodate water storage, SDUs for servicing capacity, etc.), the revisions to the proposed development will need to be further reviewed against the Town's Zoning By-law, Urban Design Manual, and other applicable policies, as necessary.



We trust this Addendum No.2 addresses the Town's most recent comments as they relate to fire flows and look forward to the Town's conditional approval followed by servicing allocation in November 2024.

Yours truly,
Tatham Engineering Limited



Kevin Sansom, B.A.Sc., P.Eng.

Senior Engineer

KRS:

copy: Chirs Millsap
Kristine Loft

MVP Holdings
Loft Planning

chrismillsap@mvpholdings.ca
kristine@loftplanning.com

O:\Collingwood\2021 Projects\121036 - 140 Mountain Road\Submissions\9. Subsequent Submission for Fire Flow Oct 18 2024\L - Firsch - Interim Phase 1 Water Demands - Response to Email October 4 2024.docx



Appendix A:

Kevin Sansom

From: Beckett Frisch <bfrisch@collingwood.ca>
Sent: Friday, October 18, 2024 3:06 PM
To: Kristine Loft; Kevin Sansom
Cc: Matt Cameron; Sheldon Hancock; Tammy Hogg
Subject: RE: 140 Mountain Road - Fire Flows Addendum

CAUTION: This email originated from outside of Tatham Engineering or Envision-Tatham. Do not click on links or open attachments unless you know the sender and have verified the sender's email address and know the content is safe.

Good afternoon Kristine & Kevin,

Since the revised comment regarding insufficient fire flows was issued on October 4, 2024, we have had further internal conversations regarding how this will be reviewed. Please see the below revised comment from the Town regarding insufficient fire flows:

The Town acknowledges receipt of the draft water modelling report dated Thursday, June 20, 2024. Upon review of this report, the Town's fire flow standard of 136 L/s for Industrial/Commercial Subdivisions was not attained. Given this, the current proposed works do not meet the Town's development standards for fire flow. However, the Town is allowing the proposed works to proceed subject to the developer and developer's engineer ensuring all requirements set out in the OBC for supplemental fire systems for the proposed works are met and completed. This will be reviewed by the Town's Building Department through the building permit process. Please be advised that should any revisions be required to the stamped site plan approved drawings to accommodate the design of the required fire protection water supply, a Site Plan Amendment, or other *Planning Act* applications, may be required.

As a supplemental fire system has not been contemplated thus far for the proposed development, Planning Services requests an addendum to the Fourth Submission which includes a supplemental fire system that your client is satisfied would be compliant with the Ontario Building Code (OBC) prior to progressing a staff report to the Director, Planning, Building and Economic Development for consideration. I note the supplemental fire system will not be reviewed for compliance with the OBC by Building Services until such time as a Building Permit application is submitted. However, should the inclusion of a supplemental fire system have implications on the Site Plan drawings or technical reports that have been reviewed to date (e.g. building footprint, parking/landscaping layout to accommodate water storage, SDUs for servicing capacity, etc.), the revisions to the proposed development will need to be further reviewed against the Town's Zoning By-law, Urban Design Manual, and other applicable policies, as necessary. Should the applicant wish to proceed without providing the requested addendum, the applicant would be doing so at their own risk and the development may be subject to additional future Planning Act applications.

With respect to your question re: inclusion in the major development batch for servicing allocation, Planning Services is targeting advancing a staff report to the November 18/December 2 Committee of the Whole/Council cycle. As such, this servicing allocation report will need to be finalized no later than the week of November 4. The

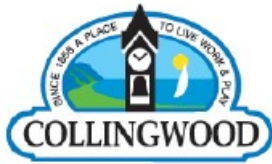
proposed development would require conditional site plan approval prior to being considered for servicing allocation.

I'd like to reiterate that should the subject development not comply with the OBC at any time during the building permit process, and revisions to any approved/stamped site plan drawings are required to accommodate a solution, a Site Plan Amendment or other *Planning Act* application(s) may be required.

Please let me know how your client would like to proceed.

Best,
Beckett

Beckett Frisch (he/him)
Community Planner
705-445-1030 Ext. 3288
www.collingwood.ca



From: Kristine Loft <kristine@loftplanning.com>
Sent: October 15, 2024 10:41 AM
To: Beckett Frisch <bfrisch@collingwood.ca>
Cc: Matt Cameron <mcameron@collingwood.ca>; Kevin Sansom <ksansom@tathameng.com>
Subject: RE: 140 Mountain Road - Fire Flows Addendum

EXTERNAL EMAIL: This email originated outside of the Town's email system. Do not click any links or open any attachments unless you trust the sender and know the content is safe. If in doubt, please contact the helpdesk at x4357.

Beckett,
I just wanted to piggy back on this email string.
Is this file good for moving forward for approvals with the next batch of allocation?

Is there anything you are waiting on from Kevin or I?

Kristine Loft, MCIP RPP

From: Kevin Sansom <ksansom@tathameng.com>
Sent: October 4, 2024 10:37 AM
To: Beckett Frisch <bfrisch@collingwood.ca>
Cc: Kristine Loft <kristine@loftplanning.com>; Matt Cameron <mcameron@collingwood.ca>
Subject: RE: 140 Mountain Road - Fire Flows Addendum

Thanks Beckett. I'll discuss with my client and see how they want to address this and get back to you and Matt.

Matt, I trust I can reach out to you with inquiries to get the water dept. initial reaction to any detailed solutions. Thank you for that in advance.

Have a nice weekend.

Kevin



Kevin Sansom P.Eng.
Senior Engineer

ksansom@tathameng.com T 705-444-2565 x2075 C 705-443-0801
115 Sandford Fleming Drive, Suite 200, Collingwood, Ontario L9Y 5A6

tathameng.com in @ f

This email may contain confidential and/or privileged information for the sole use of the intended recipient. Any review or distribution by others is strictly prohibited. If you have received this email in error, please contact the sender and delete all copies.

Tatham Engineering's agreement to transfer digital documents electronically or otherwise is made under the following conditions: 1. Electronic documents made available by Tatham Engineering are supplied for the recipient's use only under authorization from the current owner and with consent of Tatham Engineering. It is the responsibility of the recipient to determine the accuracy, completeness and the appropriateness of the information provided. 2. It is agreed that only those hard copy documents bearing the professional seal and signature of the Tatham Engineering project engineer will govern the work of the project. In the event of any dispute concerning an electronic document, the appropriately dated hard copy will be the document used by Tatham Engineering to govern and resolve the dispute.

From: Beckett Frisch <bfrisch@collingwood.ca>

Sent: Friday, October 4, 2024 8:49 AM

To: Kevin Sansom <ksansom@tathameng.com>

Cc: Kristine Loft <kristine@loftplanning.com>; Matt Cameron <mcameron@collingwood.ca>

Subject: 140 Mountain Road - Fire Flows Addendum

CAUTION: This email originated from outside of Tatham Engineering or Envision-Tatham. Do not click on links or open attachments unless you know the sender and have verified the sender's email address and know the content is safe.

Good morning Kevin,

Thank you for meeting with the Town last week to discuss potential ways forward for the subject application. As there is no active submission for 140 Mountain Road at this time, please accept the below as an addendum to the fourth submission comments.

The Town acknowledges receipt of the draft water modelling report dated Thursday, June 20, 2024. Upon review of this report, the Town's fire flow standard of 136 L/s for Industrial/Commercial Subdivisions was not attained. Given this, the Town is willing to review alternatives from the developer to make up the shortfall of fire flow, with some factor of safety. Please note that private on-site storage ponds are not acceptable for this purpose, as communicated to the developers engineer. Reasons being reliability of water supply (evaporation, freezing and pump obstruction issues). Until a solution is agreed upon, the proposed development will not be given permission to proceed. Developer to submit alternative solutions for the Towns review.

Please let me know if you have any questions regarding the next steps.

Best,
Beckett

Beckett Frisch (he/him)
Community Planner
705-445-1030 Ext. 3288
www.collingwood.ca



Service Collingwood: Some Town services are available 24/7, please visit service.collingwood.ca to learn more.

Stay Connected! Follow us on social media, sign up for our e-newsletters and agendas to stay informed about municipal matters: [///www.collingwood.ca/stay-connected](http://www.collingwood.ca/stay-connected)

Disclaimer: This transmission may contain information that is subject to or exempt from disclosure pursuant to the Municipal Freedom of Information and Protection of Privacy Act and other applicable law. The information contained in and/or attached to this transmission is intended solely for the intended recipient. If you are not the intended recipient, you are hereby notified that any disclosure, photocopying, distribution, or dissemination of the contents, in whole or in part, is unauthorized and prohibited. If you have received this transmission in error, please notify the sender immediately and destroy all copies.

Service Collingwood: Some Town services are available 24/7, please visit service.collingwood.ca to learn more.

Stay Connected! Follow us on social media, sign up for our e-newsletters and agendas to stay informed about municipal matters: [//www.collingwood.ca/stay-connected](http://www.collingwood.ca/stay-connected)

Disclaimer: This transmission may contain information that is subject to or exempt from disclosure pursuant to the Municipal Freedom of Information and Protection of Privacy Act and other applicable law. The information contained in and/or attached to this transmission is intended solely for the intended recipient. If you are not the intended recipient, you are hereby notified that any disclosure, photocopying, distribution, or dissemination of the contents, in whole or in part, is unauthorized and prohibited. If you have received this transmission in error, please notify the sender immediately and destroy all copies.

Town of Collingwood

Hydraulic Analysis of the 140 Mountain Road Development (DRAFT)

Collingwood Misc. Water Modeling

Thursday, June 20, 2024

C3W-171235

CIMA+

900-101 Frederick Street
Kitchener, ON N2H 6R2
T 519 772-2299 **F** 519 772-2298
cima.ca

Contact

Sam Ziemann, P.Eng.
samuel.ziemann@cima.ca
M 519 404-4529



Engineering for **people**



Hydraulic Analysis of the 140 Mountain Road Development (DRAFT)

Collingwood Misc. Water Modeling

Project no C3W-171235 | File no 75

Prepared by:

Maria Rincon, EIT

Emma Bliss, P.Eng.

Verified by:

Sam Ziemann, P.Eng.

Table of Contents

1	Introduction.....	1
1.1	Limitations.....	2
2	Criteria.....	3
2.1	Town Standards.....	3
2.2	Domestic Demand.....	3
2.3	Fire Flow Demand.....	4
3	Analysis.....	5
3.1	Available Fire Flow.....	5
3.1.1	Pre-Development.....	5
3.1.2	Post Development.....	5
3.2	System Pressures.....	6
4	Conclusions.....	7

List of Tables

Table 2-1: Town of Collingwood Design Standards	3
Table 2-2: Estimated Domestic Demands for the Proposed Development (SLA)	4
Table 3-1: Available Fire Flow (L/s) Under Pre-Development	5
Table 3-2: Available Fire Flow (L/s) Under Post Development.....	6
Table 3-3: Pressure Results (psi) Pre-Development.....	6
Table 3-4: Pressure Results (psi) Post Development.....	6

List of Figures

Figure 1-1: Proposed Development Area (Approximate).....	1
Figure 2-1: Demand Nodes in the Development	4

List of Appendices

Appendix A: Site Plan

Appendix B: Demand and Fire Flow Calculations

1 Introduction

CIMA Canada Inc. (CIMA+) has been requested to conduct a hydraulic assessment of the 140 Mountain Road development and its impact on the existing distribution system. The proposed development is located in pressure Zone 1 in the Town of Collingwood (Town). The development includes the construction of a proposed multi-unit industrial/commercial building and associated parking areas and on-site amenity areas. It will consist of one multi-unit building potentially containing 36 individual units with a total floor area of 6,475 m².

There is an existing 300 mm watermain on Mountain Road. A 200 mm service connection will be connected to the existing 300 mm watermain to service the site. An existing fire hydrant is located near the northwest property corner on Mountain Road and the building will have sprinklers to provide fire protection. Figure 1-1 illustrates the site and a concept plan is available in Appendix A.

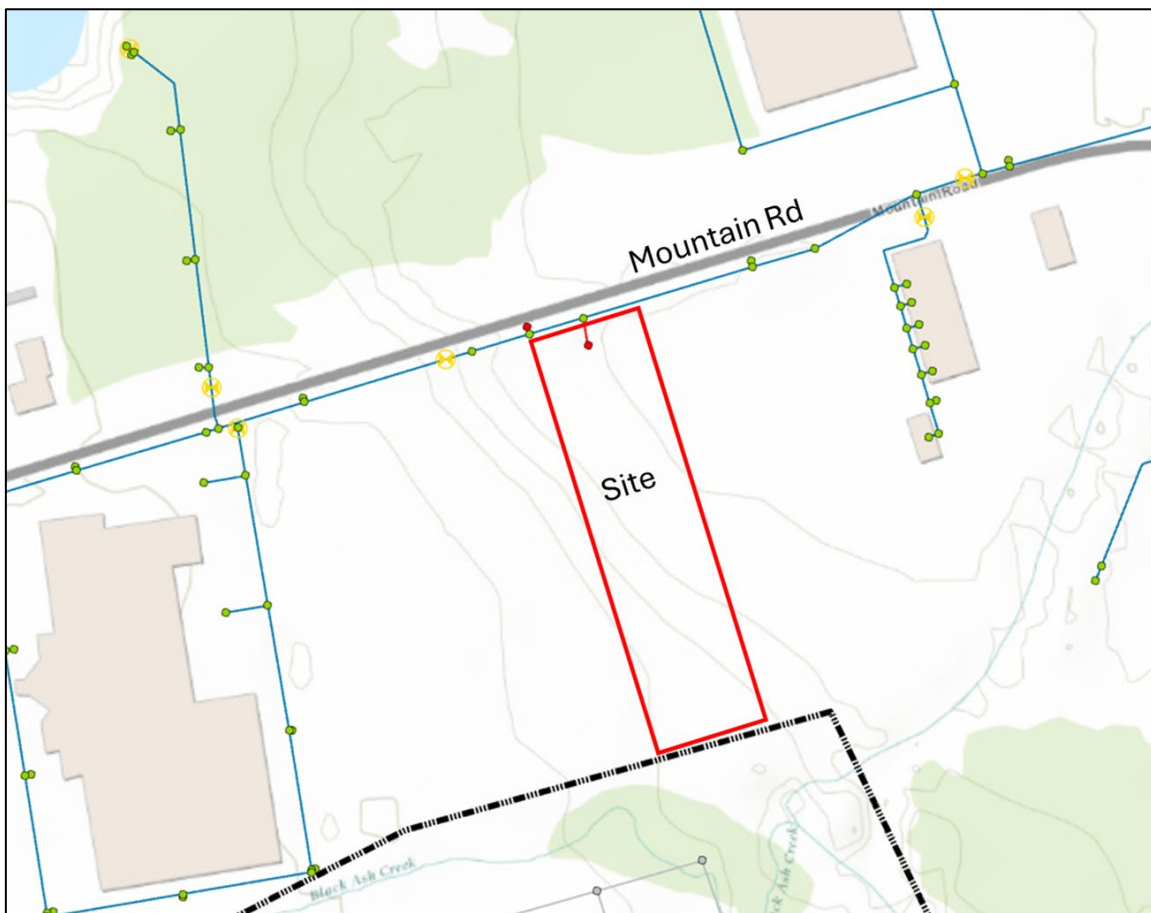


Figure 1-1: Proposed Development Area (Approximate)

The proposed development area was assessed with the Town's InfoWater model using the existing (2020) scenario. In the near future, the Carmichael Pumping Station (PS) is expected to be upgraded with variable frequency drives (VFDs) on the pumps and a new inlet configuration that allows water to be pumped to only the west part of Zone 1 under normal conditions, creating a new Zone 1 West. The proposed development will remain in pressure Zone 1 West once the Carmichael PS upgrades have been completed. The design for this station is currently underway. This upgrade is expected to improve fire flow and pressure conditions, so the existing 2020 scenario was used as a baseline, and future scenario modelling was completed to demonstrate changes to fire flow results.

A pressure control valve has also been proposed at the future connection of Tenth Line and Mountain Rd as part of the Panorama development and as identified in the Master Plan. This upgrade would improve fire flow to Zone 1 Mountain Rd under high demand conditions. It was also included in the near future scenario modelling.

1.1 Limitations

This TM is intended to provide servicing results for the proposed development based on the Town's hydraulic water model. This water model was updated and validated by C3 Water Inc. (now CIMA+) in 2021. As with any modelling assignment, limitations related to the state of the model, the software capabilities, and theoretical data inputs should be considered. The model software also has inherent limitations and assumptions related to the calculation engine and inputs.

2 Criteria

2.1 Town Standards

The Town of Collingwood Development Standards (Town Standards) provide design criteria for assessing the impact of proposed developments. The Town Standards recommend that watermains be designed to provide maximum day demands plus fire flows according to the land use type. The Town Standards also outline minimum pressure requirements, as shown in Table 2-1.

Table 2-1: Town of Collingwood Design Standards

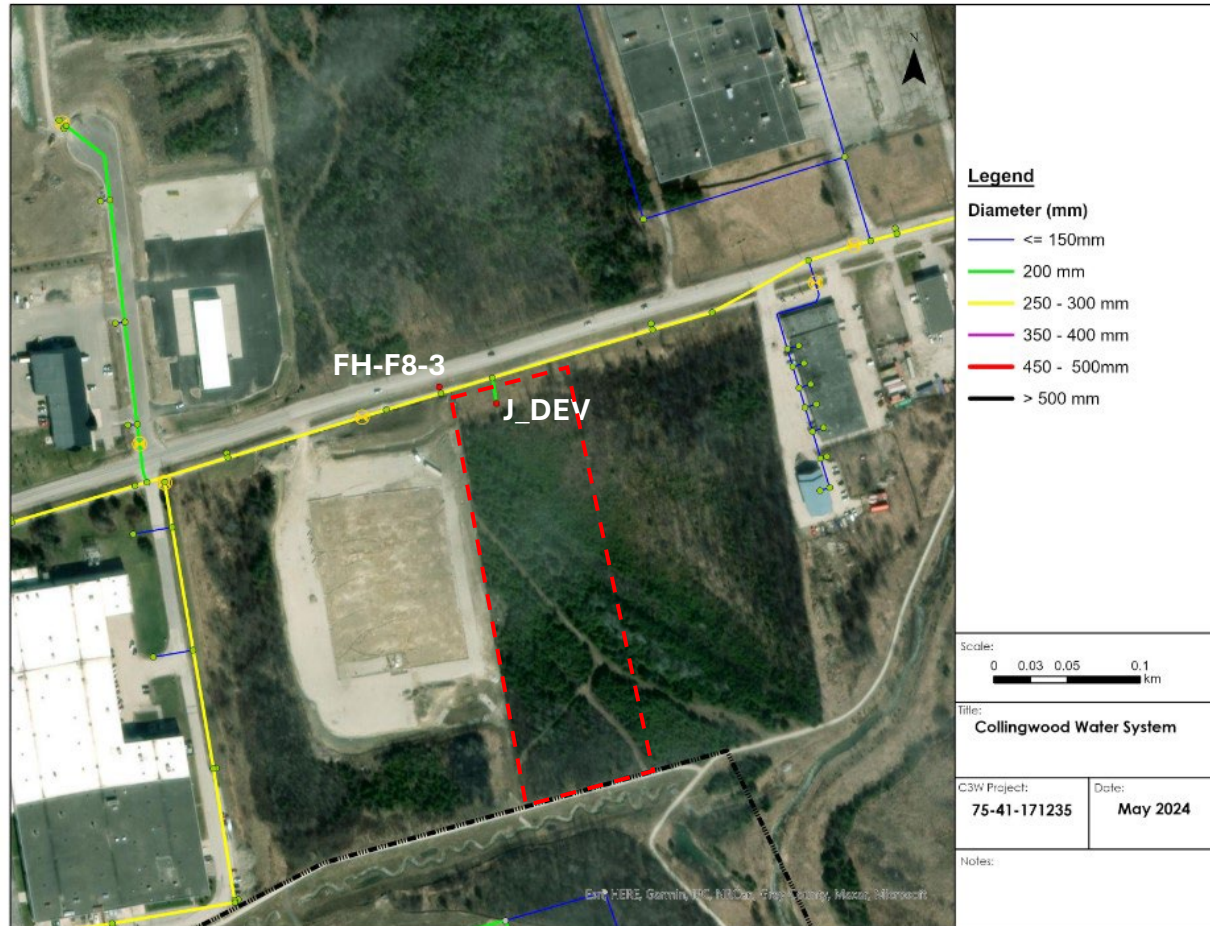
Pressure Requirement	Minimum	Maximum
Fire Flow Requirements		
Single-Family Residential	57 L/s	76 L/s
Institutional / Convenience / Commercial / Multi-Unit Residential	91 L/s	114 L/s
Industrial/Commercial Subdivisions	136 L/s	154 L/s
Downtown Commercial	136 L/s	189 L/s
Pressure Requirements		
Maximum Day Demands + Fire Flows	20 psi	
Standard Operating Conditions	40 psi (Peak Hour)	50 - 80 psi

2.2 Domestic Demand

Demands were provided by Tatham Engineering and are available in the FSR. The population density was determined from the Amendment to Town of Development Standards, which specifies a demand rate (light industrial) of 35 m³/ha/day. The detailed preliminary demand calculation can be found in Appendix B. The maximum day demand (MDD) and Peak Hour Demand (PHD) were calculated using peaking factors of 2 and 2.7, respectively, as per Town Standards (August 2022). The ADD, MDD and PHD for the development are summarized in Table 2-2, and Figure 2-1 illustrates the node locations in the development in which the demands were assigned.

Table 2-2: Estimated Domestic Demands for the Proposed Development (SLA)

Development	Demand (L/s)		
	ADD	MDD	PHD
140 Mountain Rd	0.82	1.64	2.21

**Figure 2-1: Demand Nodes in the Development**

2.3 Fire Flow Demand

The fire flow requirement for the proposed development was determined by Tatham Engineering to be the maximum between the Town of Collingwood design standards (136 L/s for an industrial/commercial subdivision) and the Fire Underwriters Survey (FUS) (133 L/s) both under MDD conditions. The hydraulic water model demand calculations were completed in the FSR and are provided in Appendix B.

3 Analysis

3.1 Available Fire Flow

3.1.1 Pre-Development

Modelling was conducted to determine the available fire flows at a residual pressure of 20 psi at 12:00 PM under MDD conditions. The fire flows were modelled to last for 2 hours. The fire flow simulation was run under existing (2020) conditions with up to two pumps operating at Carmichael PS under existing conditions.

Under near future conditions the Carmichael PS has been upgraded. Up to 2 VFDs were set to run consistently, and one fire pump was turned on for the fire event. During a fire event, if pressures on the Zone 1 side of Carmichael PS drop, a control valve in the PS will open and allow water from Carmichael to flow into Zone 1.

The fire flow results predicted by the model are representative of the amount of water available in a watermain and not the extent of flows available from a hydrant. Several hydrants may need to be operated to provide desired fire flows but may not be equivalent to model results.

The theoretical flow was tested in the proposed development area based on site plan drawings shown above. The model was used to determine the available fire flow at the existing hydrant and connection node under pre-development conditions. With two pumps on at Carmichael PS, fire hydrant FH-F8-3 satisfied the FUS fire flow requirements of 133 L/s, but not the city's fire flow requirement of 136 L/s. Table 3-1 summarizes the available fire flows at the development connection.

Table 3-1: Available Fire Flow (L/s) Under Pre-Development

Node	Existing All Pumps Off	Existing 1 Pump On	Existing 2 Pumps On
FH-F8-3	67	105	135
J_DEV	68	107	141

3.1.2 Post Development

The model was used to determine the available fire flow at the existing hydrant and connection point under 2020 MDD conditions with the proposed development demands. With two pumps on, fire hydrant FH-F8-3 satisfied the FUS fire flow requirements of 133 L/s, but not the city's fire flow requirement of 136 L/s. With the upgrades to Carmichael and the potential zone boundary valve at Tenth and Mountain Rd, the fire

flow increased to 153 L/s, meeting the Town's guidelines. Table 3-2 summarizes the available fire flow at the connection and fire hydrant.

Table 3-2: Available Fire Flow (L/s) Under Post Development

Node	Existing All Pumps Off	Existing 1 Pump On	Existing 2 Pumps On	Near Future 3 Pumps On
FH-F8-3	65	103	134	153
J_DEV	68	107	141	166

3.2 System Pressures

Pressure results are summarized in Table 3 3 and Table 3 4 under pre-development and post development conditions, respectively, with all pumps off at Carmichael PS. Under each of the scenarios, the pressures ranged between 44 – 70 psi which are within the City's allowable operating pressure range of 50 – 80 psi, and minimum 40 psi at Peak Hour. The pressure results in the model are representative of pressures available in the watermain. The developer is responsible for determining if adequate pressure is available in multi-storey buildings.

Table 3-3: Pressure Results (psi) Pre-Development

Node	ADD			MDD		
	Max	Min	Avg	Max	Min	Avg
FH-F8-3	63	54	57	58	44	51
J_DEV	70	61	64	65	51	57

Table 3-4: Pressure Results (psi) Post Development

Node	ADD			MDD		
	Max	Min	Avg	Max	Min	Avg
FH-F8-3	63	54	56	57	43	50
J_DEV	70	61	63	64	50	57

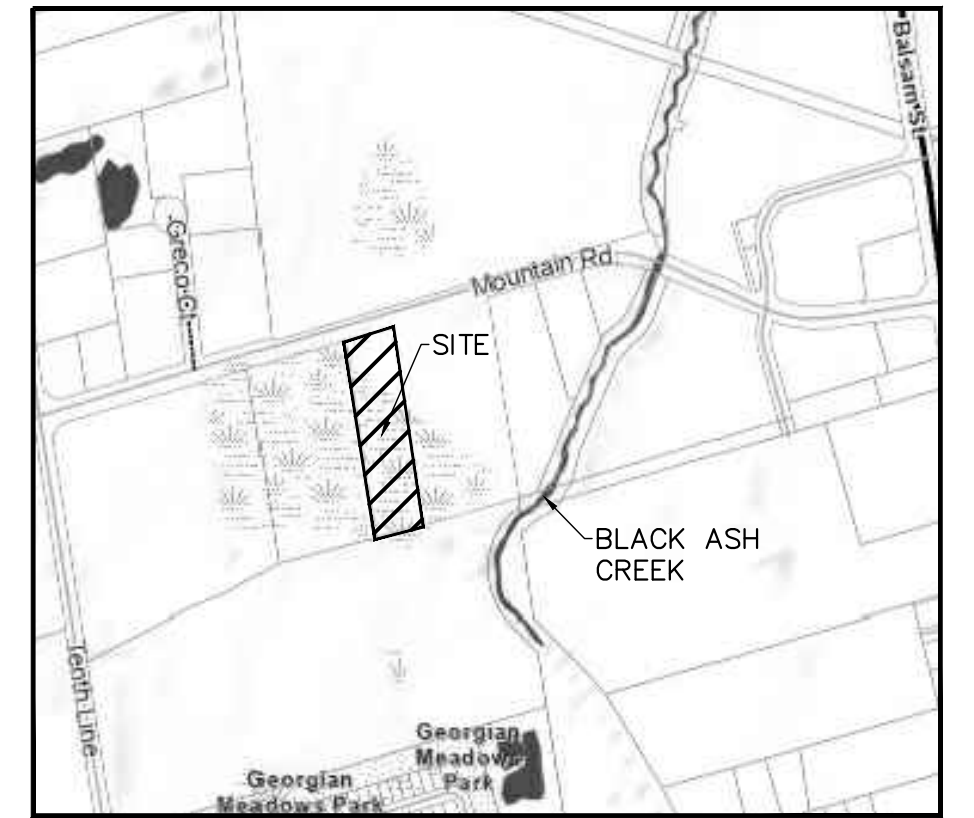
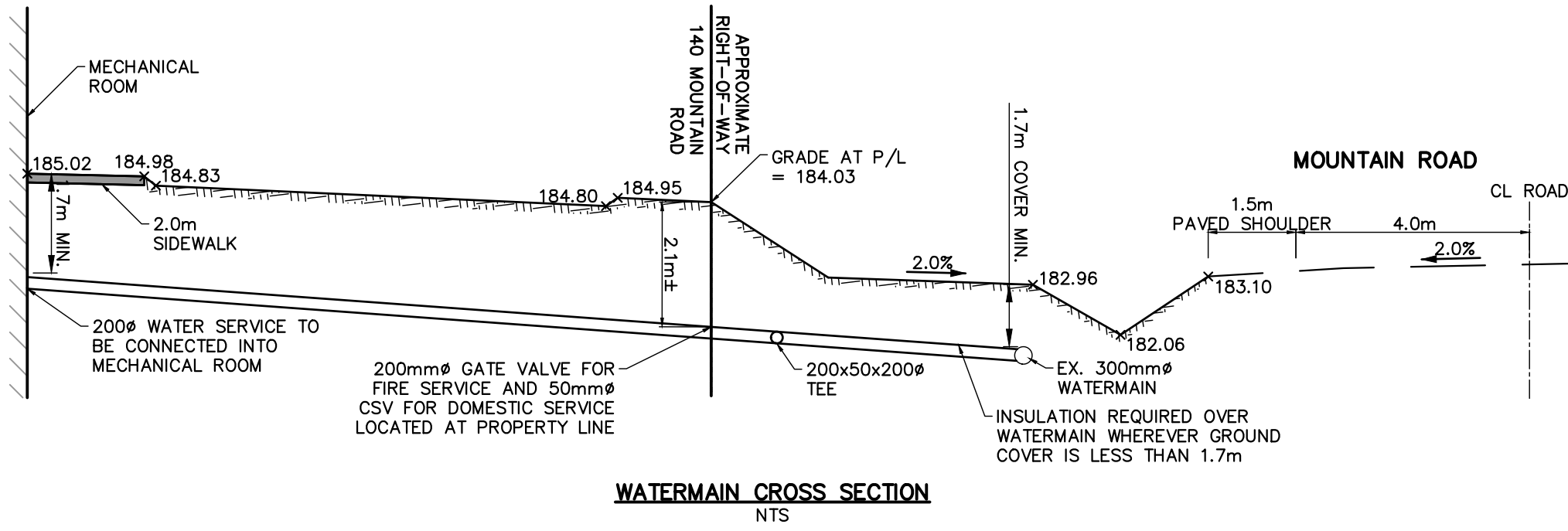
4 Conclusions

The hydraulic assessment of the proposed 140 Mountain Road development demonstrated the following:

- 1) With two pumps on, fire hydrant FH-F8-3 satisfied the FUS fire flow requirements of 133 L/s under existing conditions, but not the Town's fire flow standard of 136 L/s. However, with the upgrades to Carmichael PS and the potential zone boundary valve at Tenth Line and Mountain Rd, the fire flow increased to 153 L/s, meeting the Town's guidelines under near future conditions.
- 2) The service pressures under existing conditions and ultimate build-out (currently 2020) conditions are expected to range between 44 – 70 psi, which are within the City's allowable operating pressure range of 50 – 80 psi, and minimum 40 psi at Peak Hour.

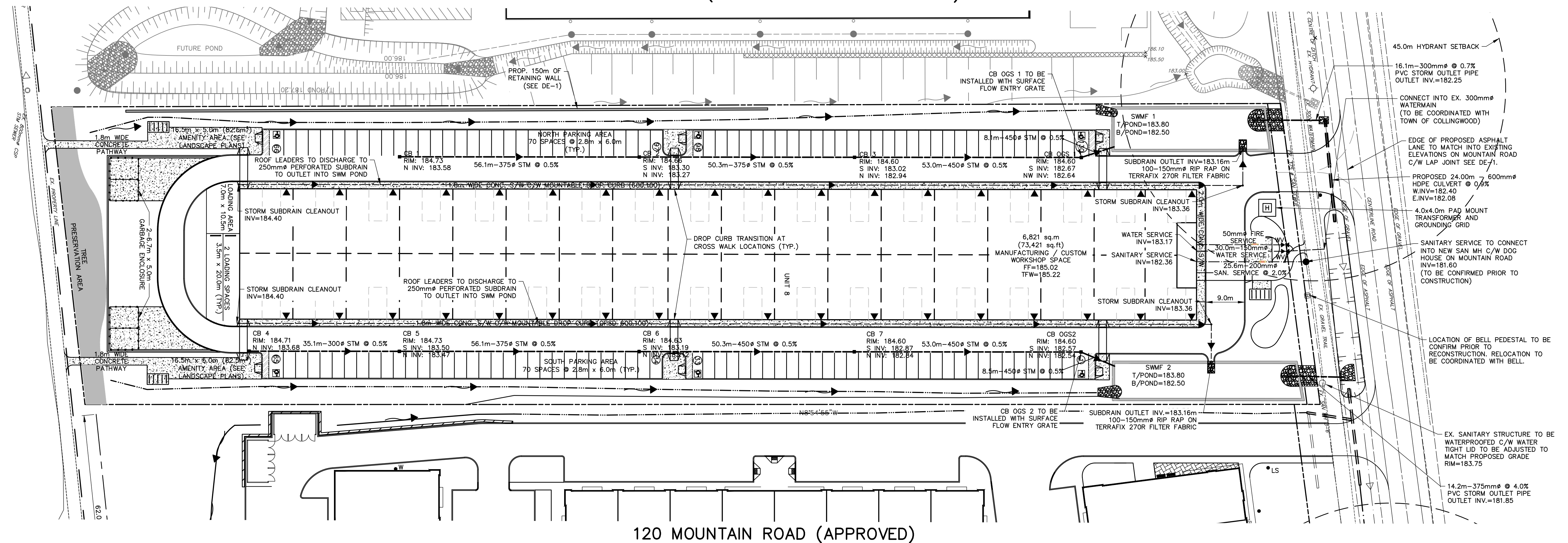
A

Appendix A: Site Plan



KEY PLAN

180 MOUNTAIN ROAD (CONSTRUCTION IN PROGRESS)



ACCEPTED FOR
CONSTRUCTION
TOWN OF COLLINGWOOD

PER _____
DATE: _____

DISCLAIMER AND COPYRIGHT

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

TATHAM ENGINEERING LIMITED CLAIMS COPYRIGHT TO THIS DRAWING WHICH MAY NOT BE USED FOR ANY PURPOSE OTHER THAN THAT PROVIDED IN THE CONTRACT BETWEEN THE OWNER/CLIENT AND THE ENGINEER WITHOUT THE EXPRESS CONSENT OF TATHAM ENGINEERING LIMITED.

BENCHMARKS

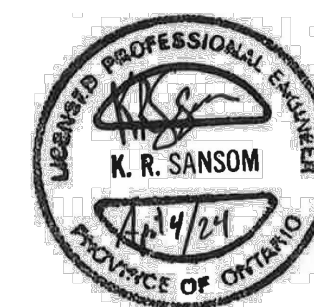
TBM2 - ELEVATION 189.765
NAIL & WASHER ON NORTH FACE OF HYDRO POLE
LOCATED ON NORTH SIDE OF MOUNTAIN ROAD JUST
WEST OF EXISTING ACCESS TO SITE.

NOTES

LEGAL INFORMATION SHOWN FROM REGISTERED PLAN
51R-41847 BY ZUBEK, EMO, PATTEN & THOMSEN
LIMITED, DATED NOVEMBER 16, 2018 AND SIGNED BY
PAUL R. THOMSEN.

No.	REVISION DESCRIPTION	DATE
1.	FIRST SUBMISSION	DEC 20/22
2.	SECOND SUBMISSION	AUG 2023
3.	THIRD SUBMISSION	JAN 26/24
4.	FOURTH SUBMISSION	APR 4/24

ENGINEER STAMP



140 MOUNTAIN ROAD
TOWN OF COLLINGWOOD

SITE SERVICING PLAN

TATHAM
ENGINEERING

DESIGN: MR/KRL	FILE: 121036	DWG: SS-1
DRAWN: MR/KRL	DATE: JUN 2022	
CHECK: KRS	SCALE: 1:500	

B

Appendix B: Demand and Fire Flow Calculations

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							
			Wood Frame	1.5	Non-combustible construction	0.8	-	N/A		
				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							
			Single Family	1		0	Units	N/A		
				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	Square Metres (m2)	N/A	
		Total Floor Area - One Storey of Townhouse/Apartment Block					0			
		Total Floor Area - All Storeys					6821			
		Does the building have fire-resistive design?				No	6821			
		Are vertical openings/communications properly protected (1 hour rating)?				No	6821			
		Total Floor Area (A) - for all storeys excluding basement - Single Family					6821			
		Measurement Units	Square Feet (ft²)	0.093		6821	m²	N/A		
			Square Metres (m²)	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	15,000		
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	(3,750)	11,250	
			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	(3,375)	7,875	
			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	%	-	7,875	
			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:									8,000	
6	Required Fire Flow, Duration and Volume	Total Required Fire Flow (above) in L/s:							133	
		Required Duration of Fire Flow of					8,000 L/min (hrs):	2		
		Required volume for Fire Flow of					8,000 L/min (m³):	960		

Demand Rate - Light Industrial

 35.0 m³/ha/day (Gross ha site area)

Average Day Demand (ADD)

$$\begin{aligned}
 &= \text{Site Area} \times \text{Demand Rate} \\
 &= 2.02 \text{ ha} \times 35.0 \text{ m}^3/\text{ha}/\text{day} \\
 &= 70.7 \text{ m}^3/\text{day} \\
 &= 70700 \text{ L}/\text{day} \\
 &= 0.82 \text{ L}/\text{s}
 \end{aligned}$$

Peak Factors

Maximum Day	=	2	(as per Town Standards, Aug 2022)
Peak Hour	=	2.70	(as per Town Standards, Aug 2022)

Fire Flow (Calculated by FUS)

$$= 133 \text{ L}/\text{s}$$

Fire Flow (Min as per Town Standards)

$$= 136 \text{ L}/\text{s} \quad (\text{Minimum per Town Development Standards})$$

Maximum Day Demand (MDD)

$$\begin{aligned}
 &= \text{ADD} \times \text{Maximum Day Peak Factor} \\
 &= 0.82 \times 2.00 \\
 &= 1.64 \text{ L}/\text{s}^*
 \end{aligned}$$

Peak Hour Demand (PHD)

$$\begin{aligned}
 &= \text{ADD} \times \text{Peak Hour Peak Factor} \\
 &= 0.82 \times 2.7 \\
 &= 2.21 \text{ L}/\text{s}
 \end{aligned}$$

MDD + Fire Demand

$$\begin{aligned}
 &= \text{MDD} + \text{Fire Flow} \\
 &= 1.64 + 133.0 \\
 &= 134.64 \text{ L}/\text{s}
 \end{aligned}$$



Engineering
for **people**