TATHAM ENGINEERING

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The Gateway Centre

PRELIMINARY FUNCTIONAL SERVICING REPORT

Charis Developments

File 120119 | July 8, 2025

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Prepared by:

Tatham Engineering Limited
115 Sandford Fleming Drive, Suite 200
Collingwood, Ontario L9Y 5A6

T 705-444-2565
tathameng.com

Prepared for:

Charis Developments
204-186 Hurontario Street
Collingwood, Ontario L9Y 4T4

Authored by:	Reviewed by:
	
Andrew Schoof, M.A.Sc., P.Eng. Engineer, Project Manager	Randy Simpson, B.A.Sc., P. Eng. Manager – Land Development

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Issue	Date	Description
1	April 6, 2022	OPA/ZBA 1st Submission
2	September 16, 2024	Revised Site Plan
3	July 8, 2025	Revised Site Plan

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Richard Ziegler Architect Inc.

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Tatham Engineering Limited

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1 Introduction

Tatham Engineering has been retained by Charis Developments to prepare a Preliminary Functional Servicing Report to support an official plan amendment (OPA) and zoning by-law amendment (ZBA) for the proposed Gateway Centre Commercial Development in the Town of Collingwood, County of Simcoe.

1.1 OBJECTIVES

The primary objective of this report is to address the servicing requirements of the Town of Collingwood and Simcoe County with respect to the existing and proposed sanitary servicing, water supply and distribution, drainage and stormwater management (SWM), safe vehicular access to the site and utilities commonly required to support a commercial development (phone, hydro, cable, TV, gas, etc.).

1.2 GUIDELINES & BACKGROUND REPORTS

This report was prepared recognizing municipal and provincial guidelines, including the following publications:

- *Design Criteria for Sanitary Sewers, Storm Sewers and Forcemains for Alterations Authorized under Environmental Compliance Approval,* Ministry of the Environment, Conservation and Parks (2023);
- *Town of Collingwood Development Standards* (2007, Amended 2022);
- *Water Supply for Public Fire Protection, Fire Underwriters Survey* (2020);
- *Ontario Building Code Compendium* (2024);
- *Town of Collingwood 2024 Annual Wastewater Performance Report (2025);*
- *Collingwood Drinking Water System 2024 Annual Compliance Report* (2025);
- 2024 Year End: Water and Wastewater Uncommitted Hydraulic Reserve Capacity Update (2025); and
- 869 Hurontario Street Development (Draft), Watermain Hydraulic Analysis, (February 2025) by CIMA+.

Additional reports have been prepared in conjunction with this report in support of the proposed commercial development and are summarized below:

- *Geotechnical Investigation Proposed Commercial Development – 839 and 869 Hurontario Street* (March 2022) by G2S Consulting Inc.;

- *Additional Geotechnical Investigation – 839, 853 and 869 Hurontario Street & 7564 Poplar Sideroad* (September 2024) by G2S Consulting Inc.;
- *L – The Gateway Centre Preliminary Feature Based Water Budget,* (June 2025) by Tatham Engineering;
- *Preliminary Stormwater Management Report* (June 2025) by Tatham Engineering; and
- *The Gateway Centre Traffic Impact Study* (June 2025) by Tatham Engineering.

2 Development Site

2.1 SITE LOCATION & DESCRIPTION

The subject property consists of approximately 3.75 ha of mostly undeveloped land located northeast of the Hurontario Street and Poplar Sideroad intersection in the Town of Collingwood. The proposed development incorporates four properties, the municipal addresses being part of 839 Hurontario Street, 853 Hurontario Street, 869 Hurontario Street and 7564 Poplar Sideroad. The subject property is bounded by Poplar Sideroad to the south, Hurontario Street to the west, residential homes to the east and a pedestrian path and the Hamilton Drain to the north. Figure 1 illustrates the location of the subject property.

2.2 SURFACE CONDITIONS

Information regarding the existing topography, ground cover and drainage patterns were obtained through collection of detailed topographic survey data and aerial imagery.

The topographic information (survey completed by J.D. Barnes Ltd. on September 13, 2023) indicates the majority of the site gently slopes north towards the Hamilton Drain via overland flow. The Hamilton Drain flows east towards the Pretty River Estates subdivision, ultimately discharging into the Pretty River.

There is an existing wetland at the northeast corner of the site regulated by the Nottawasaga Valley Conservation Authority (NVCA). The wetland includes an area of approximately 0.197 ha on-site and 0.094 ha offsite on adjacent private lands.

The remainder of the site drains to the roadside ditch along the north side of Poplar Sideroad and the east side of Hurontario Street. The ditch along the north side of Poplar Sideroad flows east to west, tying into the Hurontario Street ditch which flows north. A 500x660 mm CSPA culvert and a 900 mm diameter culvert bring external drainage from the south side of Poplar Sideroad into this ditch system, and ultimately towards the Hamilton Drain north of the subject property.

The site is currently vacant, and primarily grass covered. The centre of the site includes a vegetated 1.2 ha fill pad, and an overgrown wooded portion occupies the northern and eastern sections of the property. An existing single family residential dwelling is located on 853 Hurontario Street.

2.3 SUBSURFACE CONDITIONS

A geotechnical investigation, submitted under a separate cover, was completed by G2S Consulting Inc. dated March 2022 and an additional investigation was completed dated September 2024. Fieldwork was conducted between September 30 and October 22, 2021, consisting of 23 exploratory sampled boreholes. Two more boreholes were conducted on June 4 and 5, 2024. The boreholes extended to depths ranging from 2.1 m to 8.2 m below existing grade. Subsurface conditions are as follows:

- 75 to 360 mm of surficial topsoil;
- 9 boreholes indicated a clayey silt fill layer ranging from depths of 0.8 m to 1.2 m below grade;
- 8 boreholes indicated a granular fill (sand and gravel) layer ranging from depths of 0.9 m to 1.6 m below grade;
- a layer of clayey silt extending 1.5 m to 4.6 m below grade was identified below the fill (17 applicable boreholes) or topsoil (6 applicable boreholes);
- silt deposits were identified below the clayey silt layer at 11 borehole locations. The silt deposit depths ranged from 3.1 m to 6.1 m below grade;
- lower clayey silt deposits were encountered beneath the silt deposits in two borehole locations, extending to depths between 4.6 m and 6.1 m below grade;
- sandy silt till was encountered below the silt deposits in 12 locations with depths ranging from 5.2 m to 8.2 m below grade;
- sandy gravel till was encountered beneath the sandy silt till in both of the additional boreholes with depths ranging from 6.9 m to 7.5 m below grade; and
- limestone/dolostone was encountered at depths ranging from 6.9 m to 7.5 m below grade, and bedrock was encountered at depths ranging from 7.5 m to 11.1 m below grade.

For the purposes of hydrologic modelling, the soil has been classified as silt loam (Type BC).

Groundwater monitoring wells were previously installed in seven boreholes. Two new monitoring wells were installed in the additional boreholes. The groundwater was found to be approximately 0.4 m to 1.4 m below existing grade.

2.4 PROPOSED DEVELOPMENT

The proposed development will consist of the following facilities, as shown on the attached Site Plan. The site will be constructed in two phases, as summarized below.

FIRST PHASE

- Building 1 – Starbucks
- Building 2 – Dollarama
- Building 5 – Grocery Store – No Frills
- Building 6 – Shopper's Drug Mart and Retail
- Building 7 – McDonald's
- Building 8 – Restaurant/Commercial, Pet Valu and Commercial/Office
- 222 commercial parking stalls required

SECOND PHASE

- Building 3 – 12-storey mixed-used building including a commercial area, 165 two-bedroom apartment units, rooftop amenity space and underground parking
- Building 4 – Retail building with offices above
- 67 commercial parking stalls required
- 207 residential parking stalls required

SITE PARKING

- 289 parking stalls required for commercial use
- 295 parking stalls provided for commercial use
- 207 parking stalls required for residential use
- 297 parking stalls provided for residential use
- 10 accessible spaces required (2% of required parking)
- 14 accessible spaces provided

3 Sanitary Sewage Collection & Conveyance

3.1 EXISTING INFRASTRUCTURE

An existing 200 mm diameter sanitary stub extends off an existing 200 mm diameter sanitary sewer flowing north underneath Hurontario Street. The stub extends into the subject site 70 m north of Poplar Sideroad. Additionally, an existing 250 mm diameter sanitary sewer flowing east to west is located north of the property, under the Hamilton Trail, which also connects to the existing 200 mm diameter Hurontario Street sanitary sewer. Ultimately sewage is discharged to the Collingwood Wastewater Treatment Plant (WWTP). The existing sanitary sewer network is depicted in drawing *SAN.1: Sanitary Layout Plan*.

In reviewing the *Town of Collingwood 2024 Annual Wastewater Performance Report*, the plant has an average day flow rated capacity of 24,548 m^3/day and a maximum day flow rate capacity of 60,900 m^3/day. The report shows an average day flow and maximum day flow of 16,792 m^3/day and 39,567 m^3/day respectively, operating at 68% of its average day flow rated capacity and 65% of its maximum day flow rated capacity. The available average day and maximum day surplus capacities are 7,756 m^3 and 21,333 m^3 respectively. The 2024 Year End: Water and Wastewater Uncommitted Hydraulic Reserve Capacity Update, establishes an uncommitted hydraulic reserve capacity of 4,522 m3, accounting for existing capacity commitments and a 5% factor of safety.

3.2 PROPOSED INFRASTRUCTURE

3.2.1 Sewage Loading

The *Town of Collingwood Development Standards* (2007), *MOE Design Guidelines for Sewage Works* (2008) and the *Ontario Building Code* were used as a guide to determine the expected sanitary sewage flow from this site. The commercial and residential sewage flows were calculated separately. In the absence of flow data, the average sewage generation from the commercial buildings was estimated using Table 8.2.1.3.B in the Ontario Building Code and the sewage generation from the apartment building was calculated using the Town design standards of 1.9 cap/unit and 260 L/cap/day. The peak factor for the site was calculated using the Harmon Formula. The total sewage generated by the commercial and residential development and extraneous flow results in an estimated peak flow of 8.22 L/s. Supporting calculations are attached in Appendix A.

3.2.2 Sanitary Sewer

It is anticipated that a proposed 200 mm PVC sanitary sewer will flow north through the site's service corridor. The sanitary sewer will be sized at detailed design to accommodate the proposed development. A sanitary sewer stub near the southeast corner of the subject property was also provided. Refer to drawing *SAN.1: Sanitary Layout Plan* for further details pertaining to the proposed sanitary sewer. A preliminary sanitary sewer design sheet is attached in Appendix D.

The proposed sanitary sewer will be installed as part of Phases 1 and 2. No additional sanitary sewer will need to be installed as part of Phase 3.

3.2.3 Sanitary Sewer Connection

The sewer will connect to the existing 250 mm diameter sanitary sewer north of the subject site. An additional maintenance structure at the connection will be required. The sanitary flows from the neighbouring Pretty River Estates development to the east utilizes the 250 mm sanitary sewer. In reviewing the Functional Servicing Report completed by exp Services (July 2012), a total of 1,383 residents in the Pretty River Estates contribute to the sanitary sewer, resulting in a peak flow of 32.4 L/s of sewage, utilizing the Town's previous standards of 2.9 cap/unit and 450 L/cap/day. Utilizing the Town's current design standards, Pretty River Estates and the Gateway development will generate a combined peak sanitary flow of 28.6 L/s, which is 56% of the existing sewer's 50.8 L/s capacity. Thus, the existing sanitary sewer has sufficient capacity to accommodate the peak flows from the proposed development. Refer to the Sanitary Sewer Design Sheets in Appendix D for further details.

The connection point to the trunk sewer was investigated and confirmed that the existing sanitary sewer is at sufficient depth for a sanitary service connection to the proposed buildings.

The presence of a sanitary stub 70 m north of Poplar Sideroad to the subject site indicates that the Hurontario Street sanitary sewer considers loading from the proposed site. While this stub is not planned to be utilized, the sanitary flows from the site will connect to the Hurontario Street sanitary sewer 157 m north of the stub. The Town of Collingwood operates a hydraulic model of their sanitary sewer system. We request that the Town add the proposed development to their model and confirm that the downstream sewer system can accommodate the proposed development.

3.2.4 Sanitary Service Connections

Each building will connect to the proposed 200 mm diameter sanitary sewer main via a 125 mm diameter PVC sanitary service. The minimum required slope of these services is 1.0%. The required flow and maximum capacity of the sanitary services is summarized in Appendix B. The capacity

of the sanitary services exceeds the flow requirements of each building, and therefore the services are of sufficient size.

4 Water Supply & Distribution

4.1 EXISTING INFRASTRUCTURE

An existing 200 mm water service stub with a main and curb stop valve enters the subject site approximately 70 m north of Poplar Sideroad. The water service stub connects to an existing 200 mm diameter ductile iron watermain running north-south on the west side of Hurontario Street across from the proposed development. The watermain terminates immediately south of the water service stub connection with a plug, thrust block and 25 mm blow off valve. North of the proposed development there is an existing 500 mm watermain running under and parallel to the Hamilton Trail. There is no existing watermain on Poplar Side Road. East of the Site there is a 150 mm diameter watermain running north-south on Huges Street. The existing water distribution network is depicted in drawing *WAT.1: Water Layout Plan*.

The Collingwood Water Treatment Plant has a rated capacity of 31,140 m^3/ day per the *Town of Collingwood 2024 Annual Summary Report*. The report showed maximum day flow of 25,476 m^3/day (82% of rated capacity). The 2024 Year End: Water and Wastewater Uncommitted Hydraulic Reserve Capacity Update, establishes an uncommitted hydraulic reserve capacity of 1,379 m^3, accounting for existing capacity commitments and a 5% factor of safety.

4.2 PROPOSED INFRASTRUCTURE

4.2.1 Water Demand

The Town of Collingwood Development Standards (2007) and the Ontario Building Code were used as a guide to determine the expected water demand consumption for this site. The average commercial water consumption demand was calculated using Table 8.2.1.3.B in the Ontario Building Code. The average day commercial flow was calculated to be 80.4 m^3/day and the average day residential flow was calculated to be 81.5 m^3/day making the total average day flow 161.9 m^3/day which is equivalent to 215.5 single detached units. Refer to Appendix A for a breakdown of the expected water demands of each commercial building.

4.2.2 Watermain

A proposed 250 mm ductile iron watermain running underneath the subject site's access corridors will service the proposed development. The proposed watermain will connect to the existing 500 mm diameter watermain along the Hamilton Drain, will be reduced to connect to the existing 200 mm diameter stub from the Hurontario Street watermain, and will be further reduced to connect to the existing 150 mm diameter watermain on Hughes Street, creating a looping system. Refer to drawing *WAT.1: Water Layout Plan* for further details. The proposed watermain

will be installed as part of the works associated with Phases 1 and 2. No additional watermain will need to be installed as part of Phase 3. Refer to Appendix B for watermain calculations confirming the 250 mm diameter watermain will provide sufficient capacity to achieve the peak hour demand and requisite fire flows.

4.2.3 Watermain Connection

The proposed watermain connects to the existing 200 mm diameter stub from the Hurontario Street watermain, the existing 150 mm diameter watermain on Hughes Street and the existing 500 mm diameter watermain adjacent to the Hamilton Drain. As the Town of Collingwood operates a hydraulic model of their water distribution system, we request that the Town add the proposed development to their model and confirm that the required demand flows can be achieved within the applicable pressure ranges.

4.2.4 Water Service Connections

It is anticipated that Buildings 1, 2, 4, 6, 7 and 8 will connect to the proposed watermain via 50 mm diameter water service lines, whereas Buildings 3 and 5 (grocery store) will connect via 150 mm diameter water services to supplement internal sprinkler systems. The required flow and maximum capacity of the water service lines are summarized in Appendix B.

Water meters will be installed internal to each individual building to record water consumption. The proposed facilities will be provided with backflow prevention devices in accordance with the Ontario Building Code and the Town's water by-law. The backflow prevention devices will also be installed internal to the building to allow for testing and maintenance as may be required.

4.3 FIRE PROTECTION

Two fire hydrants exist near the proposed development, located on the west side of Hurontario Street approximately 80 m and 180 m north of Poplar Sideroad, respectively. It is anticipated that internal fire hydrants will be required to provide the requisite fire flows for the development. The proposed fire hydrant locations will be provided at the detailed design stage.

The required fire flows for each building were calculated in accordance with the *Fire Underwriters Survey Water Supply for Public Fire Protection Practices* (2020) and the *Town of Collingwood Development Standards* (2007) are summarized in Appendix C. The preliminary calculations account for a separate fire line for a sprinklered system in Buildings 3 and 5 (grocery store), the fire and domestic services will be separated at the building with isolation valves. These fire lines will not be metered.

Referring to the Watermain Hydraulic Analysis report prepared by CIMA+ for the subject development, the existing water servicing infrastructure combined with the proposed 250 mm

watermain is capable of supplying fire flows between 189 L/s and 193 L/s to the site in the near future condition model. To reduce the fire flow demands, the Fire Underwriters Survey calculations for Building 3 have been revised to reflect the use of non-combustible building materials, resulting in a demand of 150 L/s. Similarly, the wall joining the proposed grocery store (Building 5) and Building 6 will need to consist of a 2-hour rated vertical fire wall, thus reducing the exposure distance between the two buildings. The resulting fire flow demands for the grocery store (Building 5) and Building 6 are 150 L/s and 183 L/s respectively. Supporting calculations are provided in Appendix D.

5 Stormwater Management

A separate Stormwater Management (SWM) Report has been prepared by Tatham Engineering to address drainage and stormwater management requirements for the development. A summary of the SWM servicing strategy is as follows:

- Stormwater management quantity control will be provided by a proposed underground storage system under the parking area between Building 2 and the grocery store. Stormwater will be conveyed via an internal storm sewer network to the underground storage system. Additional storage capacity will be provided by rooftop storage on the grocery store which will discharge to a soakaway pit. Major peak flows (up to and including the 100-year storm event) from the site will be attenuated to pre-development levels. Storm flows from the underground storage facility and flows exceeding the capacity of the soakaway pit will discharge into the Hamilton Drain.
- The soakaway pit will receive and infiltrate runoff from the grocery store to satisfy the Nottawasaga Valley Conservation Authority's (NVCA) requirements for a feature-based water budget for the wetland in the northeast corner of the site. The design is further detailed in the document *L – The Gateway Centre Preliminary Feature Based Water Budget,* (June 2025) prepared by Tatham Engineering.
- Emergency overland flow routes will be designed to convey stormwater to the northern most parking area. Excessive runoff will spill through curb cuts, across the Hamilton Trail and into the Hamilton Drain. The maximum ponding depth will not exceed 300 mm before spilling off-site.
- Stormwater quality control will be provided by a HydroStorm HS10 located downstream of the underground system. The HydroStorm HS10 will provide a minimum of 80% total solids removal and will treat 90% of the surface runoff generated from its contributing drainage area. Additional quality control will be provided by isolator rows as part of the underground storage system. Quality control is not required for runoff from the grocery store roof as it is considered clean.

The SWM report should be read in conjunction with this report.

6 Transportation

A Traffic Impact Study has been completed by Tatham Engineering under separate cover. A summary of the conclusions and recommendations are as follows:

- The proposed parking provisions, loading space provisions and circulation are all considered appropriate.
- The study area traffic operations, Poplar/Country Road 32 with Hurontario Street/County Road 124 were analyzed under existing (2024) and future (2026, 2030, 2035 and 2040) conditions with the following recommendations set forth:
  - 2030 Background Conditions - consider a southbound advance green on Hurontario Street at Poplar Sideroad;
  - 2040 Background Conditions - provide an eastbound right turn land on Poplar;
  - 2026 Total Conditions (Phase 1) - extend the 50 km/h speed zone on Hurontario Street to south of Poplar Sideroad; extend the centre turn lane on Hurontario Street 100 metres to the south; construct a centre turn lane on Poplar Sideroad from Hurontario Street to Portland Street; and construct a westbound right taper (60 metres) at Access 2.
- The proposed drive-thru lanes are considered appropriate.
- The available sight lines along both Poplar Sideroad/County Road 32 and Hurontario Street/County Road 124 exceed the design guidelines for site distance requirements.

7 Utilities

7.1 ELECTRICAL SERVICES

As part of the detailed design is support of site plan approval, Tatham Engineering will be reviewing the proposed development from an electrical servicing standpoint and will confirm if external plant upgrades are required to service the site following submission of an electrical distribution plan.

7.2 GAS SERVICES

Enbridge Gas was contacted about their existing gas mains in the area and their ability to service the proposed development. They advised that they have a 200 mm extra high-pressure gas main adjacent to the proposed development, one on the east side of Hurontario Street and another on the north side of Poplar Sideroad. Enbridge suspects these mains will provide sufficient capacity for the site but will require load information to confirm. Tatham Engineering will be reviewing the proposed development and providing gas load estimations at the detailed design stage.

7.3 TELEPHONE & INTERNET SERVICES

Bell has confirmed the site can be serviced with fibre optic cable. Bell advised that eight ducts exist on the east side of Hurontario Street and three ducts exist on the north side of Poplar Sideroad.

Rogers has indicated that they have an existing vault at the northeast corner of Poplar Sideroad and Hurontario Street.

7.4 POSTAL SERVICES

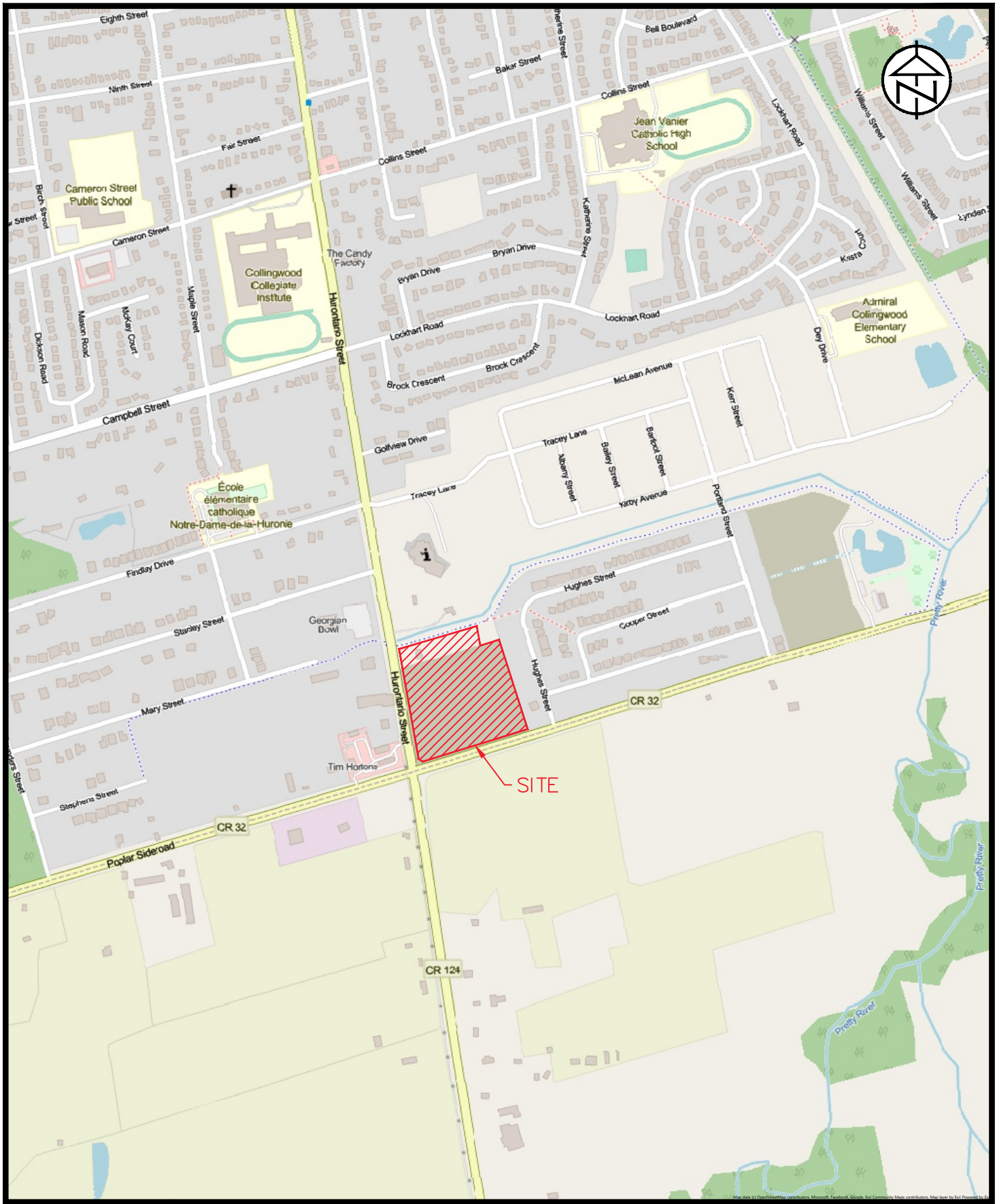
Canada Post has confirmed that a lock box assembly supplied by the developer would be required for postal services.

8 Summary

As outlined above, existing infrastructure surrounding the subject property can adequately service the development for sanitary sewage, potable water, stormwater management, hydro, natural gas, and telecommunications. A summary of the servicing strategy is as follows:

- Sanitary sewage from the proposed development will drain to the existing municipal sanitary sewer north of the proposed site via a proposed 200 mm diameter PVC sanitary sewer. An additional maintenance structure will be required to tie into the existing sanitary sewer.
- Potable water will be provided via a 250 mm watermain connecting to the existing 200 mm diameter watermain stub on Hurontario Street, the existing 150 mm diameter watermain on Hughes Street and the existing 500 mm diameter watermain that runs along the Hamilton Drain north of the site.
- Stormwater management quantity control will be provided by a combination of an underground storage system under the parking area, and rooftop storage on the grocery store discharging to a soakaway pit. Stormwater will discharge into the Hamilton Drain.
- The proposed soakaway pit will satisfy the NVCA's feature-based water budget requirements for the wetland in the northeast corner of the site.
- Stormwater management quality control will by provided by isolator rows within the underground storage system and a HydroStorm HS10, providing at least 80% total solids removal and treatment of 90% of the surface runoff generated from its contributing drainage area.
- Hydro, natural gas, Bell and cable TV will be extended from their existing plants to service the proposed development.
- Postal services require a lock box assembly supplied by the developer.

Detailed drawings will be completed for approval by the Town and relevant regulatory agencies in support of Site Plan Approval.



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THE GATEWAY CENTRE

KEYPLAN

DWG. No.

FIG. 1

SCALE: NTS	DRAWN: KH	DATE: JUN 2025	JOB NO. 120119

Drawing Name: 120119-FIG01.dwg, Plotted: Jun 27, 2025

PARKING - COMMERCIAL

Parking aisle minimum width of 6.0 metres
Parking space minimum dimensions of 2.8 m x 6.0 m
Accessible parking space minimum dimensions 4.5 m x 6.0 m
Dual accessible parking spaces at 3.4 m x 6.0 m with 1.5 m shared aisle

Commercial					
Building	Rate	Gross Area	Gross Floor Area*	Parking Req'd	Parking Provided
01 Restaurant	8/100 m2	225.5 m2	157.0 m2	13	
02 Commercial	3/100 m2	929.0 m2	836.1 m2	25	
03 Commercial	3/100 m2	654.5m2	589.1 m2	18	
04 Commercial	3/100 m2	1,799.4 m2	1,619.5 m2	49	
Grocery Store	3/100 m2	2879.9 m2	2015.9 m2	60	
06 Commercial	3/100 m2	1,851.4 m2	1,666.3m2	50	
07 Restaurant	8/100 m2	410.9 m2	287.0 m2	23	
08 Commercial	3/100 m2	846.8 m2	762.1 m2	23	
08 Restaurant	8/100 m2	491.4 m2	344.0 m2	28	
Total				**289**	**295**

**Gross Floor Area as defined by the Town of Collingwood Zoning By-law and is based on Gross Area –10% for general commercial uses and -30% for grocery store and restaurant uses.*

DELIVERY / LOADING SPACES

1 Delivery Space for GFA between 460.0 m2 and 2,500.0 m2
1 Loading Space for GFA between 2,501.0 m2 and 7,000.0 m2
Delivery Spaces at 3.5 m (w) x 7.5 m (l) x 3.0 (v)
Loading Spaces at 3.5 m (w) x 20.0 m (l) x 4.5 m (v)

Building	Use	Gross Area	Gross Floor Area	Type Required	Type Provided
Building 01	Restaurant	225.5 m2	157.0 m2	N/A	1 Delivery Space
Building 02	Commercial	929.0 m2	790.0 m2	1 Delivery Space	1 Loading Space
Building 03	Mixed-Use	654.54 m2	589.1 m2	1 Delivery Space	1 Delivery Space
Building 04	Commercial	1,799.4 m2	1,619.5 m2	1 Delivery Space	1 Delivery Space
Grocery Store	Commercial	2879.9 m2	2015.9 m2	1 Delivery Space	2 Loading Spaces
Building 06	Commercial	1,851.4 m2	1,666.3m2	1 Delivery Space	1 Loading Space 1 Delivery Space
Building 07	Restaurant	410.9 m2	287.0 m2	N/A	1 Delivery Space
Building 08	Commercial	1,338.2 m2	1,106.1 m2	1 Delivery Space	1 Delivery Space

**Gross Floor Area as defined by the Town of Collingwood Zoning By-law and is based on Gross Area –10% for general commercial uses and -30% for grocery store and restaurant uses.*

QUEUING AISLES

Parking space minimum dimensions of 2.8 m x 6.0 m

Building	Use	# of Spaces Required	# of Spaces Provided	Comments
Building 01	Restaurant	10	12	+2 Addn'tl Spaces Beyond Pick-up Window
Building 07	Restaurant	10	13	+3 Addn'tl Spaces Beyond Pick-up Window

THE GATEWAY CENTRE - ZONE PROVISIONS

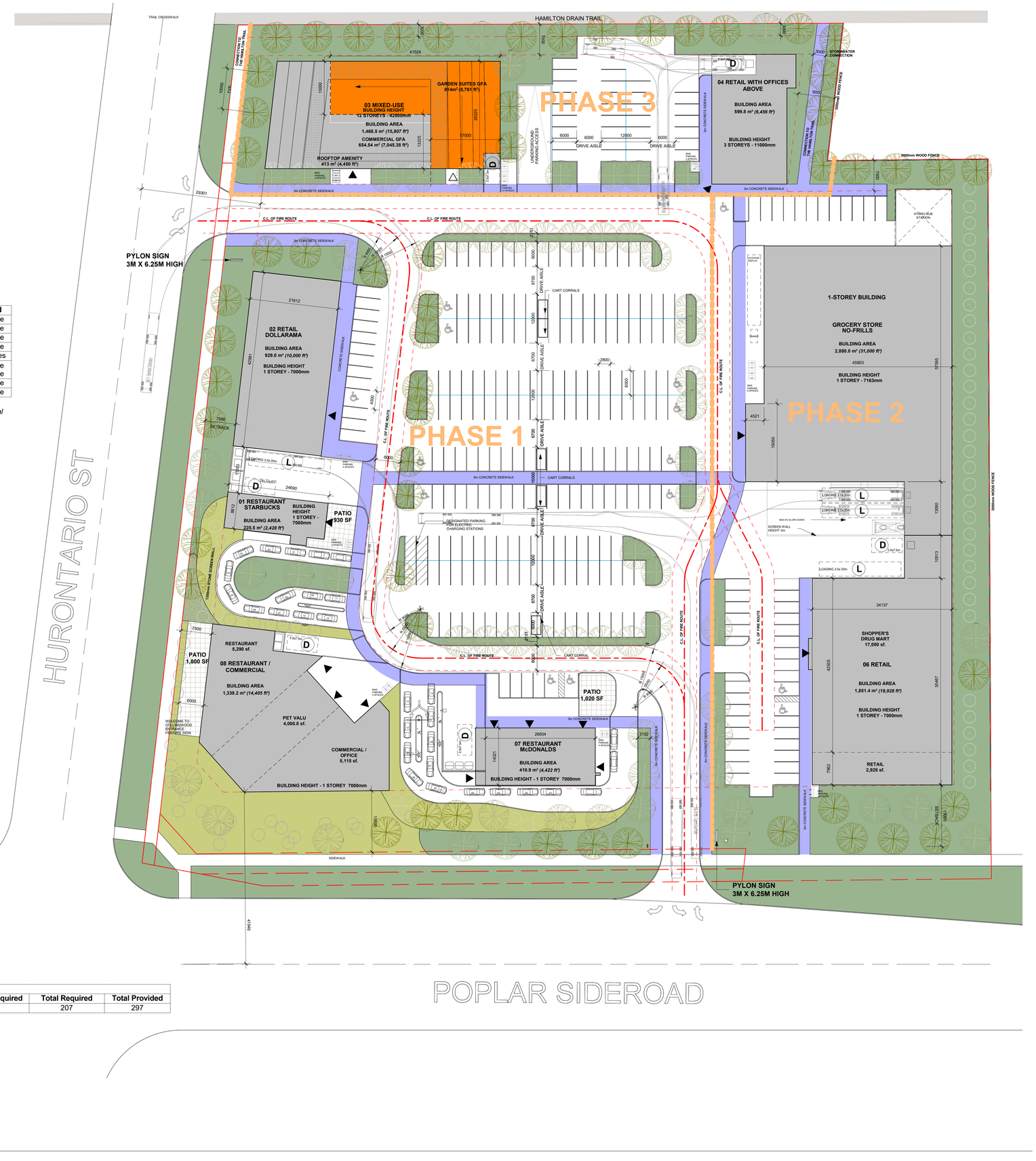
Provision	C4 Zone Requirement	Proposed
Minimum Lot Area	1,000.0 m2	37,604.1 m2
Minimum Lot Frontage (Hurontario Street)	30.0 m	193.98 m
Minimum Front Yard (Hurontario Street)	6.0 m	7.5 m
Minimum Exterior Side Yard (Poplar Sideroad)	9.0 m	15.0 m
Minimum County Setback @ Poplar Sideroad	15.0 m	15.0 m
Minimum Interior Side Lot Line (East Lot Line)	9.0 m	9.0 m
Minimum Rear Yard (North Lot Line)	7.5 m	7.5 m
Maximum Height	15.0 m	42.5 m
Maximum Lot Coverage	40%	27%
Minimum Landscape Open Space	10%	23%
Minimum Hurontario Street CL Setback	15.0 m	29.3 m
Minimum Poplar Sideroad CL Setback	18.0 m	41.95 m
Minimum Parking Space Setback	6.0 metres	> 6.0 metres
Entrance Width	7.5 m to 15.0 m	9.0 m
Maximum Number of Dwelling Units	N/A	165 units

PARKING - RESIDENTIAL

Parking aisle minimum width of 6.0 metres
Parking space minimum dimensions of 2.8 m x 6.0 m
Accessible parking space minimum dimensions 4.5 m x 6.0 m
Dual accessible parking spaces at 3.4 m x 6.0 m with 1.5 m shared aisle

Residential						
Building	Rate	# of Units	Resident Parking Required	Visitor Parking Required	Total Required	Total Provided
Building 03	1/unit + 0.25/unit for Visitors	165	165	42	207	297

2% of Required Parking Spaces to be Accessible = 5 spaces



ISSUED FOR DISCUSSION
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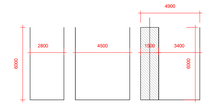
▽ RESIDENTIAL ENTRANCE
▼ RETAIL ENTRANCE



TYPICAL PARKING SPACE | BARRIER FREE PARKING SPACE TYPE 1 | BARRIER FREE PARKING SPACE TYPE 2

PARKING SPACE CONFIGURATIONS

NO.	ISSUANCE	DATE
03	ISSUED FOR CLIENT APPROVALS	2024.12.10
02	ISSUED FOR CLIENT APPROVALS	2024.12.05
01	ISSUED FOR PLANNING APPROVALS	2024.09.17

THE GENERAL CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ALL ERRORS AND OMISSIONS TO THE ARCHITECT. DO NOT SCALE THE DRAWINGS. DO NOT USE THIS DRAWING FOR CONSTRUCTION UNLESS SIGNED AND SEALED BY THE ARCHITECT.

NORTH

STAMP

ONTARIO ASSOCIATION OF ARCHITECTS
RICHARD E ZIEGLER
LICENCE
4462

THE GATEWAY CENTRE

CHARIS DEVELOPMENTS
HIGHWAY 124 & POPLAR SIDE ROAD
COLLINGWOOD, ONTARIO

LEASING SITE PLAN - OPTION C4B

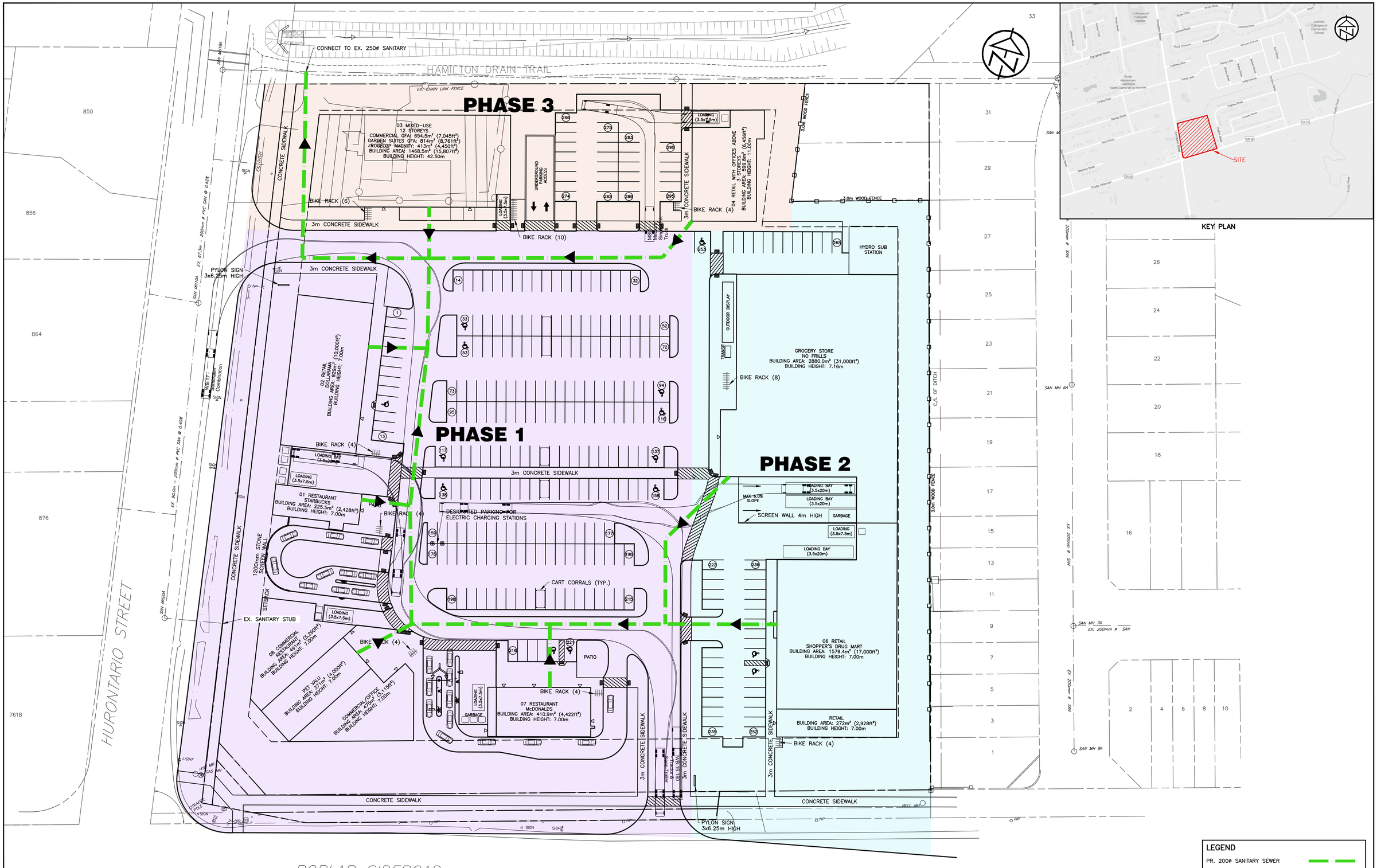
SCALE	As indicated	PROJECT NUMBER	202022
DATE	2025-05-09 9:18:20 AM		
DRAWN	SO		
CHECKED	REZ		
SHEET		REVISION	

A101-A

RICHARD ZIEGLER ARCHITECT INC.
39 POLSON STREET TORONTO, ONTARIO M5A 1A4
T: 416 461 1494 or 1 800 413 7992 F: 866 895 1488
www.rzorchitect.com E: mail @ rzorchitect.com

CHARIS DEVELOPMENTS
Built on Community Values

FILE NAME: V:\ 2020 Projects \ 202022 - Charis - The Gateway Centre \ 2.0 Design and Construction Documents Phase \ Revit \ Revit Planning Submission 2024.09.18 \ The Gateway Centre_Option C4B-5 - Rev 2025 2025.05.09.rvt
PLOT DATE: 2025-05-09 9:18:20 AM



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BENCHMARKS

ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO GEODETIC DATUM AND ARE DERIVED FROM BENCH MARK NO. 0011965U9504 HAVING A PUBLISHED ELEVATION OF 177.873 METRES.

NOTES

LEGAL SURVEY INFORMATION AND LOT DIMENSIONS SHOWN ON THIS PLAN ARE TAKEN FROM A SURVEY PLAN PREPARED BY J.D. BARNES LIMITED, DATED SEPTEMBER 22, 2021 WHICH MAY NOT BE FINAL AND ARE NOT GUARANTEED. THE FINAL REGISTERED PLAN OF SUBDIVISION SHALL BE REFERRED TO FOR CONFIRMATION OF THE DATA.

TOPOGRAPHIC INFORMATION SHOWN ON THIS PLAN FROM SURVEY PREPARED BY J.D. BARNES LIMITED DATED SEPTEMBER 22, 2021.

No.	REVISION DESCRIPTION	DATE
1.	FOR CIRCULATION	JUN 2025

ENGINEER STAMP

TOWN APPROVAL

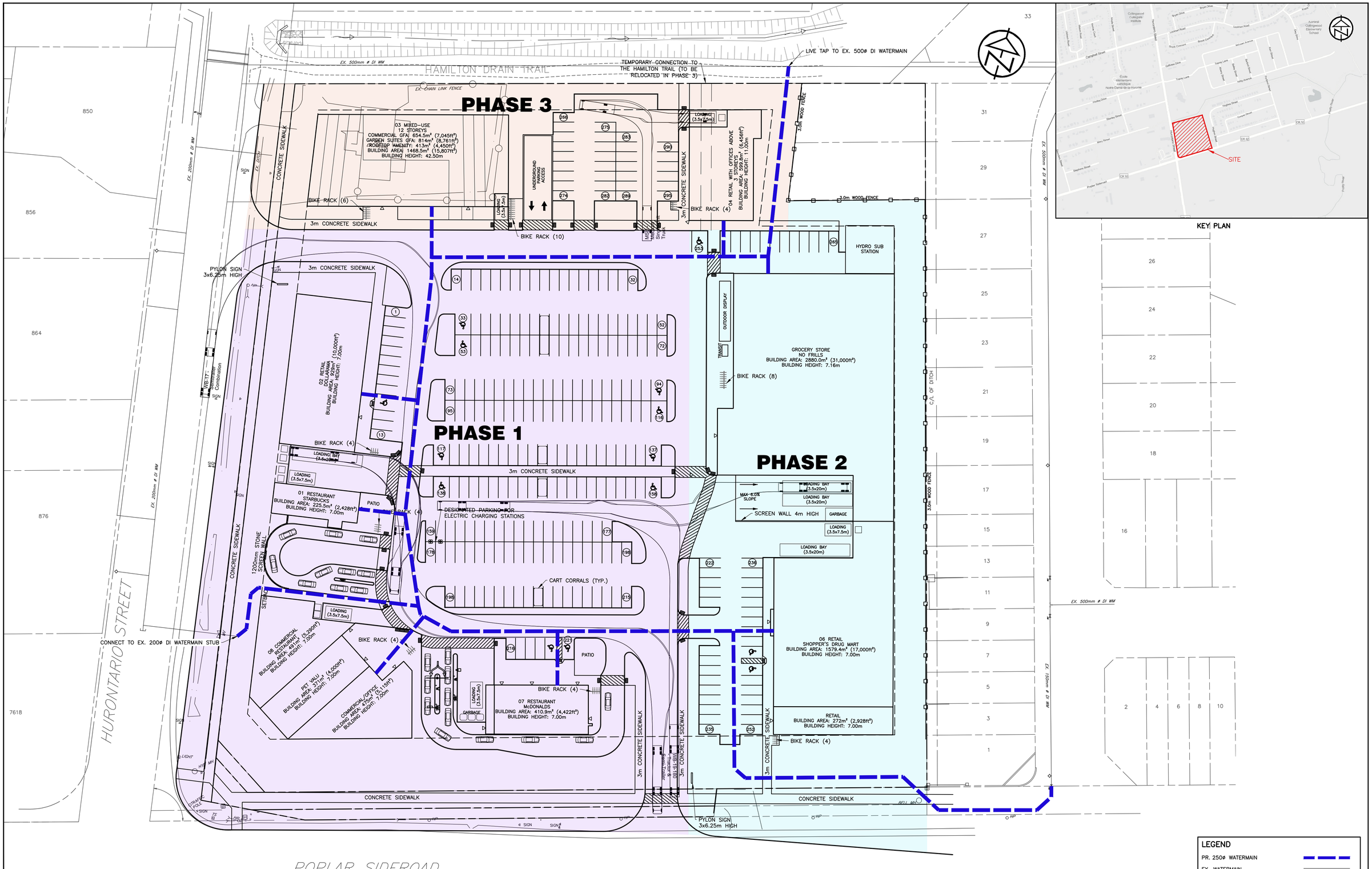
THE GATEWAY CENTRE
COLLINGWOOD, ON

TATHAM ENGINEERING

SANITARY LAYOUT PLAN

DESIGN: AS	FILE: 120119	DWG: SAN.1
DRAWN: KH	DATE: MAY 2025	
CHECK: JPA/RS	SCALE: 1:500	

Drawing Name: 120119-FSR FIGURES.dwg, Plotted: Jun 27, 2025



LEGEND

PR. 250ø WATERMAIN

EX. WATERMAIN

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BENCHMARKS

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TOPOGRAPHIC INFORMATION SHOWN ON THIS PLAN FROM SURVEY PREPARED BY J.D. BARNES LIMITED DATED SEPTEMBER 22, 2021.

No.	REVISION DESCRIPTION	DATE
1.	FOR CIRCULATION	JUN 2025

ENGINEER STAMP

TOWN APPROVAL

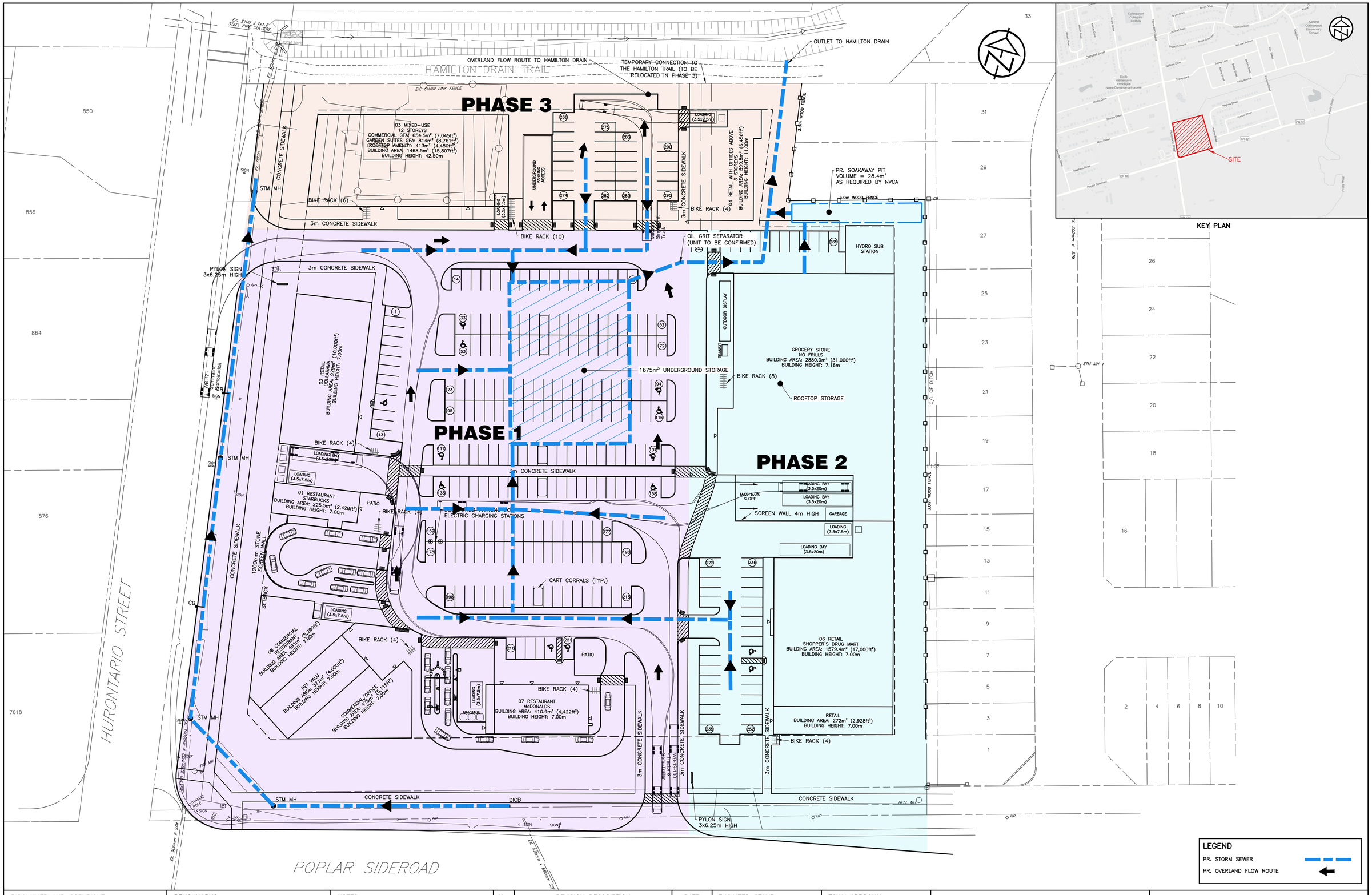
THE GATEWAY CENTRE
COLLINGWOOD, ON

TATHAM ENGINEERING

WATERMAIN LAYOUT PLAN

DESIGN: AS	FILE: 120119	DWG:	
DRAWN: KH	DATE: MAY 2025	**WAT.1**	
CHECK: JPA/RS	SCALE: 1:500		

Drawing Name: 120119-FSR FIGURES.dwg, Plotted: Jun 27, 2025



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BENCHMARKS

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No.	REVISION DESCRIPTION	DATE
1.	FOR CIRCULATION	JUN 2025

ENGINEER STAMP

TOWN APPROVAL

THE GATEWAY CENTRE
COLLINGWOOD, ON

TATHAM ENGINEERING

STORM LAYOUT PLAN

DESIGN: AS	FILE: 120119	DWG:	
DRAWN: KH	DATE: MAY 2025	**STM.1**	
CHECK: JPA/RS	SCALE: 1:500		

Drawing Name: 120119-FSR FIGURES.dwg, Plotted: Jun 27, 2025

Appendix A: Water Demand & Sanitary Calculations

TATHAM ENGINEERING	Project: The Gateway Village	Date: 8-Jul-25
	File No.: 120119	Designed: JB
	Subject: Water Demand and Sanitary Calculations	Checked: JN

Commercial Water Demand Calculations

PHASE 1

Building 1 - Starbucks

Donut Shop	400 L/d per seat - OBC Table 8.2.1.3.B. Item 12 e)			
157.0 m^2	400 L/d *	40 seats	=	**16,000 L/d**

Building 2 - Dollarama

Retail	5 L/d per m^2 of floor space - OBC Table 8.2.1.3.B. Item 22 a)			
836.1 m^2	5 L/d * 836.1 m^2		=	**4,181 L/d**

Building 7 - McDonalds

Paper Service Restaurant	60 L/d per seat - OBC Table 8.2.1.3.B. Item 12 a)			
287.0 m^2	60 L/d *	70 seats	=	**4,200 L/d**

Building 8

Restaurant	125 L/d per seat - OBC Table 8.2.1.3.B. Item 12 a)			
344.0 m^2	125 L/d *	70 seats	=	**8,750 L/d**
	AND			
Retail	5 L/d per m^2 of floor space - OBC Table 8.2.1.3.B. Item 22 a)			
334.3 m^2	5 L/d * 334.3 m^2		=	**1,672 L/d**
	AND			
Commercial/Office	5 L/d per m^2 of floor space - OBC Table 8.2.1.3.B. Item 22 a)			
427.8 m^2	5 L/d * 427.8 m^2		=	2,139 L/d
	OR			
	75 L/d per employee 8 hour shift - OBC Table 8.2.1.3.B. Item 15 a)			
	75 L/d *	45 shifts	=	3,375 L/d
	OR			
	75 L/d per 9.3 m^2 of floor space - OBC Table 8.2.1.3.B. Item 22 a)			
	75 L/d *	46 m^2	=	**3,450 L/d**

TOTAL PHASE 1 = 38,252 L/d

PHASE 2

Building 6:

Retail	5 L/d per m^2 of floor space - OBC Table 8.2.1.3.B. Item 22 a)			
1666 m^2	5 L/d * 1666 m^2		=	**8,330 L/d**

Building 5:

Grocery Store	40 L/d per 9.25m² of floor space - OBC Table 8.2.1.3.B. Item 12 j(i)			
1716 m^2	40 L/d * 1716 /9.25m² of floor space :			**7,421 L/d**
	AND			
Deli Department	190 L/d per 9.25m² of Deli Dept. floor space - OBC Table 8.2.1.3.B. Item 12 j(ii)			
100 m^2	190 L/d * 100 /9.25m² of floor space :			**2,054 L/d**
	AND			
Bakery Department	190 L/d per 9.25m² of Bakery Dept. floor space - OBC Table 8.2.1.3.B. Item 12 j(iii)			
100 m^2	190 L/d * 100 /9.25m² of floor space :			**2,054 L/d**
	AND			
Meat Department	380 L/d per 9.25m² of Meat Dept. floor space - OBC Table 8.2.1.3.B. Item 12 j(iv)			
100 m^2	380 L/d * 100 /9.25m² of floor space :			**4,108 L/d**
	AND			
	950 L/d per water closet - OBC Table 8.2.1.3.B. Item 12 j(v)			
	950 L/d *	4 water closets	=	**3,800 L/d**

TOTAL PHASE 2 = 27,767 L/d

PHASE 3

Building 3

Retail	5 L/d per m^2 of floor space - OBC Table 8.2.1.3.B. Item 22 a)			
589 m^2	5 L/d * 589 m^2		=	**2,945 L/d**

Building 4

Retail	5 L/d per m^2 of floor space - OBC Table 8.2.1.3.B. Item 22 a)			
540 m^2	5 L/d * 540 m^2		=	**2,699 L/d**
Office	75 L/d per employee 8 hour shift - OBC Table 8.2.1.3.B. Item 15 a)			
1080 m^2	75 L/d *	90 shifts	=	6,750 L/d
	OR			
	75 L/d per 9.3 m^2 of floor space - OBC Table 8.2.1.3.B. Item 15 b)			
	75 L/d *	116 m^2	=	**8,710 L/d**

TOTAL PHASE 3 = 14,354 L/d

TATHAM ENGINEERING	Project: The Gateway Village	Date: 8-Jul-25
	File No.: 120119	Designed: JB
	Subject: Water Demand and Sanitary Calculations	Checked: JN

Average Commercial Daily Demand

= **80,373 L/d**
= **80.4 m³/d** or **0.93 L/s**

Maximum Commercial Daily Demand

Maximum Commercial Daily Demand = Assumed maximum day factor (2.0) * Average Commercial Daily Demand
= 2.0 * 80,373 L/d = **160,745 L/d**
= **160.7 m³/d** or **1.86 L/s**

Peak Commercial Hour Demand

Peak Commercial Hour Demand = Assumed peak hour factor (3.0) * Average Commercial Daily Demand
= 3.0 * 80,373 L/d = **241,118 L/d**
= **241.1 m³/d** or **2.79 L/s**

SDU Equivalent Calculation in accordance with the ICBL Exemption and Process Report

SDU Equivalent = Average Commercial Daily Demand / 0.754
= 80.4 / 0.754 m³/d = **106.6 SDUs**

Public works has identified the following water servicing demand requirements based on dwelling type. The use of the metric SDU (Single Detached Unit) provides a common term of reference for quantifying water and wastewater system capacity relative to building type. Non-residential water servicing capacity demands will also be communicated in SDUs for consistency.

Dwelling Type	Average Demand (m³/unit/day)[1]	SDU Equivalents
Single Detached	0.754	1.00
Semi-detached	0.702	0.93
Townhouse	0.624	0.83
Apartment	0.494	0.66

This table demonstrates the greater servicing efficiencies on a unit basis associated with apartments, townhomes and semi-detached homes compared to single detached homes. For example: a 100 unit apartment building would require 66 SDU of servicing capacity whereas 100 single detached houses would require 100 SDU.

TATHAM ENGINEERING	Project: The Gateway Village	Date: 8-Jul-25
	File No.: 120119	Designed: JB
	Subject: Water Demand and Sanitary Calculations	Checked: DC

Residential Water Demand Calculations

Population Density & Design Flows

Population Density = 1.9 capita/unit - per Amendment to Town of Collingwood Development Standards (2007)
Design Flow = 260 L/capita/day - per Amendment to Town of Collingwood Development Standards (2007)

Building 3

Average Residential Daily Demand = Population Density * Design Flow * No. of Units
165 (2 bedroom units) = 1.9 capita/unit * 260 L/capita/day * 165 units = **81,510 L/d**
= **81.5 m^3/d** or **0.94 L/s**

Average Residential Daily Demand

= **81,510 L/d**
= **81.5 m^3/d** or **0.94 L/s**

Maximum Residential Daily Demand

Maximum Day Factor = 1.77 - per Amendment to Town of Collingwood Development Standards (2007)
Maximum Commercial Daily Demand = Max. Day Factor * Average Residential Daily Demand
= 1.77 * 81,510 L/d = **144,273 L/d**
= **144.3 m^3/d** or **1.67 L/s**

Peak Residential Hour Demand

Peak Hour Factor = 2.70 - per Amendment to Town of Collingwood Development Standards (2007)
Peak Residential Hour Demand = Peak Hour Factor * Average Residential Daily Demand
= 2.70 * 81,510 L/d = **220,077 L/d**
= **220.1 m^3/d** or **2.55 L/s**

SDU Equivalent Calculation in accordance with the ICBL Exemption and Process Report

SDU Equivalent = 0.660 * Total No. of Units
= 0.660 * 165 Units = **108.9 SDUs**

Commercial + Residential Water Demand

Average Daily Demand =	80.4	m^3/d	+	81.5	m^3/d	=	**161.9**	**m^3/d**	or	**1.87 L/s**
Maximum Daily Demand =	160.7	m^3/d	+	144.3	m^3/d	=	**305.0**	**m^3/d**	or	**3.53 L/s**
Peak Hour Demand =	241.1	m^3/d	+	220.1	m^3/d	=	**461.2**	**m^3/d**	or	**5.34 L/s**
SDU Equivalent =	106.6	SDU	+	108.9	SDU	=	**215.5**	**SDU**		

TATHAM ENGINEERING	Project: The Gateway Village	Date: 8-Jul-25
	File No.: 120119	Designed: JB
	Subject: Water Demand and Sanitary Calculations	Checked: DC

Sewage Generation Calculations

Infiltration

Infiltration Rate = 0.23 L/ha/s - per Town of Collingwood Development Standards (2007) Sec. 4.3.3.1
Site Area = 3.76 ha
Infiltration = Infiltration Rate * Site Area
= 0.23 L/ha/s * 3.76 ha = 0.86 L/s

Equivalent Population

Water Design Flow = 260 L/cap/day - per Amendment to Town of Collingwood Development Standards
Average Commercial Daily Flow = Average Commercial Daily Demand - Daily Irrigation Demand
= 80,373 L/day
Commercial Equivalent Population = 80,373 L/day ÷ 260 L/cap/day = 309.1 capita

Population Density = 1.9 capita/unit - per Amendment to Town of Collingwood Development Standards
Total No. of Units = 165 units
Residential Population = 1.90 capita/unit * 165 units = 313.5 capita

Equivalent Population = Commercial Population + Residential Population
= 309.1 capita + 313.5 capita = 622.6 capita

Harmon's Peaking Factor

Harmon's Peaking Factor = $1 + 14 \div (4 + \sqrt{[\text{Population}/1000]})$
= $1 + 14 \div (4 + \sqrt{[\ 622.6\ /1000]})$ = 3.92

Maximum Daily Flow

Average Daily Flow = 161.9 m^3/d = 1.87 L/s

Maximum Daily Flow = Harmon's Peaking Factor * Average Daily Demand + Infiltration
= 3.92 * 1.87 L/s + 0.86 L/s = **8.22 L/s** or **709.8 m^3/d**

Appendix B: Water & Sanitary Service Calculations

TATHAM ENGINEERING	**Project:**	The Gateway Centre
	File No.:	120119
	Date:	8-Jul-25
	Design:	JB
	Checked:	JN
	Revision:	4

BUILDING 1 - PHASE 1

Calculation of Water Flow Rates for Water Services

Hazen Williams Equation as used in this spreadsheet:

$Q = (3.763 \times 10^{-6})\ C\ D^{2.63}(DP/L)^{0.54}$

where Q is the water flow rate in m^3/hr
D is the pipe diameter in mm
L is the pipe length in m
DP is the pressure difference across pipe length L in kN/m^2

Pipe Material: Copper
Hazen Williams Coefficient, C = 140
Pressure drop over the pipe length, DP = 275 kN/m^2

Pipe Length (m)	Water Flow Rate (m^3/hr) Pipe Diameter (mm)									
	12	20	25	40	**50**	65	75	100	130	150
14	1.8	6.9	12.5	43.0	**77.3**	154.2	224.6	478.6	954.3	1390.3

Flow rate provided by 50 mm diameter water service

$Q_{provided}$ = 77.3 m^3/hr
$Q_{provided}$ = 21.48 L/s

Water Demand (from Water Demand and Sanitary Calculations)

Average Day Demand 16000 L/d
Peak Hour Factor 3.0
Peak Hour Demand, $Q_{required}$ = 0.56 L/s

$Q_{provided}$ =	21.48	L/s	>	$Q_{required}$ =	0.56	L/s	Acceptable

TATHAM ENGINEERING		
	Project:	The Gateway Centre
	File No.:	120119
	Date:	8-Jul-25
	Design:	JB
	Checked:	JN
	Revision:	4

BUILDING 1 - PHASE 1

Calculation of Sewage Flow Rates for Sanitary Services

Manning's Equation as used in this spreadsheet:

$Q = (A \cdot R^{2/3} \cdot S^{1/2})/n$

where Q is the water flow rate in m^3/s
A is the pipe area in m^2
R is the pipe hydraulic radius in m
S is the slope of the pipe
n is the Manning's Coefficient

Flow rate provided by 125 mm diameter sanitary service

Pipe Material:	PVC	
Manning's Coeff. =	0.013	
Slope =	0.01	m/m
Diameter =	0.125	m
Area =	0.012	m^2
Perimeter =	0.39	m
Hydraulic Radius =	0.03	m
Flow Rate, $Q_{provided}$ =	0.009	m^3/s
Flow Rate, $Q_{provided}$ =	9.37	L/s

Sanitary Loading

Average Day Flow =	16000	L/d =	0.19	L/s	(As per Water Demand Calculation)
Harmon's Peaking Factor =	3.9				(As per Town of Collingwood Standards)
Extraneuos Flow Criteria =	0.23	L/ha-s			(As per Town of Collingwood Standards)
Contribuiting Area =	0.36	ha			(Based on SAN.1 - Sanitary Layout Plan)
Extraneuos Flow =	0.08	L/s			

Required Flow, $Q_{required}$ = Av. Day Flow • Peak Factor + Extraneous Flow = 0.81 L/s

Check: $Q_{provided}$ = 9.37 L/s > $Q_{required}$ = 0.81 L/s Acceptable

TATHAM ENGINEERING	**Project:**	The Gateway Centre
	File No.:	120119
	Date:	8-Jul-25
	Design:	JB
	Checked:	AS
	Revision:	3

BUILDING 2 - PHASE 1

Calculation of Water Flow Rates for Water Services

Hazen Williams Equation as used in this spreadsheet:

$Q = (3.763 \times 10^{-6})\ C\ D^{2.63}(DP/L)^{0.54}$

where Q is the water flow rate in m^3/hr
D is the pipe diameter in mm
L is the pipe length in m
DP is the pressure difference across pipe length L in kN/m^2

Pipe Material: Copper
Hazen Williams Coefficient, C = 140
Pressure drop over the pipe length, DP = 275 kN/m^2

Pipe Length (m)	Water Flow Rate (m^3/hr) Pipe Diameter (mm)									
	12	20	25	40	**50**	65	75	100	130	150
17	1.6	6.3	11.2	38.7	**69.6**	138.8	202.2	431.0	859.3	1251.9

Flow rate provided by 50 mm diameter water service

$Q_{provided}$ = 69.6 m^3/hr
$Q_{provided}$ = 19.34 L/s

Water Demand (from Water Demand and Sanitary Calculations)

Average Day Demand 4181 L/d
Peak Hour Factor 3.0
Peak Hour Demand, $Q_{required}$ = 0.15 L/s

Check: $Q_{provided}$ = 19.34 L/s > $Q_{required}$ = 0.15 L/s Acceptable

TATHAM ENGINEERING	**Project:**	The Gateway Centre
	File No.:	120119
	Date:	8-Jul-25
	Design:	JB
	Checked:	AS
	Revision:	3

BUILDING 2 - PHASE 1

Calculation of Sewage Flow Rates for Sanitary Services

Manning's Equation as used in this spreadsheet:

$Q = (A \cdot R^{2/3} \cdot S^{1/2})/n$

where Q is the water flow rate in m^3/s
A is the pipe area in m^2
R is the pipe hydraulic radius in m
S is the slope of the pipe
n is the Manning's Coefficient

Flow rate provided by 125 mm diameter sanitary service

Pipe Material:	PVC	
Manning's Coeff. =	0.013	
Slope =	0.01	m/m
Diameter =	0.125	m
Area =	0.012	m^2
Perimeter =	0.39	m
Hydraulic Radius =	0.03	m
Flow Rate, $Q_{provided}$ =	0.009	m^3/s
Flow Rate, $Q_{provided}$ =	9.37	L/s

Sanitary Loading

Average Day Flow =	4181	L/d =	0.05	L/s	(As per Water Demand Calculation)
Harmon's Peaking Factor =	3.9				(As per Town of Collingwood Standards)
Extraneuos Flow Criteria =	0.23	L/ha-s			(As per Town of Collingwood Standards)
Contribuiting Area =	0.75	ha			(Based on SAN.1 - Sanitary Layout Plan)
Extraneuos Flow =	0.17	L/s			

Required Flow, $Q_{required}$ = Av. Day Flow • Peak Factor + Extraneous Flow = 0.36 L/s

Check: $Q_{provided}$ = 9.37 L/s > $Q_{required}$ = 0.36 L/s Acceptable

TATHAM ENGINEERING	**Project:**	The Gateway Centre
	File No.:	120119
	Date:	8-Jul-25
	Design:	JB
	Checked:	AS
	Revision:	3

BUILDING 7 - PHASE 1

Calculation of Water Flow Rates for Water Services

Hazen Williams Equation as used in this spreadsheet:

$Q = (3.763 \times 10^{-6})\ C\ D^{2.63}(DP/L)^{0.54}$

where Q is the water flow rate in m^3/hr
D is the pipe diameter in mm
L is the pipe length in m
DP is the pressure difference across pipe length L in kN/m^2

Pipe Material: Copper
Hazen Williams Coefficient, C = 140
Pressure drop over the pipe length, DP = 275 kN/m^2

Pipe Length (m)	Water Flow Rate (m^3/hr) Pipe Diameter (mm)									
	12	20	25	40	**50**	65	75	100	130	150
16	1.7	6.5	11.6	40.0	**71.9**	143.4	209.0	445.3	887.9	1293.6

Flow rate provided by 50 mm diameter water service

$Q_{provided}$ = 71.9 m^3/hr
$Q_{provided}$ = 19.98 L/s

Water Demand (from Water Demand and Sanitary Calculations)

Average Day Demand 4200 L/d
Peak Hour Factor 3.0
Peak Hour Demand, $Q_{required}$ = 0.15 L/s

$Q_{provided}$ =	19.98	L/s	>	$Q_{required}$ =	0.15	L/s	Acceptable

TATHAM ENGINEERING	**Project:**	The Gateway Centre
	File No.:	120119
	Date:	8-Jul-25
	Design:	JB
	Checked:	AS
	Revision:	3

BUILDING 7 - PHASE 1

Calculation of Sewage Flow Rates for Sanitary Services

Manning's Equation as used in this spreadsheet:

$Q = (A \cdot R^{2/3} \cdot S^{1/2})/n$

where Q is the water flow rate in m^3/s
A is the pipe area in m^2
R is the pipe hydraulic radius in m
S is the slope of the pipe
n is the Manning's Coefficient

Flow rate provided by 125 mm diameter sanitary service

Pipe Material:	PVC	
Manning's Coeff. =	0.013	
Slope =	0.01	m/m
Diameter =	0.125	m
Area =	0.012	m^2
Perimeter =	0.39	m
Hydraulic Radius =	0.03	m
Flow Rate, $Q_{provided}$ =	0.009	m^3/s
Flow Rate, $Q_{provided}$ =	9.37	L/s

Sanitary Loading

Average Day Flow =	4200	L/d =	0.05	L/s	(As per Water Demand Calculation)
Harmon's Peaking Factor =	3.9				(As per Town of Collingwood Standards)
Extraneuos Flow Criteria =	0.23	L/ha-s			(As per Town of Collingwood Standards)
Contribuiting Area =	0.63	ha			(Based on SAN.1 - Sanitary Layout Plan)
Extraneuos Flow =	0.14	L/s			

Required Flow, $Q_{required}$ = Av. Day Flow • Peak Factor + Extraneous Flow = 0.34 L/s

Check: $Q_{provided}$ = 9.37 L/s > $Q_{required}$ = 0.34 L/s Acceptable

TATHAM ENGINEERING	**Project:**	The Gateway Centre
	File No.:	120119
	Date:	8-Jul-25
	Design:	JB
	Checked:	AS
	Revision:	3

BUILDING 8 - PHASE 1

Calculation of Water Flow Rates for Water Services

Hazen Williams Equation as used in this spreadsheet:

$Q = (3.763 \times 10^{-6})\ C\ D^{2.63}(DP/L)^{0.54}$

where Q is the water flow rate in m^3/hr
D is the pipe diameter in mm
L is the pipe length in m
DP is the pressure difference across pipe length L in kN/m^2

Pipe Material: Copper
Hazen Williams Coefficient, C = 140
Pressure drop over the pipe length, DP = 275 kN/m^2

Pipe Length (m)	Water Flow Rate (m^3/hr) Pipe Diameter (mm)									
	12	20	25	40	**50**	65	75	100	130	150
22	1.4	5.4	9.8	33.7	**60.6**	120.8	176.0	375.0	747.6	1089.2

Flow rate provided by 50 mm diameter water service

$Q_{provided}$ = 60.6 m^3/hr
$Q_{provided}$ = 16.83 L/s

Water Demand (from Water Demand and Sanitary Calculations)

Average Day Demand = 8750 L/d + 1672 L/d + 3450 L/d
Average Day Demand 13872 L/d
Peak Hour Factor 3.0
Peak Hour Demand, $Q_{required}$ = 0.48 L/s

$Q_{provided}$ =	16.83	L/s	>	$Q_{required}$ =	0.48	L/s	Acceptable

TATHAM ENGINEERING	**Project:**	The Gateway Centre
	File No.:	120119
	Date:	8-Jul-25
	Design:	JB
	Checked:	AS
	Revision:	3

BUILDING 8 - PHASE 1

Calculation of Sewage Flow Rates for Sanitary Services

Manning's Equation as used in this spreadsheet:

$Q = (A \cdot R^{2/3} \cdot S^{1/2})/n$

where Q is the water flow rate in m^3/s
A is the pipe area in m^2
R is the pipe hydraulic radius in m
S is the slope of the pipe
n is the Manning's Coefficient

Flow rate provided by 125 mm diameter sanitary service

Pipe Material:	PVC	
Manning's Coeff. =	0.013	
Slope =	0.01	m/m
Diameter =	0.125	m
Area =	0.012	m^2
Perimeter =	0.39	m
Hydraulic Radius =	0.03	m
Flow Rate, $Q_{provided}$ =	0.009	m^3/s
Flow Rate, $Q_{provided}$ =	9.37	L/s

Sanitary Loading

Average Day Flow =	13872	L/d =	0.16	L/s	(As per Water Demand Calculation)
Harmon's Peaking Factor =	3.9				(As per Town of Collingwood Standards)
Extraneuos Flow Criteria =	0.23	L/ha-s			(As per Town of Collingwood Standards)
Contribuiting Area =	0.30	ha			(Based on SAN.1 - Sanitary Layout Plan)
Extraneuos Flow =	0.07	L/s			

Required Flow, $Q_{required}$ = Av. Day Flow • Peak Factor + Extraneous Flow = 0.70 L/s

Check:	**$Q_{provided}$ =**	**9.37**	**L/s**	**>**	**$Q_{required}$ =**	**0.70**	**L/s**	**Acceptable**

TATHAM ENGINEERING	**Project:**	The Gateway Centre
	File No.:	120119
	Date:	8-Jul-25
	Design:	JB
	Checked:	AS
	Revision:	3

PHASE 2 - Grocery Building

Calculation of Water Flow Rates for Water Services

Hazen Williams Equation as used in this spreadsheet:

$Q = (3.763 \times 10^{-6})\ C\ D^{2.63}(DP/L)^{0.54}$

where Q is the water flow rate in m^3/hr
D is the pipe diameter in mm
L is the pipe length in m
DP is the pressure difference across pipe length L in kN/m^2

Pipe Material: Copper
Hazen Williams Coefficient, C = 140
Pressure drop over the pipe length, DP = 275 kN/m^2

Pipe Length (m)	Water Flow Rate (m^3/hr) Pipe Diameter (mm)									
	12	20	25	40	50	65	75	100	130	**150**
6	2.9	11.0	19.7	67.9	122.2	243.6	354.9	756.3	1507.9	**2197.0**

Flow rate provided by 150 mm diameter water service

$Q_{provided}$ = 2197.0 m^3/hr
$Q_{provided}$ = 610.26 L/s

Water Demand (from Water Demand and Sanitary Calculations)

Average Day Demand = 7421 L/d + 2054 L/d + 2054 L/d + 4108 L/d
+ 3800 L/d
Average Day Demand 19437 L/d
Peak Hour Factor 3.0
Peak Hour Demand, $Q_{required}$ = 0.67 L/s

$Q_{provided}$ =	610.26	L/s	>	$Q_{required}$ =	0.67	L/s	Acceptable

TATHAM ENGINEERING	**Project:**	The Gateway Centre
	File No.:	120119
	Date:	8-Jul-25
	Design:	JB
	Checked:	AS
	Revision:	3

PHASE 2 - Grocery Building

Calculation of Sewage Flow Rates for Sanitary Services

Manning's Equation as used in this spreadsheet:

$Q = (A \cdot R^{2/3} \cdot S^{1/2})/n$

where Q is the water flow rate in m^3/s
A is the pipe area in m^2
R is the pipe hydraulic radius in m
S is the slope of the pipe
n is the Manning's Coefficient

Flow rate provided by 125 mm diameter sanitary service

Pipe Material:	PVC	
Manning's Coeff. =	0.013	
Slope =	0.01	m/m
Diameter =	0.125	m
Area =	0.012	m^2
Perimeter =	0.39	m
Hydraulic Radius =	0.03	m
Flow Rate, $Q_{provided}$ =	0.009	m^3/s
Flow Rate, $Q_{provided}$ =	9.37	L/s

Sanitary Loading

Average Day Flow =	19437	L/d =	0.22	L/s	(As per Water Demand Calculation)
Harmon's Peaking Factor =	3.9				(As per Town of Collingwood Standards)
Extraneuos Flow Criteria =	0.23	L/ha-s			(As per Town of Collingwood Standards)
Contribuiting Area =	0.75	ha			(Based on SAN.1 - Sanitary Layout Plan)
Extraneuos Flow =	0.17	L/s			

Required Flow, $Q_{required}$ = Max. Daily Flow • Peak Factor + Extraneous Flow = 1.06 L/s

Check: $Q_{provided}$ = 9.37 L/s > $Q_{required}$ = 1.06 L/s Acceptable

TATHAM ENGINEERING	**Project:**	The Gateway Centre
	File No.:	120119
	Date:	8-Jul-25
	Design:	JB
	Checked:	AS
	Revision:	3

PHASE 2 - Building 6

Calculation of Water Flow Rates for Water Services

Hazen Williams Equation as used in this spreadsheet:

$Q = (3.763 \times 10^{-6})\ C\ D^{2.63}(DP/L)^{0.54}$

where Q is the water flow rate in m^3/hr
D is the pipe diameter in mm
L is the pipe length in m
DP is the pressure difference across pipe length L in kN/m^2

Pipe Material: Copper
Hazen Williams Coefficient, C = 140
Pressure drop over the pipe length, DP = 275 kN/m^2

Pipe Length (m)	Water Flow Rate (m^3/hr) Pipe Diameter (mm)									
	12	20	25	40	**50**	65	75	100	130	150
12	2.0	7.5	13.6	46.7	**84.0**	167.5	244.1	520.2	1037.1	1511.0

Flow rate provided by 50 mm diameter water service

$Q_{provided}$ = 84.0 m^3/hr
$Q_{provided}$ = 23.34 L/s

Water Demand (from Water Demand and Sanitary Calculations)

Average Day Demand 8330 L/d
Peak Hour Factor 3.0
Peak Hour Demand, $Q_{required}$ = 0.29 L/s

$Q_{provided}$ =	12.00	L/s	>	$Q_{required}$ =	0.29	L/s	Acceptable

TATHAM ENGINEERING	**Project:**	The Gateway Centre
	File No.:	120119
	Date:	8-Jul-25
	Design:	JB
	Checked:	AS
	Revision:	3

PHASE 2 - Building 6

Calculation of Sewage Flow Rates for Sanitary Services

Manning's Equation as used in this spreadsheet:

$Q = (A \cdot R^{2/3} \cdot S^{1/2})/n$

where Q is the water flow rate in m^3/s
A is the pipe area in m^2
R is the pipe hydraulic radius in m
S is the slope of the pipe
n is the Manning's Coefficient

Flow rate provided by 125 mm diameter sanitary service

Pipe Material:	PVC	
Manning's Coeff. =	0.013	
Slope =	0.01	m/m
Diameter =	0.125	m
Area =	0.012	m^2
Perimeter =	0.39	m
Hydraulic Radius =	0.03	m
Flow Rate, $Q_{provided}$ =	0.009	m^3/s
Flow Rate, $Q_{provided}$ =	9.37	L/s

Sanitary Loading

Average Day Flow =	8330	L/d =	0.10	L/s	(As per Water Demand Calculation)
Harmon's Peaking Factor =	3.9				(As per Town of Collingwood Standards)
Extraneuos Flow Criteria =	0.23	L/ha-s			(As per Town of Collingwood Standards)
Contribuiting Area =	0.75	ha			(Based on SAN.1 - Sanitary Layout Plan)
Extraneuos Flow =	0.17	L/s			

Required Flow, $Q_{required}$ = Max. Daily Flow • Peak Factor + Extraneous Flow = 0.55 L/s

Check: $Q_{provided}$ = 9.37 L/s > $Q_{required}$ = 0.55 L/s Acceptable

TATHAM ENGINEERING	**Project:**	The Gateway Centre
	File No.:	120119
	Date:	8-Jul-25
	Design:	JB
	Checked:	AS
	Revision:	3

BUILDING 3 - PHASE 3

Calculation of Water Flow Rates for Water Services

Hazen Williams Equation as used in this spreadsheet:

$Q = (3.763 \times 10^{-6})\ C\ D^{2.63}(DP/L)^{0.54}$

where Q is the water flow rate in m^3/hr
D is the pipe diameter in mm
L is the pipe length in m
DP is the pressure difference across pipe length L in kN/m^2

Pipe Material: Copper
Hazen Williams Coefficient, C = 140
Pressure drop over the pipe length, DP = 275 kN/m^2

Pipe Length (m)	Water Flow Rate (m^3/hr) Pipe Diameter (mm)									
	12	20	25	40	50	65	75	100	130	**150**
15	1.7	6.7	12.0	41.4	74.5	148.5	216.4	461.1	919.4	**1339.5**

Flow rate provided by 150 mm diameter water service

$Q_{provided}$ = 1339.5 m^3/hr
$Q_{provided}$ = 372.07 L/s

Water Demand (from Water Demand and Sanitary Calculations)

	Commercial		Residential	
Average Day Demand	2945	L/d	81510	L/d
Peak Hour Factor	3.0		2.7	
Peak Hour Demand=	0.10	L/s	2.55	L/s
Total Peak Hour Demand, $Q_{required}$ =	**2.65**			

Check:	**$Q_{provided}$ =**	**372.07**	**L/s**	**>**	**$Q_{required}$ =**	**2.65**	**L/s**	**Acceptable**

TATHAM ENGINEERING	**Project:**	The Gateway Centre
	File No.:	120119
	Date:	8-Jul-25
	Design:	JB
	Checked:	AS
	Revision:	3

BUILDING 3 - PHASE 3

Calculation of Sewage Flow Rates for Sanitary Services

Manning's Equation as used in this spreadsheet:

$Q = (A \cdot R^{2/3} \cdot S^{1/2})/n$

where Q is the water flow rate in m^3/s
A is the pipe area in m^2
R is the pipe hydraulic radius in m
S is the slope of the pipe
n is the Manning's Coefficient

Flow rate provided by 125 mm diameter sanitary service

Pipe Material:	PVC	
Manning's Coeff. =	0.013	
Slope =	0.01	m/m
Diameter =	0.125	m
Area =	0.012	m^2
Perimeter =	0.39	m
Hydraulic Radius =	0.03	m
Flow Rate, $Q_{provided}$ =	0.009	m^3/s
Flow Rate, $Q_{provided}$ =	9.37	L/s

Sanitary Loading

Average Day Flow =	84455	L/d =	0.98	L/s	(As per Water Demand Calculation)
Harmon's Peaking Factor =	3.9				(As per Town of Collingwood Standards)
Extraneuos Flow Criteria =	0.23	L/ha-s			(As per Town of Collingwood Standards)
Contribuiting Area =	0.38	ha			(Based on SAN.1 - Sanitary Layout Plan)
Extraneuos Flow =	0.09	L/s			

Required Flow, $Q_{required}$ = Av. Day Flow • Peak Factor + Extraneous Flow = 3.93 L/s

Check: $Q_{provided}$ = 9.37 L/s > $Q_{required}$ = 3.93 L/s Acceptable

TATHAM ENGINEERING	**Project:**	The Gateway Centre
	File No.:	120119
	Date:	8-Jul-25
	Design:	JB
	Checked:	AS
	Revision:	3

BUILDING 4 - PHASE 3

Calculation of Water Flow Rates for Water Services

Hazen Williams Equation as used in this spreadsheet:

$Q = (3.763 \times 10^{-6})\ C\ D^{2.63}(DP/L)^{0.54}$

where Q is the water flow rate in m^3/hr
D is the pipe diameter in mm
L is the pipe length in m
DP is the pressure difference across pipe length L in kN/m^2

Pipe Material: Copper
Hazen Williams Coefficient, C = 140
Pressure drop over the pipe length, DP = 275 kN/m^2

Pipe Length (m)	Water Flow Rate (m^3/hr) Pipe Diameter (mm)									
	12	20	25	40	**50**	65	75	100	130	150
11	2.1	7.9	14.2	49.0	**88.1**	175.6	255.8	545.2	1087.0	1583.7

Flow rate provided by 50 mm diameter water service

$Q_{provided}$ = 88.1 m^3/hr
$Q_{provided}$ = 24.46 L/s

Water Demand (from Water Demand and Sanitary Calculations)

Average Day Demand = 2699 L/d + 8710 L/d
Average Day Demand 11409 L/d
Peak Hour Factor 3.0
Peak Hour Demand, $Q_{required}$ = 0.40 L/s

Check: $Q_{provided}$ = 24.46 L/s > $Q_{required}$ = 0.40 L/s Acceptable

TATHAM ENGINEERING	**Project:**	The Gateway Centre
	File No.:	120119
	Date:	8-Jul-25
	Design:	JB
	Checked:	AS
	Revision:	3

BUILDING 4 - PHASE 3

Calculation of Sewage Flow Rates for Sanitary Services

Manning's Equation as used in this spreadsheet:

$Q = (A \cdot R^{2/3} \cdot S^{1/2})/n$

where Q is the water flow rate in m^3/s
A is the pipe area in m^2
R is the pipe hydraulic radius in m
S is the slope of the pipe
n is the Manning's Coefficient

Flow rate provided by 125 mm diameter sanitary service

Pipe Material:	PVC	
Manning's Coeff. =	0.013	
Slope =	0.01	m/m
Diameter =	0.125	m
Area =	0.012	m^2
Perimeter =	0.39	m
Hydraulic Radius =	0.03	m
Flow Rate, $Q_{provided}$ =	0.009	m^3/s
Flow Rate, $Q_{provided}$ =	9.37	L/s

Sanitary Loading

Maximum Daily Flow =	11409	L/d =	0.13	L/s	(As per Water Demand Calculation)
Harmon's Peaking Factor =	3.9				(As per Town of Collingwood Standards)
Extraneuos Flow Criteria =	0.23	L/ha-s			(As per Town of Collingwood Standards)
Contribuiting Area =	0.21	ha			(Based on SAN.1 - Sanitary Layout Plan)
Extraneuos Flow =	0.05	L/s			

Required Flow, $Q_{required}$ = Av. Day Flow • Peak Factor + Extraneous Flow = 0.57 L/s

Check: $Q_{provided}$ = 9.37 L/s > $Q_{required}$ = 0.57 L/s Acceptable

TATHAM ENGINEERING

Project:	The Gateway Centre
File No.:	120119
Date:	8-Jul-25
Design:	JB
Checked:	AS
Revision:	3

SITE - MAIN WATERMAIN

Calculation of Water Flow Rates for Different Pipe Sizes
(Hazen Williams Formula - S.I. units)

Pipe Material: Ductile Iron Hazen Williams Coefficient, **C** = 150

Pressure drop over the pipe length, DP = 275 kN/m^2

Pipe Length (m)	Water Flow Rate (m^3/hr) Pipe Diameter (mm)									
	12	20	25	40	50	75	100	130	150	**250**
332	0.4	1.3	2.4	8.3	15.0	43.5	92.8	185.0	269.5	**1032.8**

Flow rate provided by 250 mm dia. water service	=	1032.8	m^3/hr
	=	**286.90**	**L/s**
Water Demand (from Water Demand and Sanitary Calculations)			
Commercial			
Average Day Demand	=	80373	L/d
Maximum Day Factor	=	2.0	
Maximum Day Demand	**=**	**1.86**	**L/s**
Residential			
Average Day Demand	=	81510	L/d
Maximum Day Factor	=	1.8	
Maximum Day Demand	**=**	**1.67**	**L/s**
Total Maximum Day Demand	**=**	**3.53**	**L/s**
Total Fire Flow Demand	**=**	**183**	**L/s**
Total Demand (MDD +FF)	**=**	**186.86**	**L/s**

Hazen Williams Equation as used in this spreadsheet:

$$Q = (3.763 \times 10^{-6})\ C\ D^{2.63}(DP/L)^{0.54}$$

where Q is the water flow rate in m^3/hr
D is the pipe diameter in mm
L is the pipe length in m
DP is the pressure difference across pipe length L in kN/m^2

Appendix C:
FUS Fire Flow Calculations

Project:	The Gateway Centre - Building 1	Date:	September 16, 2024
File No.:	120119	Designed:	JB
Subject:	Fire Flow Calculations	Checked	AS
Revisions:			

BUILDING 1

Fire Underwriters Survey Fire Flow Calculations
Long Method

Calculation Based on 1999 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	**Framing Material**						
		Coefficient related to type of construction (C)	Wood Frame	1.5	Ordinary Construction	**1**	-	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 Occupancy	**Floor Space Area**						
		Type of Occupancy	Single Family	1			Units	N/A
			Townhouse / Apartment- inform # of units	1				
			Other (Comm. Ind., etc.)	1		**1**		
2.1	Number of Storeys	Number of Floors / Storeys in the unit (do not include basement)				**1**	Storeys	N/A
3	Floor Area	Total Floor Area (A) - for all storeys excluding basement			m^2	157	m^2	N/A
		Measurement Units	Square Feet (ft2)	0.093	1	**157**		
			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	3,000
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	Combustible	0.00	N/A	3000
			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	Complete automatic sprinkler protection	-0.3	None	0.00	N/A	0
			Standard hoses for both system & Fire Department	-0.10				
			Surpervised system	-0.1				
5.3	Separation Distance Between Units	Exposure distance between units	North Side	3.1-10	0.20	0.20	N/A	600
			East Side	>30	0.00			
			South Side	>30	0.00			
			West Side	>30	0.00			
Total Required Fire Flow, rounded to nearest 1000 L/min, with max/min limits applied:								4000
6	Required Fire Flow, Duration and Volume	Total Required Fire Flow (above) in L/s:						67
		Required Duration of Fire Flow of 4,000 L/min (hrs):						2
		Required Volume for Fire Flow of 4,000 L/min (m^3):						480

Project:	The Gateway Centre - Building 2	Date:	September 16, 2024
File No.:	120119	Designed:	JB
Subject:	Fire Flow Calculations	Checked	AS
Revisions:			

BUILDING 2

Fire Underwriters Survey Fire Flow Calculations
Long Method

Calculation Based on 1999 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)
		Framing Material						
1	Frame Use for Construction of Unit	Coefficient related to type of construction (C)	Wood Frame	1.5	Ordinary Construction	**1**	-	N/A
			Ordinary Construction	1				
			Non-combustible construction	0.8				
			Fire resistive construction (< 2 hrs)	0.7				
			Fire resistive construction (> 2 hrs)	0.6				
		Floor Space Area						
2	Type of Occupancy	Type of Occupancy	Single Family	1			Units	N/A
			Townhouse / Apartment- inform # of units	1				
			Other (Comm. Ind., etc.)	1		**1**		
2.1	Number of Storeys	Number of Floors / Storeys in the unit (do not include basement)				**1**	Storeys	N/A
3	Floor Area	Total Floor Area (A) - for all storeys excluding basement			m^2	836	m^2	N/A
		Measurement Units	Square Feet (ft2)	0.093	1	**836**		
			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): ($FF = 220 \times C \times A^{0.5}$)					L/min	6,000
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	Free burning	0.15	N/A	6900
			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	Complete automatic sprinkler protection	-0.3	None	0.00	N/A	0
			Standard hoses for both system & Fire Department	-0.10				
			Surpervised system	-0.1				
5.3	Separation Distance Between Units	Exposure distance between units	North Side	20.1-30	0.10	0.30	N/A	2070
			East Side	>30	0.00			
			South Side	3.1-10	0.20			
			West Side	>30	0.00			
Total Required Fire Flow, rounded to nearest 1000 L/min, with max/min limits applied:								9000
6	Required Fire Flow, Duration and Volume	Total Required Fire Flow (above) in L/s:						150
		Required Duration of Fire Flow of 9,000 L/min (hrs):						2
		Required Volume for Fire Flow of 9,000 L/min (m^3):						1,080

TATHAM ENGINEERING	Project: The Gateway Centre - Building 3	Date:	July 8, 2025
	File No.: 120119	Designed:	JB
	Subject: Fire Flow Calculations	Checked	AS
	Revisions:		

Fire Underwriters Survey 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	**Framing Material**							
		Coefficient related to type of construction (C)	Type V - Wood Frame Construction	1.5	Non-combustible Construction	**0.8**	%	N/A	
			Type IVA - Mass Timber Construction	0.8					
			Type IVB - Mass Timber Construction	0.9					
			Type IVC - Mass Timber Construction	1.0					
			Type IVD - Mass Timber Construction	1.5					
			Ordinary Construction	1.0					
			Non-combustible Construction	0.8					
			Fire Resistive Construction	0.6					
2	Total Effective Area	Largest Floor Area				**1403**	m^2	N/A	
		Percentage of the Total Area of the Other Floors for Coefficient 1.0 to 1.5			**100%**				
		Percentage of the Total Area of the Other Floors for Coefficient below 1.0:							
		a) If any vertical opening in the building are unprotected, consider the two largest adjoining floor areas plus 50% of all floors immediately above them up to a maximum of eight, **or**			**50%**	**4070**			
		b) If all vertical openings and exterior vertical communications are properly protected in accordance with the National Building Code, consider only the single largest Floor Area plus 25% of each of the two immediately adjoining floors.			**25%**				
		Total Effective Area				**5473**			
3	Required Fire Flow without Reductions or Increases	Required Fire Flows without Reductions or Increases per FUS): (RFF= 220 x C x $A^{0.5}$)						13,000	
4	Factors Affecting Burning	**Reductions / Increases Due to Factors Affecting Burning**							
4.1	Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	%	(1,950)	11,050
			Limited combustible	-0.15					
			Combustible	0.00					
			Free burning	0.15					
			Rapid burning	0.25					
4.2	Reduction Due to Presence of Sprinklers	Sprinkler reduction	For a fully supervised system the conditions a), b) and c) below must be met.			-0.3	%	(3,315)	7,735
			a) Automatic sprinkler protection designed and installed in accordance with NFPA 13	-0.3	Yes				
			b) Water supply is standard for both the system and the Fire Department hose lines	-0.1	No				
			c) Fully supervised system	-0.1	No				
			None	0.0	No				
4.3	Separation Distance Between Units (Use 10% for 2 hour Fire Separation between adjacent units)	Exposure distance between units	North Side	Greater than 30.0 m	0.00	0.1	%	1,105	8,840
			East Side	Greater than 30.0 m	0.00				
			South Side	20.1 to 30.0 m	0.10				
			West Side	Greater than 30.0 m	0.00				
4.4	Combustibility of Wood Shingle or Shake Roof Material	Surcharge for potential to spread fire	Non-combustible roofing material	0	Non-combustible roofing material	0	L/min	0	8,840
			Low risk of fire spread	2000					
			Moderate risk of fire spread	3000					
			High risk of fire spread	4000					
		Total Required Fire Flow, rounded to nearest 1000 L/min, with max/min limits applied:							9,000
5	Required Fire Flow, Duration and Volume	Total Required Fire Flow (above) in L/s:						150	
		Required Duration of Fire Flow of 9,000 L/min (hrs):						3	
		Required volume for Fire Flow of 9,000 L/min (m^3):						1,620	

Project:	The Gateway Centre - Building 4	Date:	September 16, 2024
File No.:	120119	Designed:	JB
Subject:	Fire Flow Calculations	Checked	AS
Revisions:			

BUILDING 4

Fire Underwriters Survey Fire Flow Calculations
Long Method

Calculation Based on 1999 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)
		Framing Material						
1	Frame Use for Construction of Unit	Coefficient related to type of construction (C)	Wood Frame	1.5	Ordinary Construction	**1**	-	N/A
			Ordinary Construction	1				
			Non-combustible construction	0.8				
			Fire resistive construction (< 2 hrs)	0.7				
			Fire resistive construction (> 2 hrs)	0.6				
		Floor Space Area						
2	Type of Occupancy	Type of Occupancy	Single Family	1			Units	N/A
			Townhouse / Apartment- inform # of units	1				
			Other (Comm. Ind., etc.)	1		**1**		
2.1	Number of Storeys	Number of Floors / Storeys in the unit (do not include basement)				**3**	Storeys	N/A
3	Floor Area	Total Floor Area (A) - for all storeys excluding basement			m^2	1620	m^2	N/A
		Measurement Units	Square Feet (ft2)	0.093	1	**1620**		
			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	9,000
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	Limited	-0.15	N/A	7650
			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	Complete automatic sprinkler protection	-0.3	Complete automatic sprinkler protection	-0.30	N/A	-2295
			Standard hoses for both system & Fire Department	-0.10				
			Surpervised system	-0.1				
5.3	Separation Distance Between Units	Exposure distance between units	North Side	>30	0.00	0.10	N/A	765
			East Side	>30	0.00			
			South Side	20.1-30	0.10			
			West Side	>30	0.00			
Total Required Fire Flow, rounded to nearest 1000 L/min, with max/min limits applied:								6000
6	Required Fire Flow, Duration and Volume	Total Required Fire Flow (above) in L/s:						100
		Required Duration of Fire Flow of 6,000 L/min (hrs):						2
		Required Volume for Fire Flow of 6,000 L/min (m^3):						720

TATHAM ENGINEERING	Project:	The Gateway Centre - Grocery Store	Date: July 8, 2025
	File No.:	120119	Designed: JB
	Subject:	Fire Flow Calculations	Checked AS
	Revisions:		

Fire Underwriters Survey 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	**Framing Material**							
		Coefficient related to type of construction (C)	Type V - Wood Frame Construction	1.5	Ordinary Construction	**1.0**	%	N/A	
			Type IVA - Mass Timber Construction	0.8					
			Type IVB - Mass Timber Construction	0.9					
			Type IVC - Mass Timber Construction	1.0					
			Type IVD - Mass Timber Construction	1.5					
			Ordinary Construction	1.0					
			Non-combustible Construction	0.8					
			Fire Resistive Construction	0.6					
2	Total Effective Area	Largest Floor Area				**2016**	m^2	N/A	
		Percentage of the Total Area of the Other Floors for Coefficient 1.0 to 1.5			**0%**	**0**			
		Percentage of the Total Area of the Other Floors for Coefficient below 1.0:							
		a) If any vertical opening in the building are unprotected, consider the two largest adjoining floor areas plus 50% of all floors immediately above them up to a maximum of eight, **or**			**50%**				
		b) If all vertical openings and exterior vertical communications are properly protected in accordance with the National Building Code, consider only the single largest Floor Area plus 25% of each of the two immediately adjoining floors.			**25%**				
					Total Effective Area	**2016**			
3	Required Fire Flow without Reductions or Increases	Required Fire Flows without Reductions or Increases per FUS): (RFF= 220 x C x $A^{0.5}$)						10,000	
4	Factors Affecting Burning	**Reductions / Increases Due to Factors Affecting Burning**							
4.1	Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	%	(1,500)	8,500
			Limited combustible	-0.15					
			Combustible	0.00					
			Free burning	0.15					
			Rapid burning	0.25					
4.2	Reduction Due to Presence of Sprinklers	Sprinkler reduction	For a fully supervised system the conditions a), b) and c) below must be met.			-0.3	%	(2,550)	5,950
			a) Automatic sprinkler protection designed and installed in accordance with NFPA 13	-0.3	Yes				
			b) Water supply is standard for both the system and the Fire Department hose lines	-0.1	No				
			c) Fully supervised system	-0.1	No				
			None	0.0	No				
4.3	Separation Distance Between Units (Use 10% for 2 hour Fire Separation between adjacent units)	Exposure distance between units	North Side	10.1 to 20.0 m	0.15	0.4	%	3,400	9,350
			East Side	10.1 to 20.0 m	0.15				
			South Side	20.1 to 30.0 m	0.10				
			West Side	Greater than 30.0 m	0.00				
4.4	Combustibility of Wood Shingle or Shake Roof Material	Surcharge for potential to spread fire	Non-combustible roofing material	0	Non-combustible roofing material	0	L/min	0	9,350
			Low risk of fire spread	2000					
			Moderate risk of fire spread	3000					
			High risk of fire spread	4000					
						Total Required Fire Flow, rounded to nearest 1000 L/min, with max/min limits applied:			9,000
5	Required Fire Flow, Duration and Volume					Total Required Fire Flow (above) in L/s:		150	
						Required Duration of Fire Flow of 9,000 L/min (hrs):		2	
						Required volume for Fire Flow of 9,000 L/min (m^3):		1,080	

TATHAM ENGINEERING	Project: The Gateway Centre - Building 6	Date:	July 8, 2025
	File No.: 120119	Designed:	JB
	Subject: Fire Flow Calculations	Checked	AS
	Revisions:		

Fire Underwriters Survey 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	**Framing Material**							
		Coefficient related to type of construction (C)	Type V - Wood Frame Construction	1.5	Ordinary Construction	**1.0**	%	N/A	
			Type IVA - Mass Timber Construction	0.8					
			Type IVB - Mass Timber Construction	0.9					
			Type IVC - Mass Timber Construction	1.0					
			Type IVD - Mass Timber Construction	1.5					
			Ordinary Construction	1.0					
			Non-combustible Construction	0.8					
			Fire Resistive Construction	0.6					
2	Total Effective Area	Largest Floor Area				**1666**	m^2	N/A	
		Percentage of the Total Area of the Other Floors for Coefficient 1.0 to 1.5			**0%**	**0**			
		Percentage of the Total Area of the Other Floors for Coefficient below 1.0:							
		a) If any vertical opening in the building are unprotected, consider the two largest adjoining floor areas plus 50% of all floors immediately above them up to a maximum of eight, **or**			**50%**				
		b) If all vertical openings and exterior vertical communications are properly protected in accordance with the National Building Code, consider only the single largest Floor Area plus 25% of each of the two immediately adjoining floors.			**25%**				
					Total Effective Area	**1666**			
3	Required Fire Flow without Reductions or Increases	Required Fire Flows without Reductions or Increases per FUS): (RFF= 220 x C x $A^{0.5}$)							9,000
4	Factors Affecting Burning	**Reductions / Increases Due to Factors Affecting Burning**							
4.1	Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Combustible	0	%	-	9,000
			Limited combustible	-0.15					
			Combustible	0.00					
			Free burning	0.15					
			Rapid burning	0.25					
4.2	Reduction Due to Presence of Sprinklers	Sprinkler reduction	For a fully supervised system the conditions a), b) and c) below must be met.			0	%	-	9,000
			a) Automatic sprinkler protection designed and installed in accordance with NFPA 13	-0.3	No				
			b) Water supply is standard for both the system and the Fire Department hose lines	-0.1	No				
			c) Fully supervised system	-0.1	No				
			None	0.0	Yes				
4.3	Separation Distance Between Units (Use 10% for 2 hour Fire Separation between adjacent units)	Exposure distance between units	North Side	20.1 to 30.0 m	0.10	0.25	%	2,250	11,250
			East Side	10.1 to 20.0 m	0.15				
			South Side	Greater than 30.0 m	0.00				
			West Side	Greater than 30.0 m	0.00				
4.4	Combustibility of Wood Shingle or Shake Roof Material	Surcharge for potential to spread fire	Non-combustible roofing material	0	Non-combustible roofing material	0	L/min	0	11,250
			Low risk of fire spread	2000					
			Moderate risk of fire spread	3000					
			High risk of fire spread	4000					
						Total Required Fire Flow, rounded to nearest 1000 L/min, with max/min limits applied:			11,000
5	Required Fire Flow, Duration and Volume					Total Required Fire Flow (above) in L/s:			183
						Required Duration of Fire Flow of 11,000 L/min (hrs):			2
						Required volume for Fire Flow of 11,000 L/min (m^3):			1,320

Project:	The Gateway Centre - Building 7	Date:	September 16, 2024
File No.:	120119	Designed:	JB
Subject:	Fire Flow Calculations	Checked	AS
Revisions:			

BUILDING 7

Fire Underwriters Survey Fire Flow Calculations
Long Method

Calculation Based on 1999 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)
		Framing Material						
1	Frame Use for Construction of Unit	Coefficient related to type of construction (C)	Wood Frame	1.5	Ordinary Construction	**1**	-	N/A
			Ordinary Construction	1				
			Non-combustible construction	0.8				
			Fire resistive construction (< 2 hrs)	0.7				
			Fire resistive construction (> 2 hrs)	0.6				
		Floor Space Area						
2	Type of Occupancy	Type of Occupancy	Single Family	1			Units	N/A
			Townhouse / Apartment- inform # of units	1				
			Other (Comm. Ind., etc.)	1		**1**		
2.1	Number of Storeys	Number of Floors / Storeys in the unit (do not include basement)				**1**	Storeys	N/A
3	Floor Area	Total Floor Area (A) - for all storeys excluding basement			m^2	368	m^2	N/A
		Measurement Units	Square Feet (ft2)	0.093	1	**368**		
			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	4,000
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	Free burning	0.15	N/A	4600
			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	Complete automatic sprinkler protection	-0.3	None	0.00	N/A	0
			Standard hoses for both system & Fire Department	-0.10				
			Surpervised system	-0.1				
5.3	Separation Distance Between Units	Exposure distance between units	North Side	>30	0.00	0.00	N/A	0
			East Side	>30	0.00			
			South Side	>30	0.00			
			West Side	>30	0.00			
Total Required Fire Flow, rounded to nearest 1000 L/min, with max/min limits applied:								5000
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

TATHAM ENGINEERING	Project: The Gateway Centre - Building 8	Date:	July 8, 2025
	File No.: 120119	Designed:	JB
	Subject: Fire Flow Calculations	Checked	AS
	Revisions:		

Fire Underwriters Survey 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	**Framing Material**							
		Coefficient related to type of construction (C)	Type V - Wood Frame Construction	1.5	Ordinary Construction	**1.0**	%	N/A	
			Type IVA - Mass Timber Construction	0.8					
			Type IVB - Mass Timber Construction	0.9					
			Type IVC - Mass Timber Construction	1.0					
			Type IVD - Mass Timber Construction	1.5					
			Ordinary Construction	1.0					
			Non-combustible Construction	0.8					
			Fire Resistive Construction	0.6					
2	Total Effective Area	Largest Floor Area				**1106**	m^2	N/A	
		Percentage of the Total Area of the Other Floors for Coefficient 1.0 to 1.5			**0%**	**0**			
		Percentage of the Total Area of the Other Floors for Coefficient below 1.0:							
		a) If any vertical opening in the building are unprotected, consider the two largest adjoining floor areas plus 50% of all floors immediately above them up to a maximum of eight, **or**			**50%**				
		b) If all vertical openings and exterior vertical communications are properly protected in accordance with the National Building Code, consider only the single largest Floor Area plus 25% of each of the two immediately adjoining floors.			**25%**				
					Total Effective Area	**1106**			
3	Required Fire Flow without Reductions or Increases	Required Fire Flows without Reductions or Increases per FUS): (RFF= 220 x C x $A^{0.5}$)							7,000
4	Factors Affecting Burning	**Reductions / Increases Due to Factors Affecting Burning**							
4.1	Combustibility of Building Contents	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Combustible	0	%	-	7,000
			Limited combustible	-0.15					
			Combustible	0.00					
			Free burning	0.15					
			Rapid burning	0.25					
4.2	Reduction Due to Presence of Sprinklers	Sprinkler reduction	For a fully supervised system the conditions a), b) and c) below must be met.			0	%	-	7,000
			a) Automatic sprinkler protection designed and installed in accordance with NFPA 13	-0.3	No				
			b) Water supply is standard for both the system and the Fire Department hose lines	-0.1	No				
			c) Fully supervised system	-0.1	No				
			None	0.0	Yes				
4.3	Separation Distance Between Units (Use 10% for 2 hour Fire Separation between adjacent units)	Exposure distance between units	North Side	20.1 to 30.0 m	0.10	0.2	%	1,400	8,400
			East Side	20.1 to 30.0 m	0.10				
			South Side	Greater than 30.0 m	0.00				
			West Side	Greater than 30.0 m	0.00				
4.4	Combustibility of Wood Shingle or Shake Roof Material	Surcharge for potential to spread fire	Non-combustible roofing material	0	Non-combustible roofing material	0	L/min	0	8,400
			Low risk of fire spread	2000					
			Moderate risk of fire spread	3000					
			High risk of fire spread	4000					
								Total Required Fire Flow, rounded to nearest 1000 L/min, with max/min limits applied:	8,000
5	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 (m^3):	960

Appendix D:
Sanitary Design Sheet

TATHAM ENGINEERING

Sanitary Sewer Design Sheet

Version Number: 1 **Version Date:** July 8, 2025

Project Information

The Gateway Centre Option C.06-L	120119

Drawing Reference

GS02	July 08/25

Prepared By

John Birchard	July 08/25

Reviewed By

Joshua Nemisz	July 08/25

Municipality

Town of Collingwood

Population Density

Capita per Unit	Low	Medium	High
	1.90	2.90	-

Infiltration

Infiltration (L/s/ha)	0.23

Flow

Development Type	Average (L/cap/day)	Peaking Factor
Residential	260	Harmon
Development Type	**Average (L/ha/day)**	**Peaking Factor**
Institution	-	-
Commercial	-	3
Industrial High Intensity	-	-
Industrial Low Intensity	-	-

Manning's Coefficient

Pipe Material	Value
Concrete	0.013
PVC	0.013
Applied	0.013

Engineer Stamp

Street Name	Area Label/ID	Upstream Maintenance Hole	Downstream Maintenance Hole	Development Type	Population Density	Number of Units	Population (cap)	Accumulated Population (cap)	Peaking Factor	Area (ha)	Cumulative Area (ha)	Average Flow (L/s)			Peak Flow (L/s)			Proposed Sanitary Sewer							
												Development	Infiltration	Total	Development	Infiltration	Total	Sewer Length (m)	Sewer Slope (%)	Actual Sewer Diameter (mm)	Full Flow Velocity (m/s)	Full Flow Capacity (L/s)	Actual Velocity (m/s)	Calculated Sewer Diameter (mm)	Percentage of Full Flow Capacity (%)
The Gateway Centre - Commercial	-	-	MH6B	Commercial		-		0.0	3.00	3.76	3.76	0.93	0.86	1.79	2.79	0.86	3.65	220.0	0.8%	200	0.90	28.40	0.60	93	12.9%
The Gateway Centre - Residential	-	-	MH6B	Residential	Low	165	313.5	313.5	4.07	0.00	0.00	0.94		0.94	3.84		3.84	75.0	0.8%	200	0.90	28.40	0.61	94	13.5%
Flow From Pretty River Estates	201	MH2A	MH1A	Residential	Med.	477	1383.3	1383.3	3.70	24.62	24.62	4.16	5.66	9.83	15.42	5.66	21.08	108.5	0.4%	250	0.78	38.08	0.76	200	55.4%
Hamilton Drain Easement	202	MH1A	MH6B	Residential	Med.	0	0.0	1383.3	3.70	0.03	24.65	4.16	5.67	9.83	15.42	5.67	21.09	41.9	0.4%	250	0.74	36.17	0.73	204	58.3%
Hamilton Drain Easement	203	MH6B	MH62A	Residential	Med.	0	0.0	1696.8	3.64	0.04	28.45	6.04	6.54	12.58	22.05	6.54	28.60	69.6	0.4%	250	0.74	36.17	0.74	229	79.1%
Hamilton Drain Easement	204	MH62A	MH18A	Residential	Med.	0	0.0	1696.8	3.64	0.01	28.46	6.04	6.55	12.58	22.05	6.55	28.60	17.7	2.4%	200	1.62	50.81	1.59	161	56.3%

1. See Appendix A of The Gateway Centre Functional Servicing Report (March 2022) for Commercial Water Demand Calculations
2. Flow rates from Pretty River Estates obtained from Sanitary Design Sheet completed by exp (No. 1584-ADD3 June 2012)