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796060 Grey Road 19

PRELIMINARY FUNCTIONAL SERVICING REPORT

2483302 Ontario Inc.

Document Control

File:

123143

Date:

**February
6, 2026**

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1	February 6, 2026	1 st Submission

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1 Introduction

Tatham Engineering Limited (Tatham) has been retained by 2483302 Ontario Inc. (Owner) to complete a Preliminary Functional Servicing Report (FSR) in support of an Official Plan Amendment for the proposed development located at 796060 Grey Road 19 in the Town of The Blue Mountains.

1.1 SITE DESCRIPTION

The proposed development is legally described as Part of Lot 63, Registrar's Compiled Plan 950, Part 1, Plan 16R-2789. Municipally, it is identified as 796060 Grey Road 19, Town of The Blue Mountains, Grey County. The site is bound by Grey Road 19 and existing low density residential properties to the north, existing low density residential properties and undeveloped lands to the east and west, and undeveloped lands to the south. The subject property is approximately 9.9 ha in total area and comprised of undeveloped lands consisting of wooded, open space and agricultural areas. A tributary of Silver Creek flows through the site from southwest to northeast.

1.2 OBJECTIVES

The purpose of this report is to address the requirements of the Town of The Blue Mountains (Town) and the Ministry of Environment, Conservation and Parks (MECP) with respect to the relevant water and sanitary servicing design criteria and ultimately ensure the project is appropriately developed to minimize the impact on existing downstream servicing infrastructure. Requisite criteria, preliminary servicing design calculations and existing servicing capacities are summarized in the following sections of this report.

1.3 BACKGROUND AND GUIDELINES

This report was prepared recognizing the provincial guidelines, municipal standards and background documents including but not limited to the following:

- Town, *Engineering Standards*: (May 29, 2023);
- MECP, *Design Guidelines for Drinking-Water Systems*, (2008);
- Fire Underwriters Survey (FUS), *Water Supply For Public Fire Protection*, (2020);
- MECP, *Design Criteria for Sanitary Sewers, Storm Sewers and Force mains for Alterations Authorized Under an Environmental Compliance Approval*, (2023);
- J.L. Richards & Associates Limited (J.L. Richards), *Master Plan Report, Town of The Blue Mountains Wastewater Master Plan*, (June 12, 2025);



- WT Infrastructure Solutions Incorporated, *Long Point Road Sanitary Sewer and Craigeleith Wastewater Treatment Plant Upgrades Municipal Class EA*, (October 5, 2023);
- Tatham, *Highway 26 Flow Monitoring (Grey Road 21 to Timmons Street), Town of The Blue Mountains Data Review & Assessment*, (January 27, 2020);
- Town, *Water and Wastewater Capacity Assessment 2024 Year End Report*, (March 31, 2025);
- Tatham, *Mountain Road Booster Pumping Station Relocation Design Brief*, (July 29, 2024);
- J.L. Richards, *Town of The Blue Mountains Municipal Master Plan for Town-Wide Water Distribution System*, (October 24, 2019); and
- J.L. Richards, *Project File Report – 90% Report, Town of The Blue Mountains Municipal Class Environmental Assessment Eastside Water Storage and Supply*, (February 5, 2024).

1.4 PROPOSED DEVELOPMENT

The proposed development consists of 3 three-storey and 5 five-storey residential buildings (603 dwelling units in total). Parking for the site will be provided by an at-grade above ground parking lot with a total area of 19,240 m². Site access will be provided by a proposed road off of Grey Road 19, directly across from Crosswinds Boulevard.

The location of the development site is further illustrated on Figure 1.



2 Sanitary Sewage System

2.1 EXISTING SEWER

During previous road reconstruction efforts on Grey Road 21, a new sanitary sewer was extended south from Highway 26 to the northern limit of the Mountain House at Windfall property. Ranging in size between 375 mm to 525 mm diameter, the sewer extends service to multiple development properties with capacity for future extension further south to service secondary planning areas, including the proposed site, alongside the Castle Glen and Ostler properties. Sewage flows within the trunk sewer are currently conveyed to the Craigleith Wastewater Treatment Plan (WWTP) via a temporary connection to the Craigleith Sewage Pumping Station (SPS). New servicing infrastructure to be constructed in conjunction with upgrades to the WWTP and Long Point Road, are scheduled for completion in 2028 and will disconnect the existing trunk from the temporary connection to the Craigleith SPS.

In lieu of the municipal design standards at the time, design of the trunk sewer was prepared based upon MECP design criteria, environmental study reports and master servicing plans available at the time. In doing so, design flows in the trunk sewer were more in line with typical sewage flows observed in the network.

For the purposes of this report, the original design sheets have been recreated and updated to reflect as-built conditions of the trunk sewer and actual population figures from several more recently completed developments.

2.2 PROPOSED SANITARY SEWER SYSTEM

2.2.1 Sewage Design Flows

For the internal lands, preliminary unit counts and layout are based upon the June 6, 2025 Conceptual Site Plan prepared by Ware Malcomb. To establish unit counts and service areas of undeveloped, external lands in secondary planning areas, it is presumed 60% of the subject lands are developable (based on the Town's zoning bylaw which requires new development provide a minimum of 40% open space) and a maximum development density of 15 units per hectare can be achieved throughout.

Municipal Standard

Sewage design flows in accordance with the Town's standard design criteria (350 L/person/day, 2.15 people per unit, 0.28 L/s/ha infiltration) is utilized in the design of local sewers within the site and external sewers along Grey Road 19 to the connection with the existing trunk.



Flow Monitoring

To assess capacity of the existing trunk sewer in a format similar to the original design that applied lower MECP criteria, design flows were established based on the flow monitoring completed by Tatham in 2020. This flow monitoring program assessed local sewage flows immediately downstream of the Windfall development with cross-referencing to occupancy rates. Based on an occupancy of 2.3 people per unit, this monitoring established a maximum daily flow rate of 287 L/person/day, which will be applied as the average daily flow for the purposes of this report. Utilizing peak flow data, a conservative estimate of 339 L/person/day is established for infiltration in the receiving sewers.

Supporting calculations are provided in Appendix A.

2.2.2 Internal Sewers

Within the development lands, the proposed sewer generally consists of two branches of 200 mm diameter pipe with grades between 0.5% and 1.0% meeting at conceptual MH A7. One branch extends west of this junction to service Buildings A and B, while the second branch extends south, below the existing drainage channel, to service Buildings E through H.

From MH A7 to Grey Road 19, the sewer is upsized to a 250 mm diameter pipe which also provides service directly to Buildings C and D.

Servicing of External Lands Through Site

A 200 mm diameter sewer at 0.5% could be constructed along the extension of Crosswinds Boulevard through the site to extend service to approximately 14.9 ha of developable land on the adjacent property to the south. These lands represent a section of the “DD Area 2” secondary planning area to the north of an existing watercourse crossing the site. Please refer to drawing SAN.2 appended to this report which illustrates the approximate limits of this area. The future sewer along the extension of Crosswinds Boulevard is not required to provide service to the subject site, and as such would not be constructed as part of the proposed development; rather, the sewer would be constructed (by others) if and when development to the south of the subject site proceeds, thus reducing unnecessary municipal infrastructure until such time as it is needed.

Peak Flows per Municipal Standards

Based on the Town standard design criteria, the proposed development will generate a peak flow 20.9 L/s and will utilize up to 55.2% of the proposed sewer capacity internally. The adjacent lands will generate a peak flow of 12.0 L/s and utilize up to 51.5% of the future sewer capacity.



Peak Flows per Flow Monitoring

Applying sewage flows derived from flow monitoring, the proposed development will generate a peak flow 22.5 L/s and will utilize up to 59.7% of the proposed sewer capacity internally. The adjacent lands will generate a peak flow of 8.8 L/s and utilize up to 38.0% of the future sewer capacity.

Supporting calculations and sewer design sheets are provided in Appendix A.

2.2.3 Grey Road 19 Sewer

The external sewer proposed on Grey Road 19 consists of a 250 mm diameter sewer at 0.5% grade. In addition to the sewage flows from the proposed development and the DD2 lands, the external sewer will extend service to existing residential dwellings fronting Grey Road 19 alongside approximately 3.80 ha of developable land to the west and 3.46 ha of developable municipal land to the east. The existing Price subdivision is serviced through the Windfall development lands while the MDR-33 development is serviced via Scenic Caves Road.

Peak Flows per Municipal Standards

Based on the Town standard design criteria, peak flows in the external sewer will reach 37.4 L/s where Grey Road 19 intersects Grey Road 21. This flow will utilize up to 88.8% of the proposed Grey Road 19 sewer capacity.

Peak Flows per Flow Monitoring

Applying sewage flows derived from flow monitoring, the peak flows in the external sewer will reach 34.0 L/s where Grey Road 19 intersects Grey Road 21. This flow will utilize up to 81.0% of the proposed Grey Road 19 sewer capacity.

Supporting calculations and sewer design sheets are provided in Appendix A.

2.3 SEWAGE CAPACITY

2.3.1 Grey Road 21 Trunk Sewer Extension

Ongoing design work for the roundabout proposed at the intersections of Grey Road 21, Grey Road 19 and Mountain Road, will serve to extend the existing trunk sewer south of its current limit at existing MH E29. The sewer will extend through the intersection, terminating just south of Slalom Gate Road at MH 101 as illustrated on Drawing SAN.2. The new sewer consists of 375 mm diameter pipe at grades between 0.5% and 3.6%.



Future Grey Road 19 Servicing South of Grey Road 21

Further extension of this sewer in the future will ultimately service the remainder of the “DD Area 2” lands in addition to the future connection of the DD Area 1 lands, Osler Properties and the Castle Glen development areas.

The unit counts and developable areas applied for the external lands are summarized in Table 1.

Table 1: External Development Lands

DEVELOPMENT REFERENCE	TOTAL AREA (ha)	DEVELOPABLE AREA (ha)	UNIT COUNT	UNIT COUNT BASIS
DD Area 2	78.25	46.95	705	15 Units/ha Note: Excludes area serviced through proposed site.
DD Area 1	91.00	54.60	819	15 Units/ha
Osler Properties	112.20	65.69	236	Grey County 21 Sewer Extension Design (2012) & Design Calculations prepared by Crozier Consulting Engineers dated 2023-12-15
Castle Glen	291.65	291.65	2,029	“Schedule B” Secondary Plan & Existing Development

Proposed Connection to Grey Road 21

The proposed Grey Road 19 sewer will connect to the Grey Road 21 sewer at SAN MH104, located in the centre island in the roundabout as illustrated on drawing SAN.2.

Peak Flows per Flow Monitoring

The existing trunk sewer on Grey Road 21 was originally designed and constructed based upon MECP design criteria, environmental study reports and master servicing plans available at the time. By virtue of this previous design, the extension of the sewer further south on Grey Road 19 south of Grey Road 21 should also be assessed on a similar basis, generally coinciding with the observed flow monitoring. Application of the Town's typical sewer design criteria would show the sewer as being over capacity where this is not the case in practice.

Applying the design flows based on flow monitoring data, the sewer from MH104 to MH E29 reaches a maximum of 86% of its full flow capacity. This section of the sewer includes sewage flows from both the proposed development lands and future external lands.



The sewer extension from MH 101 to MH 104, which is south of Grey Road 19, is noted to reach 98% of the full flow capacity based on the current design grade of 0.5%. Increasing the grade to 0.7% improves capacity so future sewage flows are conveyed at 82.8% of the full flow capacity of the sewer. This minor revision will be communicated with the design team for the roundabout reconfiguration.

Supporting sewer design sheets are provided in Appendix A.

2.3.2 Existing Grey Road 21 Trunk Sewer

As noted above, the existing trunk sewer was designed and constructed on the basis of MECP design criteria, environmental study reports and master servicing plans available at the time. Based on the unit rates derived from flow monitoring, the existing trunk sewer and future extension on Long Point Drive have sufficient capacity to convey the combined sewage flows discussed above to the Craigleith WWTP. Along the existing section of trunk sewer, the pipe capacity is calculated to reach a maximum of 74.2% of its design capacity.

Based on the foregoing, the proposed sewer extensions and existing trunk sewer on Grey Road 21 have sufficient capacity to convey sewage flows from the proposed development and other developments within the secondary plan area.

Supporting calculations and sewer design sheets are provided in Appendix A.

2.3.3 Craigleith WWTP

Referring to the Wastewater Master Plan Report, the Craigleith WWTP has an average day flow capacity of 8,133 m³/day and a maximum day flow capacity of 19,640 m³/day. Based on five-year average flow data from 2018 to 2022, actual sewage flows at the Craigleith WWTP reach 3,385 m³/day and 10,836 m³/day for the average day and maximum day conditions respectively.

Adjusting for more recent 2023 and 2024 flow data in the Year End report reveals the five-year average daily flows are generally consistent with the Master Planning Report, increasing slightly to 3,428 m³/day. Maximum day flows meanwhile are slightly lower, with a five-year average of 10,486 m³/day however, the flow data also reveals a downward trend from the peaks observed in 2020 and 2021.

In the 2024 Year End report, an average daily unit flow rate of 0.62 m³/unit/day is established alongside a max day peaking factor of 3.01. Expanding the figures in the Year End report to include the secondary planning areas expected to be serviced by the proposed sewer extensions reveals sufficient servicing capacity is available as summarized in Table 2.



Table 2: Craigleith WWTP Service Capacity

DESCRIPTION	NO. UNITS	AVERAGE DAILY FLOW (m ³ /d)	MAX DAY FLOW (m ³ /d)
Currently Connected	5,720	3,546	10,673
Allocated	295	183	551
Reserved	2,571	1,594	4,798
Proposed Development	603	374	1,126
Grey Road 19 External Servicing	337	209	629
Total	9,526	5,906	17,777
Current Capacity		8,133	19,640
Remaining Capacity		2,227	1,863

Note: 337 Unit figure includes all external lands and existing residences serviceable via Grey Road 19 Sewer.

As observed in Table 2, the Craigleith WWTP will have remaining capacity of 2,227 m³/day following full build-out of the proposed development and other secondary planning areas, coinciding with approximately 3,592 units. The remaining maximum day capacity of 1,863 m³/day however, coincides with approximately 998 residential units. As noted in the Year End report, the highest flows recorded over the course of 2024 appear to be related to heavy rainfall and other precipitation or snowmelt events, indicating inflow and infiltration is having an impact on the max day flows. Modern construction techniques and materials, however, are anticipated to help mitigate inflow and infiltration through the proposed servicing extension and development alongside identification and repair of existing municipal infrastructure to mitigate inflow and infiltration from external sources.



3 Water Supply & Distribution

3.1 EXISTING INFRASTRUCTURE

Under existing conditions, a 350 mm diameter watermain is extended along the south side of Grey Road 19 across the frontage of the site. To the east, this watermain is supplied through the Mountain Road Booster Pump Station, supplying water from the Town of Collingwood to The Town of The Blue Mountains. Current agreements limit the supply through this connection to 1,250 m³/day. To the west, the watermain is supplied through existing infrastructure via the Happy Valley Reservoir. Referring to the 2019 Master Plan, typical operating pressures during average day demand are greater than 550 kPa across the frontage of the site and available fire flows are in excess of 50 L/s.

3.2 PROPOSED INFRASTRUCTURE

The proposed development will be serviced via two connections to the existing watermain, coinciding with the restricted access at the east limit of the site and the municipal road access at the west limit of the site. The west connection consists of a 250 mm diameter watermain extended south on the proposed extension of Crosswinds Boulevard to the south limit of the property where it is capped for future extension to the south. The watermain on Crosswinds Boulevard will become municipal infrastructure once assumed. Building A will be serviced directly from the 250 mm diameter watermain.

The east connection to the watermain on Grey Road 19 consists of a 200 mm diameter watermain extending south through the eastern half of the site and connecting to the municipal watermain on Crosswinds Boulevard at the south limit of the site. The 200 mm diameter watermain will provide service to Buildings B through H and will require backflow prevention and metering at either end as it will be privately owned.

Domestic water supply to each building is proposed through a single 75 mm diameter water service while a separate 200 mm diameter service is proposed for fire protection. Demands for sizing these service connections and supply infrastructure is discussed in greater detail in the following sections below.

3.3 WATER DEMANDS ASSESSMENT

3.3.1 Fire Underwriters Survey Assessment

Minimum fire flows were calculated for each of the proposed buildings based on the procedures outlined in the FUS guidelines. For the purposes of this assessment, each of the buildings is presumed to conform with Section 3.2.2.49 of the Ontario Building Code (OBC), allowing for



sprinklered buildings of non-combustible construction up to 6 storeys in height. This coincides with Type IVB – Mass Timber Construction when applied in the FUS calculations. Accounting for differences in building heights, floor areas and spatial separations, fire fighting demands between 100 L/s and 150 L/s were calculated for the proposed development site.

3.3.2 Domestic Water Service Demands

Domestic servicing demands throughout the proposed site and to the external site to the south were calculated in accordance with municipal standards and MECP guidelines. In addition to the 603 units proposed on-site, an additional 224 units are presumed to be serviced on the property to the south. Peaking factors applied are interpolated from Tables 3-1 and 3-3 of the MECP Design Guidelines for Drinking – Water Systems. Design parameters are further defined in Table 3.

Table 3: Water Servicing Criteria

DESIGN CRITERIA		SOURCE
Residential Population	2.15 persons/unit	Town
Average Daily Demand Per Person	350 L/person/day	Town
Maximum Daily Demand Factor	2.60 (Site) up to 7.00 (Building)	MECP
Peak Hourly Demand Factor	3.90 (Site) up to 10.50 (Building)	MECP
Allowable Pressure Ranges		
Maximum Pressure	550 kPa (80 psi)	Town
Peak Hour Minimum Pressure	275 kPa (40 psi)	Town
Maximum Day Plus Fire Flow Minimum Pressure	140 kPa (20 psi)	Town
Minimum Service Pressure to Dwelling	200 kPa (29 psi)	OBC

Water servicing demand calculations for the development are included in Appendix C with the maximum servicing demands summarized in Table 4.

Utilizing typical Hazen-Williams calculations for assessing friction losses alongside the water servicing demands above, the proposed combination of 250 mm and 200 mm diameter watermains, 75 mm diameter domestic services and 200 mm diameter fire protection services will be sufficient to meet the water servicing demands of the development. Velocities in the



domestic services are maintained above 0.6 m/s while watermains maintain velocities between 0.6 m/s and 5.0 m/s during maximum day plus fire flow demands.

Table 4: Maximum Water Servicing Demands

DEMAND	PER BUILDING (L/s)	FULL SITE (L/s)
Average Daily Demand	0.78	7.20
Peak Hour Demand	5.41	28.09
Maximum Day Demand	3.61	18.73
Maximum Day Plus Fire Flow	153.61	168.73

Static pressures are conservatively based on the highest point of connection near the west limit of the site, approximately 220.50 m based on GIS contours and presumed depth of 2.0 m, with a 0.3 m increase in grade on the private site. The maximum elevation is applied to conservatively calculate minimum pressures during key design scenarios, namely maximum day plus fire flow and peak hour. Site grading will likely see finished grades decrease in a west to east direction, increasing static pressure from the values presumed. These effects will be considered in greater detail during detailed design.

It is also noted most of the dwelling units in the proposed development are proposed to be single bedroom units; as such, actual water servicing demands on a per capita basis are anticipated to be lower than those calculated through application of the Town design standards.

3.4 DOMESTIC WATER SUPPLY AVAILABILITY

3.4.1 Local Servicing

For the purposes of internal maximum day plus fire flow demand calculations, it is presumed the watermain on Grey Road 19 is able to achieve a minimum service pressure of 350 kPa (50 psi) at the proposed points of connection. This is considered a conservative estimate as the 2019 Master Servicing Study shows the watermain is able to achieve pressures greater than 550 kPa during average day demand. The Master servicing plan also indicates fire flow demands in excess of 50 L/s are available, with flows in pressure Zone 4 achieving between 61 L/s and 467 L/s. Referring to the water servicing calculations in Appendix C, the maximum day demand plus fire flow can be met at each building with residual pressures in excess of 140 kPa.

For peak hour demand calculations, it is again presumed the watermain on Grey Road 19 is able to achieve the minimum service pressure of 275 kPa (40 psi) to ensure the minimum service pressure of 200 kPa (29 psi) is achieved where the water service enters the building foundation.



Referring again to the calculations in Appendix C, this is achieved for every building within the development.

3.4.2 Municipal Supply Infrastructure

Supply of water throughout the municipality is currently provided by the Thornbury Water Treatment Plant (WTP). The WTP has a rated capacity of 15,140 m³/day. Due to limitations of the high lift pumps identified in a 2022 capacity assessment, the WTP has an actual supply capacity of 13,392 m³/day. The water supply is supplemented by the Mountain Road Booster Pumping Station that provides up to 1,250 m³/day from the Town of Collingwood, increasing the combined supply up to 14,642 m³/day during maximum day demand.

Referring to the Town's 2024 Year End Report, the 5-year average daily demand is 0.610 m³/unit/day, or 6,240 m³/day when applied to the 10,230 units currently serviced. Maximum day demand meanwhile is 1.002 m³/unit/day, coinciding with a total demand of 10,250 m³/day. Based on these most recent figures and presuming the Thornbury WTP is operating at the higher rated capacity, it is estimated an additional 6,127 units can be serviced by the existing water distribution system.

Based on current estimates, an additional 677 units have been allocated for connection, with an additional 2,548 units reserved for connection to the water distribution system. Accounting for these future connections reduces the available number of connections to 2,902 units. Therefore, there is sufficient available capacity within the existing municipal supply infrastructure to supply the proposed development.



4 Stormwater Management

A separate Stormwater Management (SWM) report has been prepared by Tatham Engineering to address drainage and SWM requirements for the development and is submitted under separate cover. A brief summary of the SWM servicing strategy is as follows:

- The majority of local drainage within the site will be captured by an internal storm sewer network discharging to proposed quantity and quality control infrastructure prior to discharge to the existing drainage feature running through the centre of the property.
- Major flows will be safely conveyed to proposed on-site SWM infrastructure via the existing and proposed roadways and drainage blocks. The volume of runoff will be controlled to ensure sufficient mitigation is provided to maintain peak flow rates consistent with existing site conditions.
- Quality control of runoff from the site will be provided by the proposed on-site SWM infrastructure, to be developed during detailed design, prior to release to the site outlet.
- Siltation and erosion controls will be implemented for all construction activities, including topsoil stripping, material stockpiling, road construction and grading operations.



5 Transportation

The proposed development includes construction of a new municipal road allowance coincident with the existing intersection of Grey Road 19 and Crosswinds Boulevard. It is understood designs are currently underway to construct a roundabout in this location.

Private roadways are proposed to extend from the new municipal road, providing access to the individual buildings and supporting parking infrastructure within the site. A secondary access to Grey Road 19, for use by emergency and service vehicles only, is also proposed on the east side of the site.

Additional details pertaining to the transportation design of the site is included in the Transportation Impact Study and the Parking Justification Study, both prepared by Tatham and submitted under separate cover.



6 Utilities

6.1 ELECTRICAL SERVICES

Hydro One has existing overhead infrastructure on the north side of Grey Road 19, providing electrical service to nearby residential dwellings and developing communities. Based on preliminary information, there appears to be excess servicing capacity available near the proposed site. Review of servicing capacity and alignment will be reviewed with Hydro One at detailed design.

6.2 NATURAL GAS SERVICES

Enbridge Gas Ontario has existing servicing infrastructure within the north boulevard of Grey Road 19 with services extending across the road to existing dwellings adjacent to the proposed site. Review of natural gas servicing capacity will be reviewed with Enbridge at detailed design.

6.3 TELEPHONE & INTERNET SERVICES

Bell and Rogers both have existing overhead and underground telecommunications infrastructure on both sides of Grey Road 19 extending across the frontage of the site. Servicing infrastructure is understood to include fiber optic alongside conventional telecommunications servicing. Review of servicing capacity will be conducted with Bell and Rogers during detailed design.

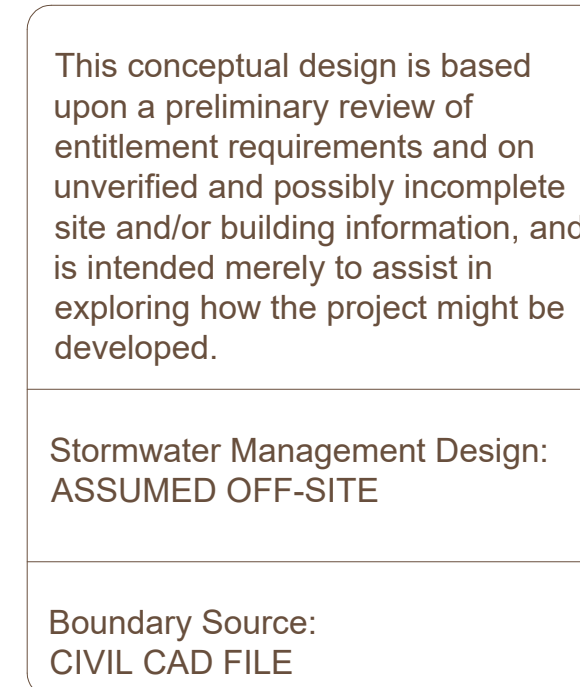


7 Summary

As outlined above, existing infrastructure surrounding the subject property can adequately service the development for sanitary sewage, potable water, electrical service, natural gas and telecommunications. A SWM report, Transportation Impact Study and Parking Justification Study submitted under separate cover confirm the SWM and transportation objectives and requirements for the site can be met. A summary of the servicing strategy is as follows:

- Sanitary servicing will be provided by 200 mm and 250 mm diameter sanitary sewers internal to the site alongside the extension of a 250 mm diameter sewer on Grey Road 19.
- The proposed sewer servicing configuration is based on the external upgrades along Long Point Road for conveyance to the WWTP in lieu of upgrades to the existing jumper pipe and Craigleith SPS.
- Potable water will be provided by connecting to the existing 350 mm diameter watermain on Grey Road 19 in two locations. A new 250 mm diameter public watermain is extended south along the proposed municipal roadway providing service to one of the proposed buildings and external lands to the south. A new 200 mm diameter private watermain with backflow prevention provides service to the remaining seven buildings. The proposed watermains will have sufficient capacity to provide the peak hour water demand and the maximum day plus fire flow demands while maintaining acceptable system pressure.
- There are existing utilities on adjacent roadways used to service the proposed development.



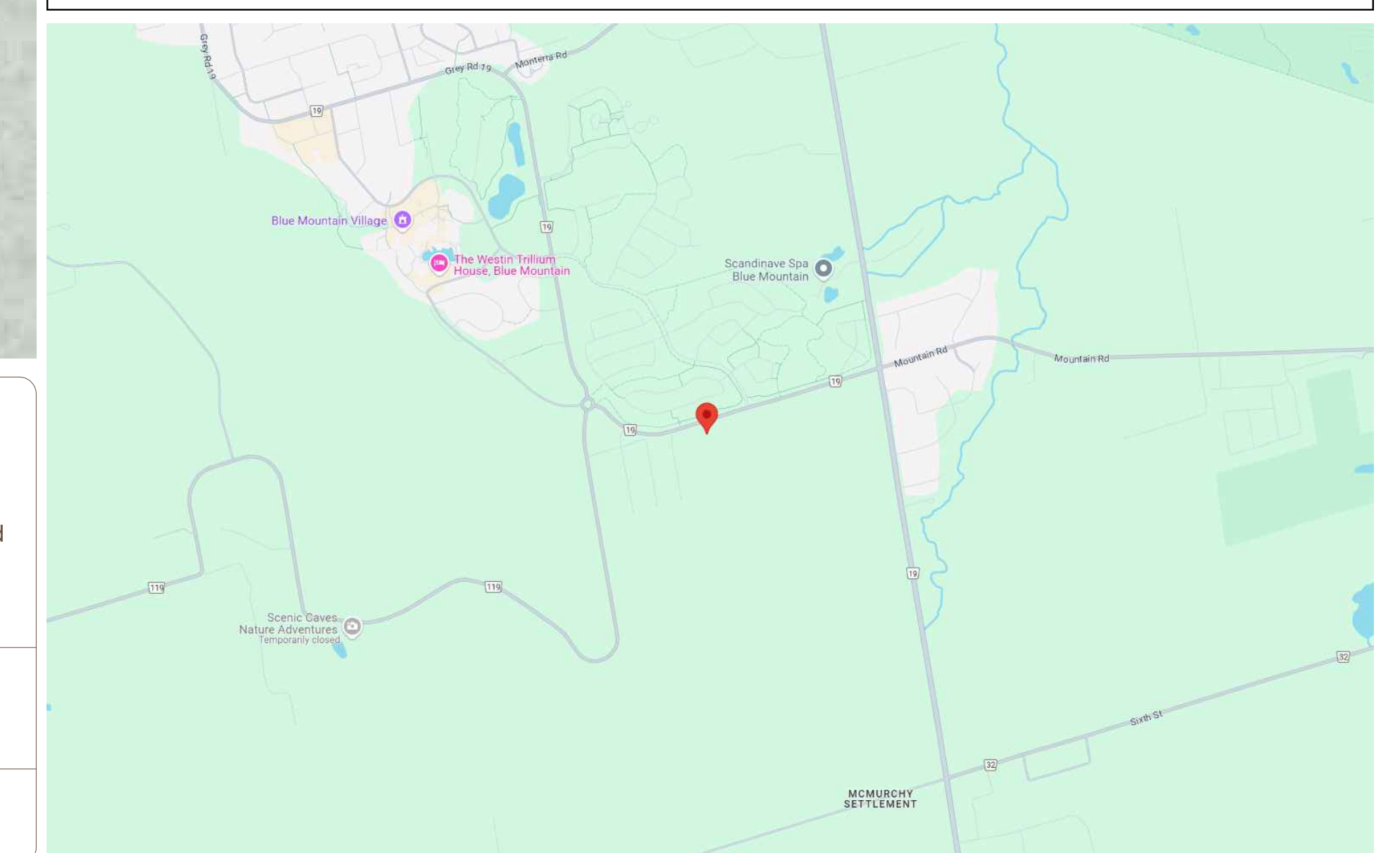


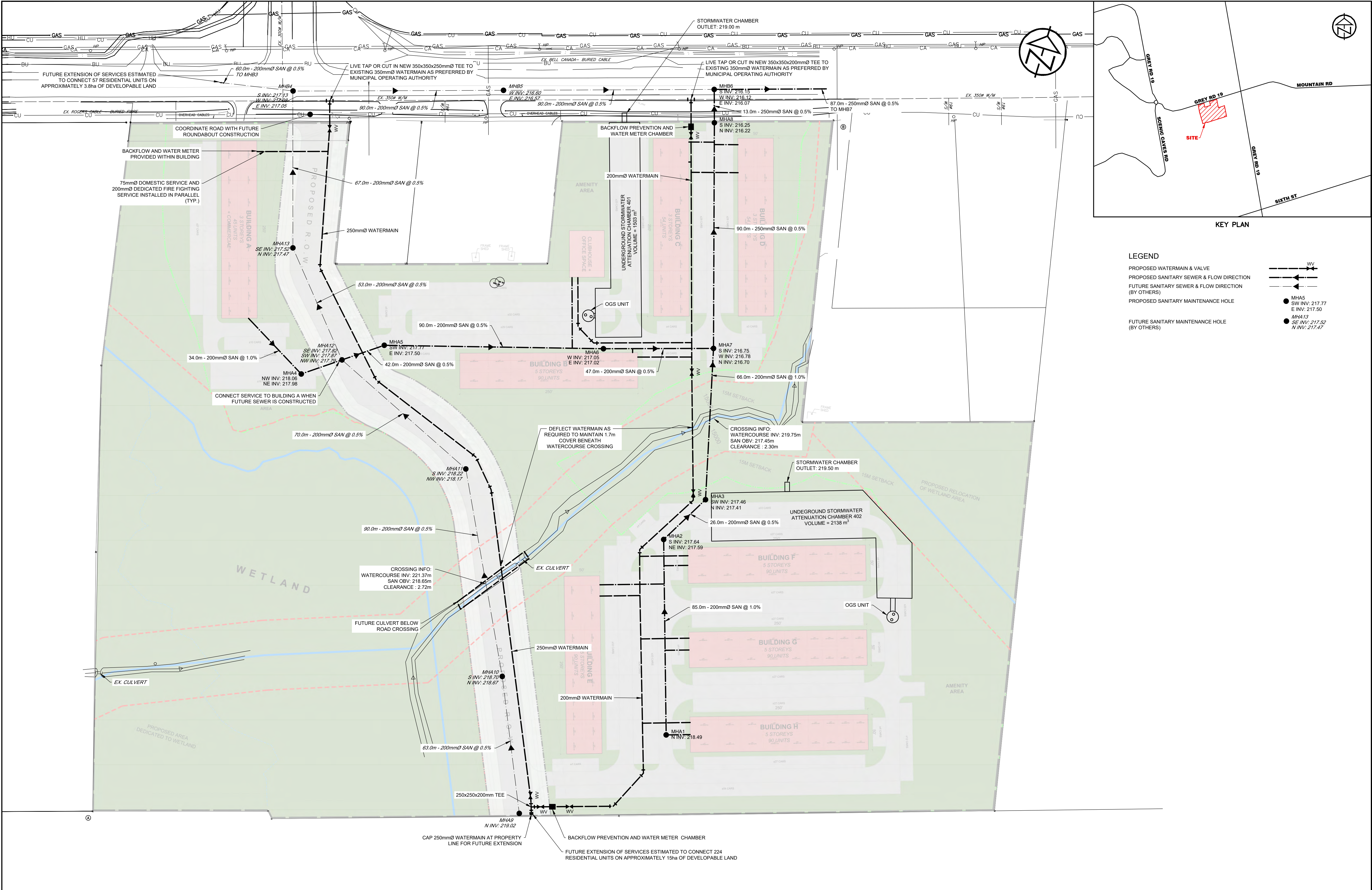
Conceptual Site Plan

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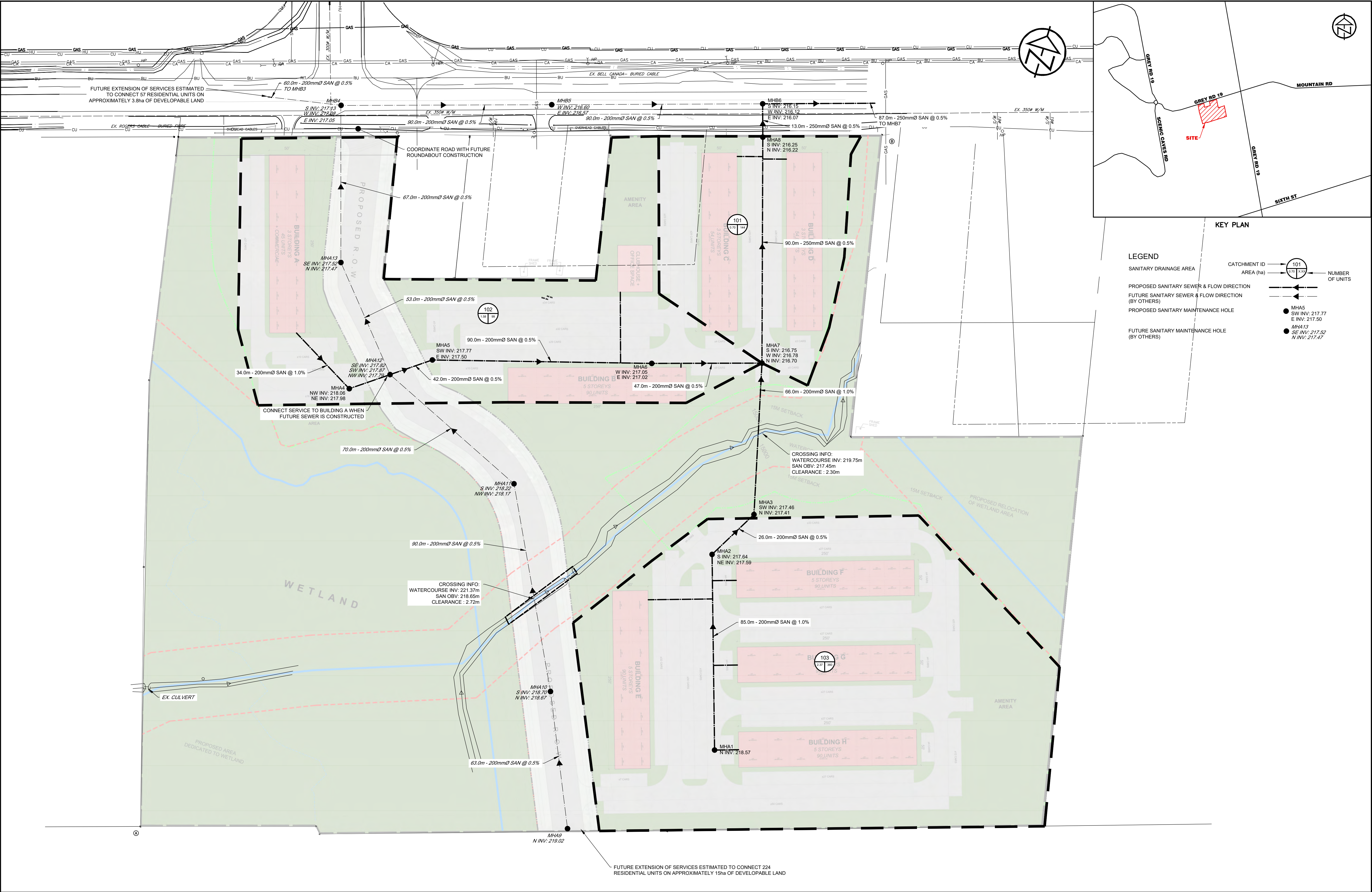
PROPOSED WATERMAIN & VALVE
PROPOSED SANITARY SEWER & FLOW DIRECTION
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PROPOSED SANITARY MAINTENANCE HOLE

FUTURE SANITARY MAINTENANCE HOLE (BY OTHERS)

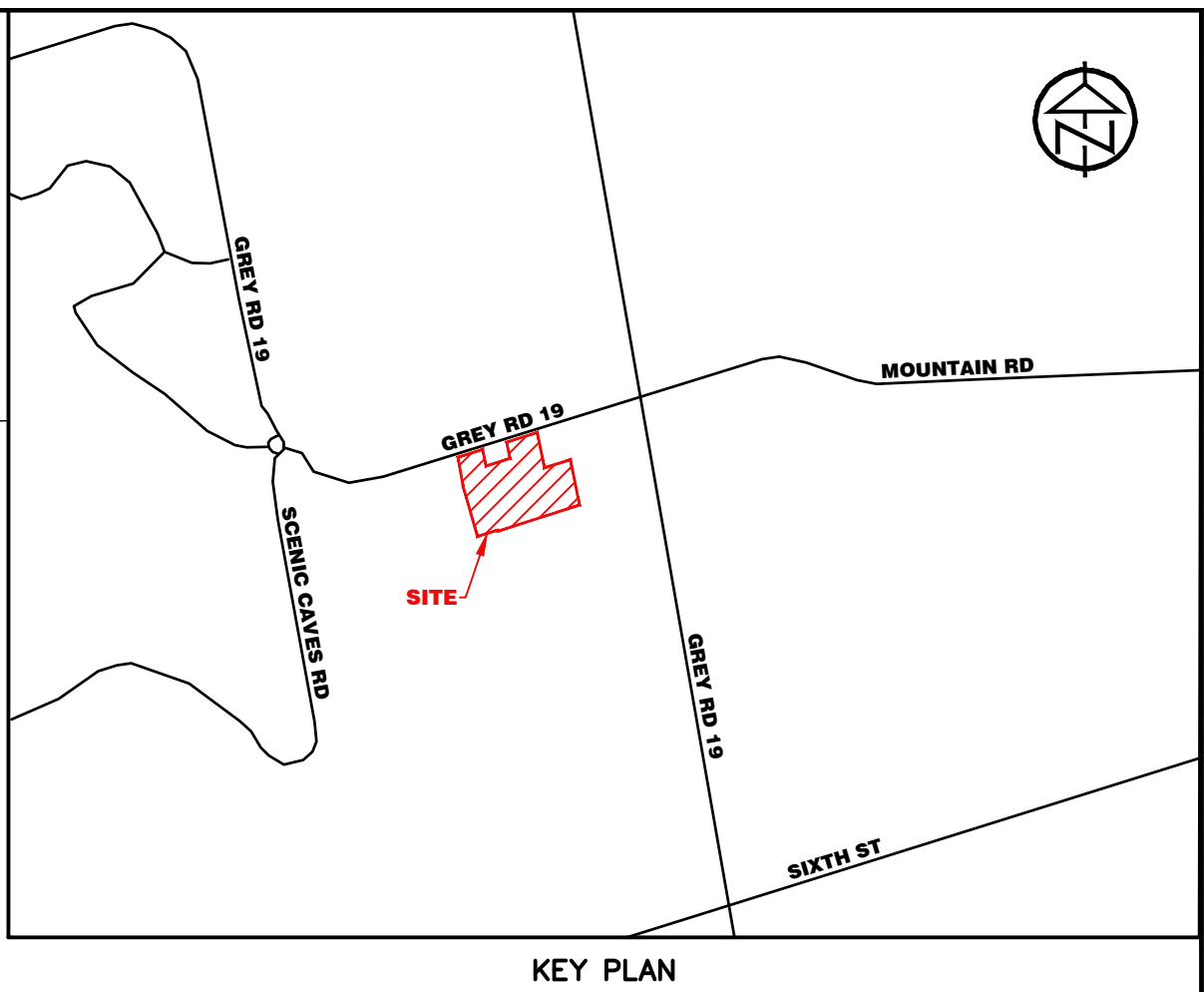
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			1.	DRAFT FOR CLIENT REVIEW	OCT 2025							
			2.	1ST SUBMISSION	NOV 2025							
								GENERAL SERVICING PLAN		DESIGN: JN	FILE: 123143	DWG:
										DRAWN: KH	DATE: AUG 2025	GS.1
										CHECK: RS	SCALE: 1:750	



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 TBM1 – ELEVATION 223.45m NAIL AND WASHER IN BELL POLE ON SOUTH SIDE OF GREY ROAD 19. BELL POLE IS LOCATED APPROX. 15.5m WEST OF DRIVEWAY (PROPERTY #796058) (FROM SURVEY DATED MAY 1, 2019) TBM2 – ELEVATION 224.33m NAIL AND WASHER IN HYDRO POLE ON NORTH SIDE OF GREY ROAD 19. HYDRO POLE IS LOCATED APPROX. 28m WEST OF THE CENTRE OF THE INTERSECTION OF CROSSWINDS BOULEVARD AND GREY ROAD 19. (FROM SURVEY DATED MAY 1, 2019)	NOTES TOPOGRAPHIC INFORMATION SHOWN ON THIS PLAN IS DERIVED FROM LIDAR DTM TILES SOURCED FROM THE GOVERNMENT OF ONTARIO GEOHUB AND COMBINED WITH SURVEY FROM MAY 2019 ALONG GREY ROAD 19 FOR ROUNDABOUT CONSTRUCTION	<table><tr><th>No.</th><th>REVISION DESCRIPTION</th><th>DATE</th></tr><tr><td>1.</td><td>DRAFT FOR CLIENT REVIEW</td><td>OCT 2025</td></tr><tr><td>2.</td><td>1ST SUBMISSION</td><td>NOV 2025</td></tr><tr><td> </td><td> </td><td> </td></tr></table>	No.	REVISION DESCRIPTION	DATE	1.	DRAFT FOR CLIENT REVIEW	OCT 2025	2.	1ST SUBMISSION	NOV 2025				ENGINEER STAMP	TOWN APPROVAL	<table><tr><td colspan="3">796060 GREY ROAD 19 TOWN OF THE BLUE MOUNTAINS</td></tr><tr><td colspan="3">  </td></tr><tr><td colspan="3">SANITARY DRAINAGE PLAN</td></tr><tr><td>DESIGN: JN</td><td>FILE: 123143</td><td>DWG: SAN.1</td></tr><tr><td>DRAWN: KH</td><td>DATE: AUG 2025</td><td></td></tr><tr><td>CHECK: RS</td><td>SCALE: 1:750</td><td></td></tr></table>	796060 GREY ROAD 19 TOWN OF THE BLUE MOUNTAINS						SANITARY DRAINAGE PLAN			DESIGN: JN	FILE: 123143	DWG: SAN.1	DRAWN: KH	DATE: AUG 2025		CHECK: RS	SCALE: 1:750	
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CHECK: RS	SCALE: 1:750																																			



- LEGEND**
- EXISTING ELEVATION
 - PROPOSED ELEVATION
 - PROPOSED WATERMAIN VALVE
 - PROPOSED SANITARY MAINTENANCE HOLE
 - FUTURE SANITARY MAINTENANCE HOLE (BY OTHERS)
- * 218.64
 * 220.32
 WV
 ● MHA5
 SW INV: 217.77
 E INV: 217.50
 ● MHA13
 SE INV: 217.52
 N INV: 217.47

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 TBM1 – ELEVATION 223.45m NAIL AND WASHER IN BELL POLE ON SOUTH SIDE OF GREY ROAD 19. BELL POLE IS LOCATED APPROX. 15.5m WEST OF DRIVEWAY (PROPERTY #796058) (FROM SURVEY DATED MAY 1, 2019) TBM2 – ELEVATION 224.33m NAIL AND WASHER IN HYDRO POLE ON NORTH SIDE OF GREY ROAD 19. HYDRO POLE IS LOCATED APPROX. 28m WEST OF THE CENTRE OF THE INTERSECTION OF CROSSWINDS BOULEVARD AND GREY ROAD 19. (FROM SURVEY DATED MAY 1, 2019)	NOTES TOPOGRAPHIC INFORMATION SHOWN ON THIS PLAN IS DERIVED FROM LIDAR DTM TILES SOURCED FROM THE GOVERNMENT OF ONTARIO GEOHUB AND COMBINED WITH SURVEY FROM MAY 2019 ALONG GREY ROAD 19 FOR ROUNDABOUT CONSTRUCTION	No.	REVISION DESCRIPTION	DATE	ENGINEER STAMP	TOWN APPROVAL	796060 GREY ROAD 19 TOWN OF THE BLUE MOUNTAINS				TATHAM ENGINEERING	
			1.	DRAFT FOR CLIENT REVIEW	OCT 2025								
			2.	1ST SUBMISSION	NOV 2025								
									SITE GRADING PLAN		DESIGN: JN	FILE: 123143	DWG:
											DRAWN: KH	DATE: AUG 2025	SG.1
											CHECK: RS	SCALE: 1:750	

Appendix A: Sanitary Sewage Calculations

PROJECT	796060 Grey Road 19	FILE	123143
		DATE	August 25, 2025
SUBJECT	Sewage Flow Unit Rates	NAME	J. Nemisz
		PAGE	1 OF 1

Flow Data (MH 41 - January 27, 2020 Flow Monitoring Report by Tatham)

Maximum Daily Flow (Measured): 161.6 m³/day
 No. Occupied Units at Max Day: 245 units
 Unit Occupancy Rate: 2.30 people per unit

Population : 564 people
 Maximum Daily Flow (Per Unit): 660 L/day
Maximum Daily Flow (Per Person): 287 L/day

Peak Flow Rate (Measured): 7.92 L/s (includes infiltration and peak residential flow)
 Average Daily Flow Rate (Measured): 1.47 L/s

Peaking Factor (Measured): 5.39

Infiltration Design Flow

Maximum No. of Units: 233 units (Minimum Observed Occupancy during Study)
 Population: 536 people

Peaking Factor (Harmon): 3.96
 Observed Peaking Factor: 5.39
 Observed Peak Flow: 7.92 L/s =

Peak Flow (Residential): 5.82 L/s
 Peak Flow (Infiltration): 2.10 L/s
 = 181,546 L/day
 = 779 L/unit/day
 = **339 L/person/day**

Project Information

796060 Grey Road 19 - Internal Sewers	123143
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Drawing Reference

123143 - SAN.1	November 06/25
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Prepared By

J. Nemisz	August 25/25
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Reviewed By

J. Suen	October 06/25
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Municipality

Town of The Blue Mountains

Population Density

Capita per Unit	Low	Medium	High
	2.15	2.15	2.15

Infiltration

Infiltration (L/s/ha)	0.28
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Manning's Coefficient

Pipe Material	Value
Concrete	0.013
PVC	0.013
Applied	0.013

Flow

Development Type	Average (L/cap/day)	Peaking Factor
Residential	350	Harmon

Development Type	Average (L/ha/day)	Peaking Factor
Institution	-	-
Commercial	-	-
Industrial (High)	-	-
Industrial (Low)	-	-

Notes

Design Flows based on Township Standards.

Version Date: November 6, 2025

Version Number: 2

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 (%)
BLDG. E, F, G & H	103	MHA1	MHA2	Residential	High	360	774.0	774.0	3.87	2.37	2.37	3.14	0.66	3.80	12.13	0.66	12.79	85.0	1.0%	200	1.04	32.80	0.93	140	39.0%
BLDG. E		MHA2	MHA3	Residential	High		0.0	774.0	3.87		2.37	3.14	0.66	3.80	12.13	0.66	12.79	26.0	0.5%	200	0.74	23.19	0.72	160	55.2%
		MHA3	MHA7	Residential	High		0.0	774.0	3.87		2.37	3.14	0.66	3.80	12.13	0.66	12.79	66.0	1.0%	200	1.04	32.80	0.93	140	39.0%
BLDG. A	102	BLDG A	MHA4	Residential	High	45	96.8	96.8	4.25	1.58	1.58	0.39	0.44	0.83	1.66	0.44	2.11	34.0	1.0%	200	1.04	32.80	0.57	71	6.4%
		MHA4	MHA5	Residential	High		0.0	96.8	4.25		1.58	0.39	0.44	0.83	1.66	0.44	2.11	42.0	0.5%	200	0.74	23.19	0.44	81	9.1%
		MHA5	MHA6	Residential	High		0.0	96.8	4.25		1.58	0.39	0.44	0.83	1.66	0.44	2.11	90.0	0.5%	200	0.74	23.19	0.44	81	9.1%
BLDG. B & Clubhouse		MHA6	MHA7	Residential	High	54	116.1	212.9	4.14		1.58	0.86	0.44	1.30	3.57	0.44	4.01	47.0	0.5%	200	0.74	23.19	0.53	104	17.3%
BLDG. C & D	101	MHA7	MHA8	Residential	High	144	309.6	1296.5	3.72	0.70	4.65	5.25	1.30	6.55	19.56	1.30	20.86	90.0	0.5%	250	0.86	42.05	0.82	192	49.6%
		MHA8	MHB6	Residential	High		0.0	1296.5	3.72		4.65	5.25	1.30	6.55	19.56	1.30	20.86	13.0	0.5%	250	0.86	42.05	0.82	192	49.6%
NE Corner of DD2 Development		MHA9	MHA10	Residential	High	224	481.6	481.6	3.98	14.94	14.94	1.95	4.18	6.13	7.77	4.18	11.95	63.0	0.5%	200	0.74	23.19	0.71	156	51.5%
		MHA10	MHA11	Residential	High		0.0	481.6	3.98		14.94	1.95	4.18	6.13	7.77	4.18	11.95	90.0	0.5%	200	0.74	23.19	0.71	156	51.5%
		MHA11	MHA12	Residential	High		0.0	481.6	3.98		14.94	1.95	4.18	6.13	7.77	4.18	11.95	70.0	0.5%	200	0.74	23.19	0.71	156	51.5%
		MHA12	MHA13	Residential	High		0.0	481.6	3.98		14.94	1.95	4.18	6.13	7.77	4.18	11.95	53.0	0.5%	200	0.74	23.19	0.71	156	51.5%
		MHA13	MHB4	Residential	High		0.0	481.6	3.98		14.94	1.95	4.18	6.13	7.77	4.18	11.95	67.0	0.5%	200	0.74	23.19	0.71	156	51.5%

Project Information

796060 Grey Road 19 - External Sewers

123143

Drawing Reference

123143 - SAN.2

November 06/25

Prepared By

J. Nemisz

August 25/25

Reviewed By

J. Suen

October 06/25

Municipality

Town of The Blue Mountains

Population Density

Capita per Unit

Low

Medium

High

2.15

2.15

2.15

Infiltration

Infiltration (L/s/ha)

0.28

Manning's Coefficient

Pipe Material

Value

Concrete

0.013

PVC

0.013

Applied

0.013

Development Type	Average (L/cap/day)	Peaking Factor
Residential	350	Harmon
Development Type	Average (L/ha/day)	Peaking Factor
Institution	-	-
Commercial	-	-
Industrial (High)	-	-
Industrial (Low)	-	-

Notes

1) Design Flows based on Township Standards.

2) Equivalent Area of 17.35 ha applied to achieve actual pumped flow rate of 4.86 L/s for Scandinave Spa via infiltration flows.

Version Date:

November 6, 2025

Version Number:

2

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 (%)
796074 Grey Road 19		MHB1A	MHB1	Residential	High	57	122.6	122.6	4.22	3.80	3.80	0.50	1.06	1.56	2.09	1.06	3.16	15.0	0.5%	200	0.74	23.19	0.50	95	13.6%
Grey Road 19		MHB1	MHB2	Residential	Low	0	0.0	122.6	4.22	0.00	3.80	0.50	1.06	1.56	2.09	1.06	3.16	40.0	0.5%	200	0.74	23.19	0.50	95	13.6%
Grey Road 19		MHB2	MHB3	Residential	Low	0	0.0	122.6	4.22	0.00	3.80	0.50	1.06	1.56	2.09	1.06	3.16	90.0	0.5%	200	0.74	23.19	0.50	95	13.6%
Grey Road 19		MHB3	MHB4	Residential	Low	0	0.0	122.6	4.22	0.00	3.80	0.50	1.06	1.56	2.09	1.06	3.16	60.0	0.5%	200	0.74	23.19	0.50	95	13.6%
NE Corner of DD2 Development		MHA13	MHB4	Residential	High	224	481.6	481.6	3.98	14.94	14.94	1.95	4.18	6.13	7.77	4.18	11.95	67.0	0.5%	200	0.74	23.19	0.71	156	51.5%
Grey Road 19		MHB4	MHB5	Residential	Low	1	2.2	606.3	3.93	0.18	18.92	2.46	5.30	7.75	9.65	5.30	14.95	90.0	0.5%	200	0.74	23.19	0.74	170	64.5%
Grey Road 19		MHB5	MHB6	Residential	Low	1	2.2	608.5	3.93	0.35	19.27	2.46	5.40	7.86	9.68	5.40	15.08	90.0	0.5%	200	0.74	23.19	0.74	170	65.0%
Proposed Site		MHA8	MHB6	Residential	High	603	1296.5	1296.5	3.72	4.65	4.65	5.25	1.30	6.55	19.56	1.30	20.86	13.0	0.5%	250	0.86	42.05	0.82	192	49.6%
Grey Road 19		MHB6	MHB7	Residential	Low	0	0.0	1904.9	3.60	0.00	23.92	7.72	6.70	14.41	27.80	6.70	34.49	87.0	0.5%	250	0.86	42.05	0.86	232	82.0%
Grey Road 19		MHB7	MHB8	Residential	Low	2	4.3	1909.2	3.60	1.28	25.20	7.73	7.06	14.79	27.85	7.06	34.91	90.0	0.5%	250	0.86	42.05	0.86	233	83.0%
Grey Road 19		MHB8	MHB9	Residential	Low	0	0.0	1909.2	3.60	0.00	25.20	7.73	7.06	14.79	27.85	7.06	34.91	90.0	0.5%	250	0.86	42.05	0.86	233	83.0%
795930 Grey Road 19		MHB9A	MHB9	Residential	High	52	111.8	111.8	4.23	3.46	3.46	0.45	0.97	1.42	1.92	0.97	2.88	15.0	0.5%	200	0.74	23.19	0.48	91	12.4%
Grey Road 19		MHB9	MHB10	Residential	Low	0	0.0	2021.0	3.58	0.00	28.65	8.19	8.02	16.21	29.33	8.02	37.35	90.0	0.5%	250	0.86	42.05	0.86	239	88.8%
Grey Road 19		MHB10	MHB11	Residential	Low	0	0.0	2021.0	3.58	0.00	28.65	8.19	8.02	16.21	29.33	8.02	37.35	30.0	0.5%	250	0.86	42.05	0.86	239	88.8%
Grey Road 19		MHB11	MH104	Residential	Low	0	0.0	2021.0	3.58	0.00	28.65	8.19	8.02	16.21	29.33	8.02	37.35	43.0	0.5%	250	0.86	42.05	0.86	239	88.8%
Castle Glen			F18	Residential	Low	2029	4362.4	4362.4	3.30	291.65	291.65	17.67	81.66	99.33	58.31	81.66	139.97	100.0	0.5%	375	1.12	123.98	1.12	392	112.9%

Project Information

796060 Grey Road 19 - External Sewers	123143
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Drawing Reference

123143 - SAN.2	November 06/25
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Prepared By

J. Nemisz	August 25/25
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Reviewed By

J. Suen	October 06/25
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Municipality

Town of The Blue Mountains

Population Density

Capita per Unit	Low	Medium	High
	2.15	2.15	2.15

Infiltration

Infiltration (L/s/ha)	0.28
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Manning's Coefficient

Pipe Material	Value
Concrete	0.013
PVC	0.013
Applied	0.013

Flow

Development Type	Average (L/cap/day)	Peaking Factor
Residential	350	Harmon

Development Type	Average (L/ha/day)	Peaking Factor
Institution	-	-
Commercial	-	-
Industrial (High)	-	-
Industrial (Low)	-	-

Notes

1) Design Flows based on Township Standards.
2) Equivalent Area of 17.35 ha applied to achieve actual pumped flow rate of 4.86 L/s for Scandinave Spa via infiltration flows.

Version Date: November 6, 2025

Version Number: 2

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 (%)
Grey Road 19		F18	F16	Residential	Low	0	0.0	4362.4	3.30	0.00	291.65	17.67	81.66	99.33	58.31	81.66	139.97	2970.0	4.3%	375	3.29	363.57	2.93	262	38.5%
Osler Properties			F17	Residential	Low	236	507.4	507.4	3.97	65.69	65.69	2.06	18.39	20.45	8.16	18.39	26.56	100.0	0.5%	200	0.74	23.19	0.74	210	114.5%
Grey Road 19		F17	F16	Residential	Low	0	0.0	507.4	3.97	0.00	65.69	2.06	18.39	20.45	8.16	18.39	26.56	360.0	1.6%	200	1.32	41.49	1.32	169	64.0%
Grey Road 19		F16	F15	Residential	Low	0	0.0	4869.8	3.26	0.00	357.34	19.73	100.06	119.78	64.22	100.06	164.28	1260.0	1.6%	375	2.01	221.78	2.01	335	74.1%
DD1			F15	Residential	Low	819	1760.9	1760.9	3.63	54.60	54.60	7.13	15.29	22.42	25.88	15.29	41.17	100.0	0.5%	200	0.74	23.19	0.74	248	177.5%
Grey Road 19		F15	F14	Residential	Low	0	0.0	6630.6	3.13	0.00	411.94	26.86	115.34	142.20	84.05	115.34	199.40	610.0	0.8%	375	1.37	151.84	1.37	415	131.3%
DD2			F14	Residential	Low	705	1515.8	1515.8	3.68	46.95	46.95	6.14	13.15	19.29	22.57	13.15	35.72	100.0	0.5%	250	0.86	42.05	0.86	235	84.9%
Grey Road 19		F14	MH101	Residential	Low	0	0.0	8146.4	3.04	0.00	458.89	33.00	128.49	161.49	100.40	128.49	228.89	1240.0	0.8%	375	1.37	151.84	1.37	437	150.7%
Grey Road 19		MH101	MH103	Residential	Low	0	0.0	8146.4	3.04	0.00	458.89	33.00	128.49	161.49	100.40	128.49	228.89	91.7	0.5%	375	1.12	123.98	1.12	472	184.6%
Slalom Gate Road to Grey Road 19		MH102	MH103	Residential	Low	0	0.0	0.0	4.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.7	0.5%	250	0.86	42.05	0.01	1	0.0%
Grey Road 19		MH103	MH104	Residential	Low	0	0.0	8146.4	3.04	0.00	458.89	33.00	128.49	161.49	100.40	128.49	228.89	98.5	0.5%	375	1.12	123.98	1.12	472	184.6%

Project Information

796060 Grey Road 19 - External Sewers	123143
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Drawing Reference

123143 - SAN.2	November 06/25
----------------	----------------

Prepared By

J. Nemisz	August 25/25
-----------	--------------

Reviewed By

J. Suen	October 06/25
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Municipality

Town of The Blue Mountains

Population Density

Capita per Unit	Low	Medium	High
	2.15	2.15	2.15

Infiltration

Infiltration (L/s/ha)	0.28
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Manning's Coefficient

Pipe Material	Value
Concrete	0.013
PVC	0.013
Applied	0.013

Flow

Development Type	Average (L/cap/day)	Peaking Factor
Residential	350	Harmon

Development Type	Average (L/ha/day)	Peaking Factor
Institution	-	-
Commercial	-	-
Industrial (High)	-	-
Industrial (Low)	-	-

Notes

1) Design Flows based on Township Standards.
2) Equivalent Area of 17.35 ha applied to achieve actual pumped flow rate of 4.86 L/s for Scandinave Spa via infiltration flows.

Version Date: November 6, 2025

Version Number: 2

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 (%)
Grey Road 21		MH104	MH105	Residential	Low	0	0.0	10167.4	2.95	0.00	487.54	41.19	136.51	177.70	121.40	136.51	257.91	94.7	1.0%	375	1.59	175.33	1.59	433	147.1%
Grey Road 21		MH105	MH106	Residential	Low	0	0.0	10167.4	2.95	0.00	487.54	41.19	136.51	177.70	121.40	136.51	257.91	96.3	1.5%	375	1.94	214.73	1.94	402	120.1%
Grey Road 21		MH106	MH107	Residential	Low	0	0.0	10167.4	2.95	0.00	487.54	41.19	136.51	177.70	121.40	136.51	257.91	66.8	1.5%	375	1.94	214.73	1.94	402	120.1%
Grey Road 21		MH107	E29	Residential	Low	0	0.0	10167.4	2.95	0.00	487.54	41.19	136.51	177.70	121.40	136.51	257.91	57.5	3.6%	375	3.01	332.67	3.01	341	77.5%
Price & Windfall			E29	Residential	Low	1113	2393.0	2393.0	3.52	102.77	102.77	9.69	28.78	38.47	34.16	28.78	62.94	83.9	0.5%	300	0.99	69.73	0.99	289	90.3%
Grey Road 21		E29	E28	Residential	Low	0	0.0	12560.3	2.86	0.00	590.31	50.88	165.29	216.17	145.30	165.29	310.59	93.9	0.8%	450	1.56	248.55	1.56	489	125.0%
Grey Road 21		E28	E27	Residential	Low	0	0.0	12560.3	2.86	0.00	590.31	50.88	165.29	216.17	145.30	165.29	310.59	90.0	0.8%	450	1.58	251.80	1.58	487	123.3%
Grey Road 21		E27	E26	Residential	Low	0	0.0	12560.3	2.86	0.00	590.31	50.88	165.29	216.17	145.30	165.29	310.59	85.0	0.9%	450	1.68	267.45	1.68	476	116.1%
LE Scandinave Spa			E26	Commercial			-	0.0	-	17.35	17.35		4.86	4.86		4.86	4.86	12.5	1.0%	200	1.04	32.80	0.72	98	14.8%
Grey Road 21		E26	E25	Residential	Low	0	0.0	12560.3	2.86	0.00	607.66	50.88	170.15	221.03	145.30	170.15	315.45	95.0	0.9%	450	1.65	262.85	1.65	482	120.0%
Grey Road 21		E25	E24	Residential	Low	0	0.0	12560.3	2.86	0.00	607.66	50.88	170.15	221.03	145.30	170.15	315.45	100.0	1.0%	450	1.77	280.80	1.77	470	112.3%
Grey Road 21		E24	E23	Residential	Low	0	0.0	12560.3	2.86	0.00	607.66	50.88	170.15	221.03	145.30	170.15	315.45	100.0	2.5%	450	2.81	447.17	2.81	395	70.5%
Blue Vista			E23	Residential	Low	154	331.1	331.1	4.06	12.27	12.27	1.34	3.44	4.78	5.45	3.44	8.88	77.4	3.4%	200	1.93	60.48	1.32	97	14.7%
Grey Road 21		E23	E22	Residential	Low	0	0.0	12891.4	2.84	0.00	619.93	52.22	173.58	225.80	148.54	173.58	322.12	95.0	2.5%	450	2.81	447.17	2.81	398	72.0%
Plateau East			E22	Residential	Low	39	83.9	83.9	4.26	6.01	6.01	0.34	1.68	2.02	1.45	1.68	3.13	13.8	0.5%	200	0.74	23.19	0.49	94	13.5%

Project Information

796060 Grey Road 19 - External Sewers	123143
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Drawing Reference

123143 - SAN.2	November 06/25
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Prepared By

J. Nemisz	August 25/25
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Reviewed By

J. Suen	October 06/25
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Municipality

Town of The Blue Mountains

Population Density

Capita per Unit	Low	Medium	High
	2.15	2.15	2.15

Infiltration

Infiltration (L/s/ha)	0.28
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Manning's Coefficient

Pipe Material	Value
Concrete	0.013
PVC	0.013
Applied	0.013

Flow

Development Type	Average (L/cap/day)	Peaking Factor
Residential	350	Harmon

Development Type	Average (L/ha/day)	Peaking Factor
Institution	-	-
Commercial	-	-
Industrial (High)	-	-
Industrial (Low)	-	-

Notes

1) Design Flows based on Township Standards.
2) Equivalent Area of 17.35 ha applied to achieve actual pumped flow rate of 4.86 L/s for Scandinave Spa via infiltration flows.

Version Date: November 6, 2025

Version Number: 2

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 (%)
Grey Road 21		E22	E21	Residential	Low	0	0.0	12975.3	2.84	0.00	625.94	52.56	175.26	227.83	149.36	175.26	324.62	95.0	2.7%	450	2.95	469.34	2.95	392	69.2%
Grey Road 21		E21	E20	Residential	Low	0	0.0	12975.3	2.84	0.00	625.94	52.56	175.26	227.83	149.36	175.26	324.62	100.0	4.1%	450	3.64	579.40	3.58	362	56.0%
Grey Road 21 + TOC		E20	E19	Residential	Low	20	43.0	13018.3	2.84	0.57	626.51	52.74	175.42	228.16	149.78	175.42	325.20	100.0	3.2%	450	3.22	512.40	3.22	379	63.5%
Grey Road 21		E19	E18	Residential	Low	0	0.0	13018.3	2.84		626.51	52.74	175.42	228.16	149.78	175.42	325.20	100.0	1.0%	450	1.77	282.24	1.77	474	115.2%
RR50 (Area 1)			E18	Residential	Low	36	77.4	77.4	4.27	7.20	7.20	0.31	2.02	2.33	1.34	2.02	3.36	100.0	0.5%	200	0.74	23.19	0.50	97	14.5%
Grey Road 21		E18	E17	Residential	Low	0	0.0	13095.7	2.84	0.00	633.71	53.05	177.44	230.49	150.53	177.44	327.97	100.0	1.0%	450	1.80	286.53	1.80	473	114.5%
Grey Road 21		E17	E16	Residential	Low	0	0.0	13095.7	2.84	0.00	633.71	53.05	177.44	230.49	150.53	177.44	327.97	85.2	1.0%	450	1.79	285.11	1.79	474	115.0%
Monterra Phase II			E13	Residential	Low	40	86.0	86.0	4.26	5.50	5.50	0.35	1.54	1.89	1.48	1.54	3.02	100.0	0.5%	200	0.74	23.19	0.49	93	13.0%
Grey Road 21		E16	E15	Residential	Low	0	0.0	13095.7	2.84	0.00	633.71	53.05	177.44	230.49	150.53	177.44	327.97	99.8	0.4%	525	1.26	272.00	1.26	563	120.6%
Grey Road 21		E15	E14	Residential	Low	0	0.0	13095.7	2.84	0.00	633.71	53.05	177.44	230.49	150.53	177.44	327.97	100.0	0.4%	525	1.26	272.00	1.26	563	120.6%
Grey Road 21		E14	E13	Residential	Low	0	0.0	13095.7	2.84	0.00	633.71	53.05	177.44	230.49	150.53	177.44	327.97	92.3	0.4%	525	1.22	265.11	1.22	568	123.7%
Grey Road 21		E13	E12	Residential	Low	0	0.0	13181.7	2.83	0.00	639.21	53.40	178.98	232.38	151.37	178.98	330.35	82.7	0.7%	525	1.69	364.92	1.69	506	90.5%
Grey Road 21		E12	E11	Residential	Low	0	0.0	13181.7	2.83	0.00	639.21	53.40	178.98	232.38	151.37	178.98	330.35	80.0	0.7%	525	1.64	354.64	1.64	511	93.2%
Grey Road 21		E11	E10	Residential	Low	0	0.0	13181.7	2.83	0.00	639.21	53.40	178.98	232.38	151.37	178.98	330.35	79.7	0.7%	525	1.71	369.95	1.71	503	89.3%
Grey Road 21		E10	E9	Residential	Low	0	0.0	13181.7	2.83	0.00	639.21	53.40	178.98	232.38	151.37	178.98	330.35	75.3	0.5%	525	1.36	294.84	1.36	548	112.0%

Project Information

796060 Grey Road 19 - External Sewers	123143
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Drawing Reference

123143 - SAN.2	November 06/25
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Prepared By

J. Nemisz	August 25/25
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Reviewed By

J. Suen	October 06/25
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Municipality

Town of The Blue Mountains

Population Density

Capita per Unit	Low	Medium	High
	2.15	2.15	2.15

Infiltration

Infiltration (L/s/ha)	0.28
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Manning's Coefficient

Pipe Material	Value
Concrete	0.013
PVC	0.013
Applied	0.013

Flow

Development Type	Average (L/cap/day)	Peaking Factor
Residential	350	Harmon

Development Type	Average (L/ha/day)	Peaking Factor
Institution	-	-
Commercial	-	-
Industrial (High)	-	-
Industrial (Low)	-	-

Notes

1) Design Flows based on Township Standards.
2) Equivalent Area of 17.35 ha applied to achieve actual pumped flow rate of 4.86 L/s for Scandinave Spa via infiltration flows.

Version Date: November 6, 2025

Version Number: 2

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 (%)
Grey Road 21		E9	E8	Residential	Low	0	0.0	13181.7	2.83	0.00	639.21	53.40	178.98	232.38	151.37	178.98	330.35	85.0	0.4%	525	1.30	282.01	1.30	557	117.1%
Grey Road 21		E8	E7	Residential	Low	0	0.0	13181.7	2.83	0.00	639.21	53.40	178.98	232.38	151.37	178.98	330.35	100.0	0.4%	525	1.19	258.04	1.19	576	128.0%
Grey Road 21		E7	E6	Residential	Low	0	0.0	13181.7	2.83	0.00	639.21	53.40	178.98	232.38	151.37	178.98	330.35	100.0	0.4%	525	1.24	268.57	1.24	567	123.0%
Grey Road 21		E6	E5	Residential	Low	0	0.0	13181.7	2.83	0.00	639.21	53.40	178.98	232.38	151.37	178.98	330.35	100.0	0.4%	525	1.22	265.11	1.22	570	124.6%
Grey Road 21		E5	E4	Residential	Low	0	0.0	13181.7	2.83	0.00	639.21	53.40	178.98	232.38	151.37	178.98	330.35	98.0	0.4%	525	1.21	261.60	1.21	573	126.3%
Grey Road 21		E4	E3	Residential	Low	0	0.0	13181.7	2.83	0.00	639.21	53.40	178.98	232.38	151.37	178.98	330.35	97.5	0.5%	525	1.43	310.12	1.43	537	106.5%
Long Point Road		E3	WWTP	Residential	Low	0	0.0	13181.7	2.83	0.00	639.21	53.40	178.98	232.38	151.37	178.98	330.35	400.0	0.5%	525	1.40	304.10	1.40	541	108.6%

Project Information

796060 Grey Road 19 - Internal Sewers	123143
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Drawing Reference

123143 - SAN.1	November 06/25
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Prepared By

J. Nemisz	August 25/25
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Reviewed By

J. Suen	October 06/25
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Municipality

Highway 26 Flow Monitoring Report - January 2020
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Population Density

Capita per Unit	Low	Medium	High
	2.30	2.30	2.30

Infiltration

Infiltration (L/cap/day)	339
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Manning's Coefficient

Pipe Material	Value
Concrete	0.013
PVC	0.013
Applied	0.013

Flow

Development Type	Average (L/cap/day)	Peaking Factor
Residential	287	Harmon

Development Type	Average (L/ha/day)	Peaking Factor
Institution	-	-
Commercial	28,000	1
Industrial (High)	-	-
Industrial (Low)	-	-

Notes

1) Unit Rate of 287 L/cap/day based on 660 L/unit/day monitored flow rate per 2020 Highway 26 Flow Monitoring Study.
2) Highway 26 Flow Monitoring Study derived a peaking factor of 5.39, including infiltration, for an observed peak flow of 7.92 L/s. The per capita infiltration rate of 339 L/cap/day is derived based on the difference in observed peak flow and calculated flow using the Harmon Equation, presuming minimum observed occupancy.

Version Date: November 6, 2025

Version Number: 2

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 (%)
BLDG. E, F, G & H	103	MHA1	MHA2	Residential	High	360	828.0	828.0	3.85	2.37	2.37	2.75	3.25	6.00	10.59	3.25	13.84	85.0	1.0%	200	1.04	32.80	0.95	145	42.2%
BLDG. E		MHA2	MHA3	Residential	High		0.0	828.0	3.85		2.37	2.75	3.25	6.00	10.59	3.25	13.84	26.0	0.5%	200	0.74	23.19	0.74	165	59.7%
		MHA3	MHA7	Residential	High		0.0	828.0	3.85		2.37	2.75	3.25	6.00	10.59	3.25	13.84	66.0	1.0%	200	1.04	32.80	0.95	145	42.2%
BLDG. A	102	BLDG A	MHA4	Residential	High	45	103.5	103.5	4.24	1.58	1.58	0.34	0.41	0.75	1.46	0.41	1.86	34.0	1.0%	200	1.04	32.80	0.55	68	5.7%
		MHA4	MHA5	Residential	High		0.0	103.5	4.24		1.58	0.34	0.41	0.75	1.46	0.41	1.86	42.0	0.5%	200	0.74	23.19	0.43	78	8.0%
		MHA5	MHA6	Residential	High		0.0	103.5	4.24		1.58	0.34	0.41	0.75	1.46	0.41	1.86	90.0	0.5%	200	0.74	23.19	0.43	78	8.0%
BLDG. B & Clubhouse		MHA6	MHA7	Residential	High	54	124.2	227.7	4.13		1.58	0.76	0.89	1.65	3.12	0.89	4.01	47.0	0.5%	200	0.74	23.19	0.53	104	17.3%
BLDG. C & D	101	MHA7	MHA8	Residential	High	144	331.2	1386.9	3.70	0.70	4.65	4.61	5.44	10.05	17.06	5.44	22.51	90.0	0.5%	250	0.86	42.05	0.83	198	53.5%
		MHA8	MHB6	Residential	High		0.0	1386.9	3.70		4.65	4.61	5.44	10.05	17.06	5.44	22.51	13.0	0.5%	250	0.86	42.05	0.83	198	53.5%
NE Corner of DD2 Development		MHA9	MHA10	Residential	High	224	515.2	515.2	3.97	14.94	14.94	1.71	2.02	3.73	6.79	2.02	8.81	63.0	0.5%	200	0.74	23.19	0.65	139	38.0%
		MHA10	MHA11	Residential	High		0.0	515.2	3.97		14.94	1.71	2.02	3.73	6.79	2.02	8.81	90.0	0.5%	200	0.74	23.19	0.65	139	38.0%
		MHA11	MHA12	Residential	High		0.0	515.2	3.97		14.94	1.71	2.02	3.73	6.79	2.02	8.81	70.0	0.5%	200	0.74	23.19	0.65	139	38.0%
		MHA12	MHA13	Residential	High		0.0	515.2	3.97		14.94	1.71	2.02	3.73	6.79	2.02	8.81	53.0	0.5%	200	0.74	23.19	0.65	139	38.0%
		MHA13	MHB4	Residential	High		0.0	515.2	3.97		14.94	1.71	2.02	3.73	6.79	2.02	8.81	67.0	0.5%	200	0.74	23.19	0.65	139	38.0%

Project Information

796060 Grey Road 19 - External Sewers	123143
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Drawing Reference

123143 - SAN.2	November 06/25
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Prepared By

J. Nemisz	August 25/25
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Reviewed By

J. Suen	October 06/25
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Municipality

Highway 26 Flow Monitoring Report - January 2020
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Population Density

Capita per Unit	Low	Medium	High
	2.30	2.30	2.30

Infiltration

Infiltration (L/cap/day)	339
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Manning's Coefficient

Pipe Material	Value
Concrete	0.013
PVC	0.013
Applied	0.013

Flow

Development Type	Average (L/cap/day)	Peaking Factor
Residential	287	Harmon

Development Type	Average (L/ha/day)	Peaking Factor
Institution	-	-
Commercial	28,000	1
Industrial (High)	-	-
Industrial (Low)	-	-

Notes

1) Unit Rate of 287 L/cap/day based on 660 L/unit/day monitored flow rate per 2020 Highway 26 Flow Monitoring Study.
2) Highway 26 Flow Monitoring Study derived a peaking factor of 5.39, including infiltration, for an observed peak flow of 7.92 L/s. The per capita infiltration rate of 339 L/cap/day is derived based on the difference in observed peak flow and calculated flow using the Harmon Equation, presuming minimum observed occupancy.
3) Equivalent area of 15 ha applied to achieve actual pumped flow rate of 4.86 L/s for Scandinave Spa.

Version Date: November 6, 2025

Version Number: 2

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 (%)
796074 Grey Road 19		MHB1A	MHB1	Residential	High	57	131.1	131.1	4.21	3.80	3.80	0.44	0.51	0.95	1.83	0.51	2.35	15.0	0.5%	200	0.74	23.19	0.46	85	10.1%
Grey Road 19		MHB1	MHB2	Residential	Low	0	0.0	131.1	4.21	0.00	3.80	0.44	0.51	0.95	1.83	0.51	2.35	40.0	0.5%	200	0.74	23.19	0.46	85	10.1%
Grey Road 19		MHB2	MHB3	Residential	Low	0	0.0	131.1	4.21	0.00	3.80	0.44	0.51	0.95	1.83	0.51	2.35	90.0	0.5%	200	0.74	23.19	0.46	85	10.1%
Grey Road 19		MHB3	MHB4	Residential	Low	0	0.0	131.1	4.21	0.00	3.80	0.44	0.51	0.95	1.83	0.51	2.35	60.0	0.5%	200	0.74	23.19	0.46	85	10.1%
NE Corner of DD2 Development		MHA13	MHB4	Residential	High	224	515.2	515.2	3.97	14.94	14.94	1.71	2.02	3.73	6.79	2.02	8.81	67.0	0.5%	200	0.74	23.19	0.65	139	38.0%
Grey Road 19		MHB4	MHB5	Residential	Low	1	2.3	648.6	3.91	0.18	18.92	2.15	2.54	4.70	8.43	2.54	10.98	90.0	0.5%	200	0.74	23.19	0.69	151	47.3%
Grey Road 19		MHB5	MHB6	Residential	Low	1	2.3	650.9	3.91	0.35	19.27	2.16	2.55	4.72	8.46	2.55	11.01	90.0	0.5%	200	0.74	23.19	0.69	151	47.5%
Proposed Site		MHA8	MHB6	Residential	High	603	1386.9	1386.9	3.70	4.65	4.65	4.61	5.44	10.05	17.06	5.44	22.51	13.0	0.5%	250	0.86	42.05	0.83	198	53.5%
Grey Road 19		MHB6	MHB7	Residential	Low	0	0.0	2037.8	3.58	0.00	23.92	6.77	8.00	14.76	24.23	8.00	32.23	87.0	0.5%	250	0.86	42.05	0.86	226	76.6%
Grey Road 19		MHB7	MHB8	Residential	Low	2	4.6	2042.4	3.58	1.28	25.20	6.78	8.01	14.80	24.28	8.01	32.29	90.0	0.5%	250	0.86	42.05	0.86	226	76.8%
Grey Road 19		MHB8	MHB9	Residential	Low	0	0.0	2042.4	3.58	0.00	25.20	6.78	8.01	14.80	24.28	8.01	32.29	90.0	0.5%	250	0.86	42.05	0.86	226	76.8%
795930 Grey Road 19		MHB9A	MHB9	Residential	High	52	119.6	119.6	4.22	3.46	3.46	0.40	0.47	0.87	1.68	0.47	2.15	15.0	0.5%	200	0.74	23.19	0.45	82	9.3%
Grey Road 19		MHB9	MHB10	Residential	Low	0	0.0	2162.0	3.56	0.00	28.65	7.18	8.48	15.66	25.56	8.48	34.04	90.0	0.5%	250	0.86	42.05	0.86	231	81.0%
Grey Road 19		MHB10	MHB11	Residential	Low	0	0.0	2162.0	3.56	0.00	28.65	7.18	8.48	15.66	25.56	8.48	34.04	30.0	0.5%	250	0.86	42.05	0.86	231	81.0%
Grey Road 19		MHB11	MH104	Residential	Low	0	0.0	2162.0	3.56	0.00	28.65	7.18	8.48	15.66	25.56	8.48	34.04	43.0	0.5%	250	0.86	42.05	0.86	231	81.0%
Castle Glen			F18	Residential	Low	2029	4666.7	4666.7	3.27	291.65	291.65	15.50	18.31	33.81	50.73	18.31	69.04	100.0	0.5%	375	1.12	123.98	1.10	301	55.7%

Project Information

796060 Grey Road 19 - External Sewers	123143
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Drawing Reference

123143 - SAN.2	November 06/25
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Prepared By

J. Nemisz	August 25/25
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Reviewed By

J. Suen	October 06/25
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Municipality

Highway 26 Flow Monitoring Report - January 2020
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Population Density

Capita per Unit	Low	Medium	High
	2.30	2.30	2.30

Infiltration

Infiltration (L/cap/day)	339
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Manning's Coefficient

Pipe Material	Value
Concrete	0.013
PVC	0.013
Applied	0.013

Flow

Development Type	Average (L/cap/day)	Peaking Factor
Residential	287	Harmon

Development Type	Average (L/ha/day)	Peaking Factor
Institution	-	-
Commercial	28,000	1
Industrial (High)	-	-
Industrial (Low)	-	-

Notes

1) Unit Rate of 287 L/cap/day based on 660 L/unit/day monitored flow rate per 2020 Highway 26 Flow Monitoring Study.
2) Highway 26 Flow Monitoring Study derived a peaking factor of 5.39, including infiltration, for an observed peak flow of 7.92 L/s. The per capita infiltration rate of 339 L/cap/day is derived based on the difference in observed peak flow and calculated flow using the Harmon Equation, presuming minimum observed occupancy.
3) Equivalent area of 15 ha applied to achieve actual pumped flow rate of 4.86 L/s for Scandinave Spa.

Version Date: November 6, 2025

Version Number: 2

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 (%)
Grey Road 19		F18	F16	Residential	Low	0	0.0	4666.7	3.27	0.00	291.65	15.50	18.31	33.81	50.73	18.31	69.04	2970.0	4.3%	375	3.29	363.57	2.42	201	19.0%
Osler Properties			F17	Residential	Low	236	542.8	542.8	3.96	65.69	65.69	1.80	2.13	3.93	7.13	2.13	9.26	100.0	0.5%	200	0.74	23.19	0.66	142	39.9%
Grey Road 19		F17	F16	Residential	Low	0	0.0	542.8	3.96	0.00	65.69	1.80	2.13	3.93	7.13	2.13	9.26	360.0	1.6%	200	1.32	41.49	1.01	114	22.3%
Grey Road 19		F16	F15	Residential	Low	0	0.0	5209.5	3.23	0.00	357.34	17.30	20.44	37.74	55.87	20.44	76.31	1260.0	1.6%	375	2.01	221.78	1.73	251	34.4%
DD1			F15	Residential	Low	819	1883.7	1883.7	3.61	54.60	54.60	6.26	7.39	13.65	22.56	7.39	29.95	100.0	0.5%	200	0.74	23.19	0.74	220	129.2%
Grey Road 19		F15	F14	Residential	Low	0	0.0	7093.2	3.10	0.00	411.94	23.56	27.83	51.39	73.07	27.83	100.90	610.0	0.8%	375	1.37	151.84	1.37	322	66.4%
DD2			F14	Residential	Low	705	1621.5	1621.5	3.65	46.95	46.95	5.39	6.36	11.75	19.69	6.36	26.05	100.0	0.5%	250	0.86	42.05	0.86	209	61.9%
Grey Road 19		F14	MH101	Residential	Low	0	0.0	8714.7	3.01	0.00	458.89	28.95	34.19	63.14	87.24	34.19	121.44	1240.0	0.8%	375	1.37	151.84	1.37	345	80.0%
Grey Road 19		MH101	MH103	Residential	Low	0	0.0	8714.7	3.01	0.00	458.89	28.95	34.19	63.14	87.24	34.19	121.44	91.7	0.5%	375	1.12	123.98	1.12	372	98.0%
Slalom Gate Road to Grey Road 19		MH102	MH103	Residential	Low	0	0.0	0.0	4.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.7	0.5%	250	0.86	42.05	0.01	0	0.0%
Grey Road 19		MH103	MH104	Residential	Low	0	0.0	8714.7	3.01	0.00	458.89	28.95	34.19	63.14	87.24	34.19	121.44	98.5	0.5%	375	1.12	123.98	1.12	372	98.0%

Project Information

796060 Grey Road 19 - External Sewers	123143
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Drawing Reference

123143 - SAN.2	November 06/25
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Prepared By

J. Nemisz	August 25/25
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Reviewed By

J. Suen	October 06/25
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Municipality

Highway 26 Flow Monitoring Report - January 2020
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Population Density

Capita per Unit	Low	Medium	High
	2.30	2.30	2.30

Infiltration

Infiltration (L/cap/day)	339
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Manning's Coefficient

Pipe Material	Value
Concrete	0.013
PVC	0.013
Applied	0.013

Flow

Development Type	Average (L/cap/day)	Peaking Factor
Residential	287	Harmon

Development Type	Average (L/ha/day)	Peaking Factor
Institution	-	-
Commercial	28,000	1
Industrial (High)	-	-
Industrial (Low)	-	-

Notes

1) Unit Rate of 287 L/cap/day based on 660 L/unit/day monitored flow rate per 2020 Highway 26 Flow Monitoring Study.
2) Highway 26 Flow Monitoring Study derived a peaking factor of 5.39, including infiltration, for an observed peak flow of 7.92 L/s. The per capita infiltration rate of 339 L/cap/day is derived based on the difference in observed peak flow and calculated flow using the Harmon Equation, presuming minimum observed occupancy.
3) Equivalent area of 15 ha applied to achieve actual pumped flow rate of 4.86 L/s for Scandinave Spa.

Version Date: November 6, 2025

Version Number: 2

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 (%)
Grey Road 21		MH104	MH105	Residential	Low	0	0.0	10876.7	2.92	0.00	487.54	36.13	42.68	78.81	105.44	42.68	148.11	94.7	1.0%	375	1.59	175.33	1.59	352	84.5%
Grey Road 21		MH105	MH106	Residential	Low	0	0.0	10876.7	2.92	0.00	487.54	36.13	42.68	78.81	105.44	42.68	148.11	96.3	1.5%	375	1.94	214.73	1.94	326	69.0%
Grey Road 21		MH106	MH107	Residential	Low	0	0.0	10876.7	2.92	0.00	487.54	36.13	42.68	78.81	105.44	42.68	148.11	66.8	1.5%	375	1.94	214.73	1.94	326	69.0%
Grey Road 21		MH107	E29	Residential	Low	0	0.0	10876.7	2.92	0.00	487.54	36.13	42.68	78.81	105.44	42.68	148.11	57.5	3.6%	375	3.01	332.67	2.78	277	44.5%
Price & Windfall			E29	Residential	Low	1113	2559.9	2559.9	3.50	102.77	102.77	8.50	10.04	18.55	29.76	10.04	39.81	83.9	0.5%	300	0.99	69.73	0.98	243	57.1%
Grey Road 21		E29	E28	Residential	Low	0	0.0	13436.6	2.83	0.00	590.31	44.63	52.72	97.35	126.15	52.72	178.87	93.9	0.8%	450	1.56	248.55	1.56	398	72.0%
Grey Road 21		E28	E27	Residential	Low	0	0.0	13436.6	2.83	0.00	590.31	44.63	52.72	97.35	126.15	52.72	178.87	90.0	0.8%	450	1.58	251.80	1.58	396	71.0%
Grey Road 21		E27	E26	Residential	Low	0	0.0	13436.6	2.83	0.00	590.31	44.63	52.72	97.35	126.15	52.72	178.87	85.0	0.9%	450	1.68	267.45	1.68	387	66.9%
LE Scandinave Spa			E26	Commercial			-	0.0	1.00	15.00	15.00	4.86		4.86	4.86		4.86	12.5	1.0%	200	1.04	32.80	0.72	98	14.8%
Grey Road 21		E26	E25	Residential	Low	0	0.0	13436.6	2.83	0.00	605.31	49.49	52.72	102.21	131.01	52.72	183.73	95.0	0.9%	450	1.65	262.85	1.65	393	69.9%
Grey Road 21		E25	E24	Residential	Low	0	0.0	13436.6	2.83	0.00	605.31	49.49	52.72	102.21	131.01	52.72	183.73	100.0	1.0%	450	1.77	280.80	1.77	384	65.4%
Grey Road 21		E24	E23	Residential	Low	0	0.0	13436.6	2.83	0.00	605.31	49.49	52.72	102.21	131.01	52.72	183.73	100.0	2.5%	450	2.81	447.17	2.54	322	41.1%
Blue Vista			E23	Residential	Low	154	354.2	354.2	4.05	12.27	12.27	1.18	1.39	2.57	4.76	1.39	6.15	77.4	3.4%	200	1.93	60.48	1.19	85	10.2%
Grey Road 21		E23	E22	Residential	Low	0	0.0	13790.8	2.81	0.00	617.58	50.67	54.11	104.78	133.81	54.11	187.92	95.0	2.5%	450	2.81	447.17	2.56	325	42.0%
Plateau East			E22	Residential	Low	39	89.7	89.7	4.26	6.01	6.01	0.30	0.35	0.65	1.27	0.35	1.62	13.8	0.5%	200	0.74	23.19	0.41	74	7.0%

Project Information

796060 Grey Road 19 - External Sewers	123143
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Drawing Reference

123143 - SAN.2	November 06/25
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Prepared By

J. Nemisz	August 25/25
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Reviewed By

J. Suen	October 06/25
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Municipality

Highway 26 Flow Monitoring Report - January 2020
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Population Density

Capita per Unit	Low	Medium	High
	2.30	2.30	2.30

Infiltration

Infiltration (L/cap/day)	339
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Manning's Coefficient

Pipe Material	Value
Concrete	0.013
PVC	0.013
Applied	0.013

Flow

Development Type	Average (L/cap/day)	Peaking Factor
Residential	287	Harmon

Development Type	Average (L/ha/day)	Peaking Factor
Institution	-	-
Commercial	28,000	1
Industrial (High)	-	-
Industrial (Low)	-	-

Notes

1) Unit Rate of 287 L/cap/day based on 660 L/unit/day monitored flow rate per 2020 Highway 26 Flow Monitoring Study.
2) Highway 26 Flow Monitoring Study derived a peaking factor of 5.39, including infiltration, for an observed peak flow of 7.92 L/s. The per capita infiltration rate of 339 L/cap/day is derived based on the difference in observed peak flow and calculated flow using the Harmon Equation, presuming minimum observed occupancy.
3) Equivalent area of 15 ha applied to achieve actual pumped flow rate of 4.86 L/s for Scandinave Spa.

Version Date: November 6, 2025

Version Number: 2

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 (%)
Grey Road 21		E22	E21	Residential	Low	0	0.0	13880.5	2.81	0.00	623.59	50.97	54.46	105.43	134.52	54.46	188.98	95.0	2.7%	450	2.95	469.34	2.65	320	40.3%
Grey Road 21		E21	E20	Residential	Low	0	0.0	13880.5	2.81	0.00	623.59	50.97	54.46	105.43	134.52	54.46	188.98	100.0	4.1%	450	3.64	579.40	3.10	296	32.6%
Grey Road 21 + TOC		E20	E19	Residential	Low	20	46.0	13926.5	2.81	0.57	624.16	51.12	54.64	105.76	134.89	54.64	189.53	100.0	3.2%	450	3.22	512.40	2.83	310	37.0%
Grey Road 21		E19	E18	Residential	Low	0	0.0	13926.5	2.81		624.16	51.12	54.64	105.76	134.89	54.64	189.53	100.0	1.0%	450	1.77	282.24	1.77	387	67.2%
RR50 (Area 1)			E18	Residential	Low	36	82.8	82.8	4.27	7.20	7.20	0.28	0.32	0.60	1.17	0.32	1.50	100.0	0.5%	200	0.74	23.19	0.41	72	6.5%
Grey Road 21		E18	E17	Residential	Low	0	0.0	14009.3	2.81	0.00	631.36	51.40	54.97	106.36	135.54	54.97	190.50	100.0	1.0%	450	1.80	286.53	1.80	386	66.5%
Grey Road 21		E17	E16	Residential	Low	0	0.0	14009.3	2.81	0.00	631.36	51.40	54.97	106.36	135.54	54.97	190.50	85.2	1.0%	450	1.79	285.11	1.79	387	66.8%
Monterra Phase II			E13	Residential	Low	40	92.0	92.0	4.25	5.50	5.50	0.31	0.36	0.67	1.30	0.36	1.66	100.0	0.5%	200	0.74	23.19	0.42	74	7.2%
Grey Road 21		E16	E15	Residential	Low	0	0.0	14009.3	2.81	0.00	631.36	51.40	54.97	106.36	135.54	54.97	190.50	99.8	0.4%	525	1.26	272.00	1.26	459	70.0%
Grey Road 21		E15	E14	Residential	Low	0	0.0	14009.3	2.81	0.00	631.36	51.40	54.97	106.36	135.54	54.97	190.50	100.0	0.4%	525	1.26	272.00	1.26	459	70.0%
Grey Road 21		E14	E13	Residential	Low	0	0.0	14009.3	2.81	0.00	631.36	51.40	54.97	106.36	135.54	54.97	190.50	92.3	0.4%	525	1.22	265.11	1.22	464	71.9%
Grey Road 21		E13	E12	Residential	Low	0	0.0	14101.3	2.81	0.00	636.86	51.70	55.33	107.03	136.26	55.33	191.59	82.7	0.7%	525	1.69	364.92	1.63	412	52.5%
Grey Road 21		E12	E11	Residential	Low	0	0.0	14101.3	2.81	0.00	636.86	51.70	55.33	107.03	136.26	55.33	191.59	80.0	0.7%	525	1.64	354.64	1.60	417	54.0%
Grey Road 21		E11	E10	Residential	Low	0	0.0	14101.3	2.81	0.00	636.86	51.70	55.33	107.03	136.26	55.33	191.59	79.7	0.7%	525	1.71	369.95	1.65	410	51.8%
Grey Road 21		E10	E9	Residential	Low	0	0.0	14101.3	2.81	0.00	636.86	51.70	55.33	107.03	136.26	55.33	191.59	75.3	0.5%	525	1.36	294.84	1.36	446	65.0%

Project Information

796060 Grey Road 19 - External Sewers

123143

Drawing Reference

123143 - SAN.2

November 06/25

Prepared By

J. Nemisz

August 25/25

Reviewed By

J. Suen

October 06/25

Municipality

Highway 26 Flow Monitoring Report - January 2020

Population Density

Capita per Unit

Low

Medium

High

2.30

2.30

2.30

Infiltration

Infiltration (L/cap/day)

339

Manning's Coefficient

Pipe Material

Value

Concrete

0.013

PVC

0.013

Applied

0.013

Development Type	Average (L/cap/day)	Peaking Factor
Residential	287	Harmon
Development Type	Average (L/ha/day)	Peaking Factor
Institution	-	-
Commercial	28,000	1
Industrial (High)	-	-
Industrial (Low)	-	-

Notes

1) Unit Rate of 287 L/cap/day based on 660 L/unit/day monitored flow rate per 2020 Highway 26 Flow Monitoring Study.

2) Highway 26 Flow Monitoring Study derived a peaking factor of 5.39, including infiltration, for an observed peak flow of 7.92 L/s. The per capita infiltration rate of 339 L/cap/day is derived based on the difference in observed peak flow and calculated flow using the Harmon Equation, presuming minimum observed occupancy.

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Version Date:

November 6, 2025

Version Number:

2

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 (%)
Grey Road 21		E9	E8	Residential	Low	0	0.0	14101.3	2.81	0.00	636.86	51.70	55.33	107.03	136.26	55.33	191.59	85.0	0.4%	525	1.30	282.01	1.30	454	67.9%
Grey Road 21		E8	E7	Residential	Low	0	0.0	14101.3	2.81	0.00	636.86	51.70	55.33	107.03	136.26	55.33	191.59	100.0	0.4%	525	1.19	258.04	1.19	469	74.2%
Grey Road 21		E7	E6	Residential	Low	0	0.0	14101.3	2.81	0.00	636.86	51.70	55.33	107.03	136.26	55.33	191.59	100.0	0.4%	525	1.24	268.57	1.24	462	71.3%
Grey Road 21		E6	E5	Residential	Low	0	0.0	14101.3	2.81	0.00	636.86	51.70	55.33	107.03	136.26	55.33	191.59	100.0	0.4%	525	1.22	265.11	1.22	465	72.3%
Grey Road 21		E5	E4	Residential	Low	0	0.0	14101.3	2.81	0.00	636.86	51.70	55.33	107.03	136.26	55.33	191.59	98.0	0.4%	525	1.21	261.60	1.21	467	73.2%
Grey Road 21		E4	E3	Residential	Low	0	0.0	14101.3	2.81	0.00	636.86	51.70	55.33	107.03	136.26	55.33	191.59	97.5	0.5%	525	1.43	310.12	1.43	438	61.8%
Long Point Road		E3	WWTP	Residential	Low	0	0.0	14101.3	2.81	0.00	636.86	51.70	55.33	107.03	136.26	55.33	191.59	400.0	0.5%	525	1.40	304.10	1.40	441	63.0%

Appendix B: FUS Calculations

	Project: 796060 Grey Road 19, Blue Mountains	Date: November 6, 2025
	File No.: 123143	Designed: JN
	Subject: Fire Flow Calculations Building A	Checked: JA
	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	Coefficient related to type of construction (C)	Framing Material							
			Type V - Wood Frame Construction	1.5	Type IVB - Mass Timber Construction	0.9	%	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					1161	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%	1742			
		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					2903			
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})							11,000	
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	%	(1,650)	9,350	
			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.			-0.4	%	(3,740)	5,610	
			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	Yes					
			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	Greater than 30.0 m	0.00	0	%	-	5,610	
			East Side	Greater than 30.0 m	0.00					
			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	5,610	
			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:									6,000	
5	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 (m³):					720			

	Project: 796060 Grey Road 19, Blue Mountains	Date: November 6, 2025
	File No.: 123143	Designed: JN
	Subject: Fire Flow Calculations Building B	Checked: JA
	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	Coefficient related to type of construction (C)	Framing Material						
			Type V - Wood Frame Construction	1.5	Type IVB - Mass Timber Construction	0.9	%	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				1161	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%	2323					
		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				3484			
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})						12,000	
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	%	(1,800)	10,200
			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.			-0.4	%	(4,080)	6,120
			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	Yes				
			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	Greater than 30.0 m	0.00	0	%	-	6,120
			East Side	Greater than 30.0 m	0.00				
			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	6,120
			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:									6,000
5	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 (m³):					720		

	Project: 796060 Grey Road 19, Blue Mountains	Date: November 6, 2025
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	Subject: Fire Flow Calculations Building C	Checked: JA
	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	Coefficient related to type of construction (C)	Framing Material						
			Type V - Wood Frame Construction	1.5	Type IVB - Mass Timber Construction	0.9	%	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				1161	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%	2323					
		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				3484			
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})						12,000	
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	%	(1,800)	10,200
			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.			-0.4	%	(4,080)	6,120
			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	Yes				
			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	Greater than 30.0 m	0.00	0.2	%	2,040	8,160
			East Side	20.1 to 30.0 m	0.10				
			South Side	Greater than 30.0 m	0.00				
			West Side	20.1 to 30.0 m	0.10				
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	8,160
			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 (m³):						960	

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	File No.: 123143	Designed: JN
	Subject: Fire Flow Calculations Building D	Checked: JA
	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	Coefficient related to type of construction (C)	Framing Material						
			Type V - Wood Frame Construction	1.5	Type IVB - Mass Timber Construction	0.9	%	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				1161	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%			3484
		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				4645			
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.			-0.4	%	(4,420)	6,630
			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	Yes				
			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	Greater than 30.0 m	0.00	0.1	%	1,105	7,735
			East Side	Greater than 30.0 m	0.00				
			South Side	Greater than 30.0 m	0.00				
			West Side	20.1 to 30.0 m	0.10				
			4.4	Combustibility of Wood Shingle or Shake Roof Material	Surcharge for potential to spread fire				
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 (m³):					960		

	Project: 796060 Grey Road 19, Blue Mountains	Date: November 6, 2025
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	Subject: Fire Flow Calculations Building E	Checked: JA
	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	Coefficient related to type of construction (C)	Framing Material				0.9	%	N/A	
			Type V - Wood Frame Construction	1.5	Type IVB - Mass Timber Construction					
			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				1161	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%				3484
		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				4645				
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.		Yes	-0.4	%	(4,420)	6,630	
			a) Automatic sprinkler protection designed and installed in accordance with NFPA 13	-0.3						
			b) Water supply is standard for both the system and the Fire Department hose lines	-0.1						
			c) Fully supervised system	-0.1						
				0.0						
				0.0						
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	%	-	6,630	
			East Side	Greater than 30.0 m	0.00					
			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	6,630	
			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:									7,000	
5	Required Fire Flow, Duration and Volume	Total Required Fire Flow (above) in L/s:							117	
		Required Duration of Fire Flow of 7,000 L/min (hrs):					2			
		Required volume for Fire Flow of 7,000 L/min (m ³):					840			

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	File No.: 123143	Designed: JN
	Subject: Fire Flow Calculations Building F	Checked: JA
	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	Coefficient related to type of construction (C)	Framing Material						%	N/A
			Type V - Wood Frame Construction	1.5	Type IVB - Mass Timber Construction	0.9				
			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				1161	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%			3484	
		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				4645				
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.			-0.4	%	(4,420)	6,630	
			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	Yes					
			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	Greater than 30.0 m	0.00	0.1	%	1,105	7,735	
			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	7,735	
			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 (m³):					960			

	Project: 796060 Grey Road 19, Blue Mountains	Date: November 6, 2025
	File No.: 123143	Designed: JN
	Subject: Fire Flow Calculations Building G	Checked: JA
	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	Coefficient related to type of construction (C)	Framing Material				0.9	%	N/A	
			Type V - Wood Frame Construction	1.5	Type IVB - Mass Timber Construction					
			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				1161	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%	3484						
		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				4645				
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.			-0.4	%	(4,420)	6,630	
			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	Yes					
			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	%	2,210	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):							2	
		Required volume for Fire Flow of 9,000 L/min (m ³):							1,080	

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	Subject: Fire Flow Calculations Building H	Checked: JA
	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	Coefficient related to type of construction (C)	Framing Material						%	N/A
			Type V - Wood Frame Construction	1.5	Type IVB - Mass Timber Construction	0.9				
			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				1161	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%			3484	
		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				4645				
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.			-0.4	%	(4,420)	6,630	
			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	Yes					
			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	0.1	%	1,105	7,735	
			East Side	Greater than 30.0 m	0.00					
			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	7,735	
			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 C: Water Servicing Calculations

PROJECT	796060 Grey Road 19, Blue Mountains	FILE	123143		
		DATE	6-Nov-2025		
SUBJECT	Water Supply Calculations Building A	NAME	JN	CHECK	JA
		PAGE	1	OF	2

SITE DESCRIPTION

Residential development consisting of 8 buildings with 45 to 90 units per building for a total of 603 units.

Servicing provided through private watermain and two connections per building:

- one dedicated domestic service; and
- one dedicated fire protection service.

DAILY DEMAND DESIGN PARAMATERS

Pop. Density	2.15	people/unit	Q = Px Dx PF, where:
Demand	350	L/person/day	P = Population
Units per Service	45	= 96.8 people	D = Per Cap. Demand
Total Units	827	= 1,778.1 people	PF = Peaking Factor
Fire Flow	100	L/s	

Design Demand	Per Service		Total	
	L/day	L/s	L/day	L/s
Average Daily	33,880	0.39	622,335	7.20
Max Day Factors	7.00		2.60	
Maximum Day	237,160	2.74	1,618,071	18.73
Peak Hour Factors	10.50		3.90	
Peak Hour	355,740	4.12	2,427,107	28.09

WATERMAIN SERVICE SIZING AND FRICTION LOSS

					Maximum Day Demand + Fire Flow				Peak Hour Demand				Comb. Service
Service Type	D (mm)	C	L (m)	A (m ²)	Q (L/s)	V (m/s)	Friction Loss		Q (L/s)	V (m/s)	Friction Loss		
							(m)	kPa			(m)	kPa	
Domestic Service	75	100	32.0	0.0045	2.74	0.61	0.37	3.7	4.12	0.92	0.79	7.8	
Fire Prot. Service	200	110	32.0	0.0315	100.00	3.18	2.03	20.0					No
West Branch	250	110	22.0	0.0491	118.73	2.42	0.65	6.4	28.09	0.58	0.05	0.5	

Notes: - A = $(\pi D^2)/4$; where D is converted to m.

- V = Q/A; where Q is converted to m³/s.

- $h_f = L \times \left(\frac{Q}{0.278 \times C \times D^{2.63}} \right)^{1/0.54}$; where Q is converted to m³/s.

D - Pipe Diameter

Q - Demand Flow

A - Pipe Flow Area

V - Flow Velocity

C - Pipe Coefficient

L - Pipe Length

PROJECT	796060 Grey Road 19, Blue Mountains	FILE	123143		
		DATE	6-Nov-2025		
SUBJECT	Water Supply Calculations Building A	NAME	JN	CHECK	JA
		PAGE	2	OF	2

STATIC HEAD LOSS

	Road C/L Elev (m)	Depth to W/M (m)	Finished Grade (m)	Depth to W/M (m)	Total Head Loss	
					(m)	(kPa)
Static Head Loss	222.50	1.80	222.80	1.80	0.30	2.95

TOTAL LOSSES - MAXIMUM DAY DEMAND PLUS FIRE FLOW

Service Type	Static Pressure (kPa)	Static Loss (kPa)	W/M Loss (kPa)	Service Loss (kPa)	Total Loss (kPa)	Service Pressure (kPa)
West Branch	350.00	2.95	6.40		9.35	340.65
Fire Prot. Service	340.65			20.00	20.00	320.65

Meets minimum recommended pressure during maximum day plus fire flow (140 kPa).

TOTAL LOSSES - PEAK DAILY FLOW

Service Type	Static Pressure (kPa)	Static Loss (kPa)	W/M Loss (kPa)	Service Loss (kPa)	Total Loss (kPa)	Service Pressure (kPa)
West Branch	275.00	2.95	0.50		3.45	271.55
Domestic Service	271.55			7.80	7.80	263.75

Meets minimum recommended pressure of service at exterior building face (200 kPa).

PROJECT	796060 Grey Road 19, Blue Mountains	FILE	123143		
		DATE	6-Nov-2025		
SUBJECT	Water Supply Calculations Building B	NAME	JN	CHECK	JA
		PAGE	1	OF	2

SITE DESCRIPTION

Residential development consisting of 8 buildings with 45 to 90 units per building for a total of 603 units.

Servicing provided through private watermain and two connections per building:

- one dedicated domestic service; and
- one dedicated fire protection service.

DAILY DEMAND DESIGN PARAMATERS

Pop. Density	2.15	people/unit	Q = Px Dx PF, where:
Demand	350	L/person/day	P = Population
Units per Service	54	= 116.1 people	D = Per Cap. Demand
Total Units	827	= 1,778.1 people	PF = Peaking Factor
Fire Flow	100	L/s	

Design Demand	Per Service		Total	
	L/day	L/s	L/day	L/s
Average Daily	40,635	0.47	622,335	7.20
Max Day Factors	6.20		2.60	
Maximum Day	251,937	2.92	1,618,071	18.73
Peak Hour Factors	9.40		3.90	
Peak Hour	381,969	4.42	2,427,107	28.09

WATERMAIN SERVICE SIZING AND FRICTION LOSS

					Maximum Day Demand + Fire Flow				Peak Hour Demand				Comb. Service
Service Type	D (mm)	C	L (m)	A (m ²)	Q (L/s)	V (m/s)	Friction Loss		Q (L/s)	V (m/s)	Friction Loss		
							(m)	kPa			(m)	kPa	
Domestic Service	75	100	24.0	0.0045	2.92	0.65	0.31	3.1	4.42	0.99	0.67	6.6	
Fire Prot. Service	200	110	24.0	0.0315	100.00	3.18	1.52	15.0					No
West Branch	250	110	282.0	0.0491	46.73	0.96	1.48	14.6	11.03	0.23	0.11	1.1	
East Branch South	150	100	234.0	0.0177	46.73	2.64	17.55	172.1	11.03	0.63	1.22	12.0	
East Branch North	150	100	114.0	0.0177	72.00	4.07	19.04	186.7	17.06	0.97	1.33	13.1	

Notes: - A = $(\pi D^2)/4$; where D is converted to m.

- V = Q/A; where Q is converted to m³/s.

- $h_f = L \times \left(\frac{Q}{0.278 \times C \times D^{2.63}} \right)^{1/0.54}$; where Q is converted to m³/s.

D - Pipe Diameter

Q - Demand Flow

A - Pipe Flow Area

V - Flow Velocity

C - Pipe Coefficient

L - Pipe Length

PROJECT	796060 Grey Road 19, Blue Mountains	FILE	123143		
		DATE	6-Nov-2025		
SUBJECT	Water Supply Calculations Building B	NAME	JN	CHECK	JA
		PAGE	2	OF	2

STATIC HEAD LOSS

	Road C/L Elev (m)	Depth to W/M (m)	Finished Grade (m)	Depth to W/M (m)	Total Head Loss	
					(m)	(kPa)
Static Head Loss	222.50	1.80	222.80	1.80	0.30	2.95

TOTAL LOSSES - MAXIMUM DAY DEMAND PLUS FIRE FLOW

Service Type	Static Pressure (kPa)	Static Loss (kPa)	W/M Loss (kPa)	Service Loss (kPa)	Total Loss (kPa)	Service Pressure (kPa)
West Branch	350.00	2.95	14.60		17.55	332.45
East Branch South	332.45		172.10		172.10	160.35
East Branch North	350.00	2.95	186.70		189.65	160.35
Fire Prot. Service	160.35			15.00	15.00	145.35

Meets minimum recommended pressure during maximum day plus fire flow (140 kPa).

TOTAL LOSSES - PEAK DAILY FLOW

Service Type	Static Pressure (kPa)	Static Loss (kPa)	W/M Loss (kPa)	Service Loss (kPa)	Total Loss (kPa)	Service Pressure (kPa)
West Branch	275.00	2.95	1.10		4.05	270.95
East Branch South	270.95		12.00		12.00	258.95
East Branch North	275.00	2.95	13.10		16.05	258.95
Domestic Service	258.95			6.60	6.60	252.35

Meets minimum recommended pressure of service at exterior building face (200 kPa).

PROJECT	796060 Grey Road 19, Blue Mountains	FILE	123143
		DATE	6-Nov-2025
SUBJECT	Water Supply Calculations Building C	NAME	JN
		CHECK	JA
		PAGE	1
		OF	2

SITE DESCRIPTION

Residential development consisting of 8 buildings with 45 to 90 units per building for a total of 603 units.

Servicing provided through private watermain and two connections per building:

- one dedicated domestic service; and
- one dedicated fire protection service.

DAILY DEMAND DESIGN PARAMATERS

Pop. Density	2.15	people/unit	Q = Px Dx PF, where:
Demand	350	L/person/day	P = Population
Units per Service	54	= 116.1 people	D = Per Cap. Demand
Total Units	827	= 1,778.1 people	PF = Peaking Factor
Fire Flow	133	L/s	

Design Demand	Per Service		Total	
	L/day	L/s	L/day	L/s
Average Daily	40,635	0.47	622,335	7.20
Max Day Factors	6.20		2.60	
Maximum Day	251,937	2.92	1,618,071	18.73
Peak Hour Factors	9.40		3.90	
Peak Hour	381,969	4.42	2,427,107	28.09

WATERMAIN SERVICE SIZING AND FRICTION LOSS

					Maximum Day Demand + Fire Flow				Peak Hour Demand				Comb. Service
Service Type	D (mm)	C	L (m)	A (m ²)	Q (L/s)	V (m/s)	Friction Loss		Q (L/s)	V (m/s)	Friction Loss		
							(m)	kPa			(m)	kPa	
Domestic Service	75	100	1.5	0.0045	2.92	0.65	0.02	0.2	4.42	0.99	0.05	0.5	
Fire Prot. Service	200	110	1.5	0.0315	133.00	4.23	0.17	1.7					No
West Branch	250	110	282.0	0.0491	27.71	0.57	0.56	5.5	4.99	0.11	0.03	0.3	
East Branch South	200	110	322.0	0.0315	27.71	0.88	1.90	18.7	4.99	0.16	0.08	0.8	
East Branch North	200	110	26.0	0.0315	124.02	3.94	2.46	24.2	23.10	0.74	0.11	1.1	

Notes: - A = $(\pi D^2)/4$; where D is converted to m.

- V = Q/A; where Q is converted to m³/s.

- $h_f = L \times \left(\frac{Q}{0.278 \times C \times D^{2.63}} \right)^{1/0.54}$; where Q is converted to m³/s.

D - Pipe Diameter

Q - Demand Flow

A - Pipe Flow Area

V - Flow Velocity

C - Pipe Coefficient

L - Pipe Length

PROJECT	796060 Grey Road 19, Blue Mountains	FILE	123143		
		DATE	6-Nov-2025		
SUBJECT	Water Supply Calculations Building C	NAME	JN	CHECK	JA
		PAGE	2	OF	2

STATIC HEAD LOSS

	Road C/L Elev (m)	Depth to W/M (m)	Finished Grade (m)	Depth to W/M (m)	Total Head Loss	
					(m)	(kPa)
Static Head Loss	222.50	1.80	222.80	1.80	0.30	2.95

TOTAL LOSSES - MAXIMUM DAY DEMAND PLUS FIRE FLOW

Service Type	Static Pressure (kPa)	Static Loss (kPa)	W/M Loss (kPa)	Service Loss (kPa)	Total Loss (kPa)	Service Pressure (kPa)
West Branch	350.00	2.95	5.50		8.45	341.55
East Branch South	341.55		18.70		18.70	322.85
East Branch North	350.00	2.95	24.20		27.15	322.85
Fire Prot. Service	322.85			1.70	1.70	321.15

Meets minimum recommended pressure during maximum day plus fire flow (140 kPa).

TOTAL LOSSES - PEAK DAILY FLOW

Service Type	Static Pressure (kPa)	Static Loss (kPa)	W/M Loss (kPa)	Service Loss (kPa)	Total Loss (kPa)	Service Pressure (kPa)
West Branch	275.00	2.95	0.30		3.25	271.75
East Branch South	271.75		0.80		0.80	270.95
East Branch North	275.00	2.95	1.10		4.05	270.95
Domestic Service	270.95			0.50	0.50	270.45

Meets minimum recommended pressure of service at exterior building face (200 kPa).

PROJECT	796060 Grey Road 19, Blue Mountains	FILE	123143		
		DATE	6-Nov-2025		
SUBJECT	Water Supply Calculations Building D	NAME	JN	CHECK	JA
		PAGE	1	OF	2

SITE DESCRIPTION

Residential development consisting of 8 buildings with 45 to 90 units per building for a total of 603 units.

Servicing provided through private watermain and two connections per building:

- one dedicated domestic service; and
- one dedicated fire protection service.

DAILY DEMAND DESIGN PARAMATERS

Pop. Density	2.15	people/unit	Q = PxDxPF, where:
Demand	350	L/person/day	P = Population
Units per Service	90	= 193.5 people	D = Per Cap. Demand
Total Units	827	= 1,778.1 people	PF = Peaking Factor
Fire Flow	133	L/s	

Design Demand	Per Service		Total	
	L/day	L/s	L/day	L/s
Average Daily	67,725	0.78	622,335	7.20
Max Day Factors	4.60		2.60	
Maximum Day	311,535	3.61	1,618,071	18.73
Peak Hour Factors	6.90		3.90	
Peak Hour	467,303	5.41	2,427,107	28.09

WATERMAIN SERVICE SIZING AND FRICTION LOSS

					Maximum Day Demand + Fire Flow				Peak Hour Demand				Comb. Service
Service Type	D (mm)	C	L (m)	A (m ²)	Q (L/s)	V (m/s)	Friction Loss		Q (L/s)	V (m/s)	Friction Loss		
							(m)	kPa			(m)	kPa	
Domestic Service	75	100	20.0	0.0045	3.61	0.81	0.39	3.9	5.41	1.21	0.81	8.0	
Fire Prot. Service	200	110	20.0	0.0315	133.00	4.23	2.15	21.1					No
West Branch	250	110	282.0	0.0491	28.59	0.59	0.60	5.9	5.12	0.11	0.03	0.3	
East Branch South	200	110	320.0	0.0315	28.59	0.91	2.00	19.7	5.12	0.17	0.09	0.9	
East Branch North	200	110	28.0	0.0315	123.14	3.91	2.61	25.6	22.97	0.73	0.12	1.2	

Notes: - A = $(\pi D^2)/4$; where D is converted to m.

- V = Q/A; where Q is converted to m³/s.

- $h_f = L \times \left(\frac{Q}{0.278 \times C \times D^{2.63}} \right)^{1/0.54}$; where Q is converted to m³/s.

D - Pipe Diameter

Q - Demand Flow

A - Pipe Flow Area

V - Flow Velocity

C - Pipe Coefficient

L - Pipe Length

PROJECT	796060 Grey Road 19, Blue Mountains	FILE	123143	
		DATE	6-Nov-2025	
SUBJECT	Water Supply Calculations Building D	NAME	JN	CHECK JA
		PAGE	2	OF 2

STATIC HEAD LOSS

	Road C/L Elev (m)	Depth to W/M (m)	Finished Grade (m)	Depth to W/M (m)	Total Head Loss	
					(m)	(kPa)
Static Head Loss	222.50	1.80	222.80	1.80	0.30	2.95

TOTAL LOSSES - MAXIMUM DAY DEMAND PLUS FIRE FLOW

Service Type	Static Pressure (kPa)	Static Loss (kPa)	W/M Loss (kPa)	Service Loss (kPa)	Total Loss (kPa)	Service Pressure (kPa)
West Branch	350.00	2.95	5.90		8.85	341.15
East Branch South	341.15		19.70		19.70	321.45
East Branch North	350.00	2.95	25.60		28.55	321.45
Fire Prot. Service	321.45			21.10	21.10	300.35

Meets minimum recommended pressure during maximum day plus fire flow (140 kPa).

TOTAL LOSSES - PEAK DAILY FLOW

Service Type	Static Pressure (kPa)	Static Loss (kPa)	W/M Loss (kPa)	Service Loss (kPa)	Total Loss (kPa)	Service Pressure (kPa)
West Branch	275.00	2.95	0.30		3.25	271.75
East Branch South	271.75		0.90		0.90	270.85
East Branch North	275.00	2.95	1.20		4.15	270.85
Domestic Service	270.85			8.00	8.00	262.85

Meets minimum recommended pressure of service at exterior building face (200 kPa).

PROJECT	796060 Grey Road 19, Blue Mountains	FILE	123143		
		DATE	6-Nov-2025		
SUBJECT	Water Supply Calculations Building E	NAME	JN	CHECK	JA
		PAGE	1	OF	2

SITE DESCRIPTION

Residential development consisting of 8 buildings with 45 to 90 units per building for a total of 603 units.

Servicing provided through private watermain and two connections per building:

- one dedicated domestic service; and
- one dedicated fire protection service.

DAILY DEMAND DESIGN PARAMATERS

Pop. Density	2.15	people/unit	Q = PxDxPF, where:
Demand	350	L/person/day	P = Population
Units per Service	90	= 193.5 people	D = Per Cap. Demand
Total Units	827	= 1,778.1 people	PF = Peaking Factor
Fire Flow	117	L/s	

Design Demand	Per Service		Total	
	L/day	L/s	L/day	L/s
Average Daily	67,725	0.78	622,335	7.20
Max Day Factors	4.60		2.60	
Maximum Day	311,535	3.61	1,618,071	18.73
Peak Hour Factors	6.90		3.90	
Peak Hour	467,303	5.41	2,427,107	28.09

WATERMAIN SERVICE SIZING AND FRICTION LOSS

					Maximum Day Demand + Fire Flow				Peak Hour Demand				Comb. Service
Service Type	D (mm)	C	L (m)	A (m ²)	Q (L/s)	V (m/s)	Friction Loss		Q (L/s)	V (m/s)	Friction Loss		
							(m)	kPa			(m)	kPa	
Domestic Service	75	100	18.0	0.0045	3.61	0.81	0.35	3.5	5.41	1.21	0.73	7.2	
Fire Prot. Service	200	110	18.0	0.0315	117.00	3.72	1.53	15.1					No
West Branch	250	110	282.0	0.0491	67.26	1.37	2.89	28.4	13.88	0.29	0.16	1.6	
East Branch South	200	110	130.0	0.0315	67.26	2.14	3.95	38.8	13.88	0.45	0.22	2.2	
East Branch North	200	110	218.0	0.0315	68.47	2.18	6.85	67.2	14.21	0.46	0.38	3.8	

Notes: - A = $(\pi D^2)/4$; where D is converted to m.

- V = Q/A; where Q is converted to m³/s.

- $h_f = L \times \left(\frac{Q}{0.278 \times C \times D^{2.63}} \right)^{1/0.54}$; where Q is converted to m³/s.

D - Pipe Diameter

Q - Demand Flow

A - Pipe Flow Area

V - Flow Velocity

C - Pipe Coefficient

L - Pipe Length

PROJECT	796060 Grey Road 19, Blue Mountains	FILE	123143	
		DATE	6-Nov-2025	
SUBJECT	Water Supply Calculations Building E	NAME	JN	CHECK JA
		PAGE	2	OF 2

STATIC HEAD LOSS

	Road C/L Elev (m)	Depth to W/M (m)	Finished Grade (m)	Depth to W/M (m)	Total Head Loss	
					(m)	(kPa)
Static Head Loss	222.50	1.80	222.80	1.80	0.30	2.95

TOTAL LOSSES - MAXIMUM DAY DEMAND PLUS FIRE FLOW

Service Type	Static Pressure (kPa)	Static Loss (kPa)	W/M Loss (kPa)	Service Loss (kPa)	Total Loss (kPa)	Service Pressure (kPa)
West Branch	350.00	2.95	28.40		31.35	318.65
East Branch South	318.65		38.80		38.80	279.85
East Branch North	350.00	2.95	67.20		70.15	279.85
Fire Prot. Service	279.85			15.10	15.10	264.75

Meets minimum recommended pressure during maximum day plus fire flow (140 kPa).

TOTAL LOSSES - PEAK DAILY FLOW

Service Type	Static Pressure (kPa)	Static Loss (kPa)	W/M Loss (kPa)	Service Loss (kPa)	Total Loss (kPa)	Service Pressure (kPa)
West Branch	275.00	2.95	1.60		4.55	270.45
East Branch South	270.45		2.20		2.20	268.25
East Branch North	275.00	2.95	3.80		6.75	268.25
Domestic Service	268.25			7.20	7.20	261.05

Meets minimum recommended pressure of service at exterior building face (200 kPa).

PROJECT	796060 Grey Road 19, Blue Mountains	FILE	123143
		DATE	6-Nov-2025
SUBJECT	Water Supply Calculations Building F	NAME	JN
		CHECK	JA
		PAGE	1
		OF	2

SITE DESCRIPTION

Residential development consisting of 8 buildings with 45 to 90 units per building for a total of 603 units.

Servicing provided through private watermain and two connections per building:

- one dedicated domestic service; and
- one dedicated fire protection service.

DAILY DEMAND DESIGN PARAMATERS

Pop. Density	2.15	people/unit	Q = Px Dx PF, where:
Demand	350	L/person/day	P = Population
Units per Service	90	= 193.5 people	D = Per Cap. Demand
Total Units	827	= 1,778.1 people	PF = Peaking Factor
Fire Flow	133	L/s	

Design Demand	Per Service		Total	
	L/day	L/s	L/day	L/s
Average Daily	67,725	0.78	622,335	7.20
Max Day Factors	4.60		2.60	
Maximum Day	311,535	3.61	1,618,071	18.73
Peak Hour Factors	6.90		3.90	
Peak Hour	467,303	5.41	2,427,107	28.09

WATERMAIN SERVICE SIZING AND FRICTION LOSS

					Maximum Day Demand + Fire Flow				Peak Hour Demand				Comb. Service
Service Type	D (mm)	C	L (m)	A (m ²)	Q (L/s)	V (m/s)	Friction Loss		Q (L/s)	V (m/s)	Friction Loss		
							(m)	kPa			(m)	kPa	
Domestic Service	75	100	20.0	0.0045	3.61	0.81	0.39	3.9	5.41	1.21	0.81	8.0	
Fire Prot. Service	200	110	20.0	0.0315	133.00	4.23	2.15	21.1					No
West Branch	250	110	282.0	0.0491	72.21	1.48	3.30	32.4	13.28	0.28	0.15	1.5	
East Branch South	200	110	146.0	0.0315	72.21	2.30	5.06	49.7	13.28	0.43	0.23	2.3	
East Branch North	200	110	202.0	0.0315	79.52	2.53	8.37	82.1	14.81	0.48	0.38	3.8	

Notes: - A = $(\pi D^2)/4$; where D is converted to m.

- V = Q/A; where Q is converted to m³/s.

- $h_f = L \times \left(\frac{Q}{0.278 \times C \times D^{2.63}} \right)^{1/0.54}$; where Q is converted to m³/s.

D - Pipe Diameter

Q - Demand Flow

A - Pipe Flow Area

V - Flow Velocity

C - Pipe Coefficient

L - Pipe Length

PROJECT	796060 Grey Road 19, Blue Mountains	FILE	123143	
		DATE	6-Nov-2025	
SUBJECT	Water Supply Calculations Building F	NAME	JN	CHECK JA
		PAGE	2	OF 2

STATIC HEAD LOSS

	Road C/L Elev (m)	Depth to W/M (m)	Finished Grade (m)	Depth to W/M (m)	Total Head Loss	
					(m)	(kPa)
Static Head Loss	222.50	1.80	222.80	1.80	0.30	2.95

TOTAL LOSSES - MAXIMUM DAY DEMAND PLUS FIRE FLOW

Service Type	Static Pressure (kPa)	Static Loss (kPa)	W/M Loss (kPa)	Service Loss (kPa)	Total Loss (kPa)	Service Pressure (kPa)
West Branch	350.00	2.95	32.40		35.35	314.65
East Branch South	314.65		49.70		49.70	264.95
East Branch North	350.00	2.95	82.10		85.05	264.95
Fire Prot. Service	264.95			21.10	21.10	243.85

Meets minimum recommended pressure during maximum day plus fire flow (140 kPa).

TOTAL LOSSES - PEAK DAILY FLOW

Service Type	Static Pressure (kPa)	Static Loss (kPa)	W/M Loss (kPa)	Service Loss (kPa)	Total Loss (kPa)	Service Pressure (kPa)
West Branch	275.00	2.95	1.50		4.45	270.55
East Branch South	270.55		2.30		2.30	268.25
East Branch North	275.00	2.95	3.80		6.75	268.25
Domestic Service	268.25			8.00	8.00	260.25

Meets minimum recommended pressure of service at exterior building face (200 kPa).

PROJECT	796060 Grey Road 19, Blue Mountains	FILE	123143		
		DATE	6-Nov-2025		
SUBJECT	Water Supply Calculations Building G	NAME	JN	CHECK	JA
		PAGE	1	OF	2

SITE DESCRIPTION

Residential development consisting of 8 buildings with 45 to 90 units per building for a total of 603 units.

Servicing provided through private watermain and two connections per building:

- one dedicated domestic service; and
- one dedicated fire protection service.

DAILY DEMAND DESIGN PARAMATERS

Pop. Density	2.15	people/unit	Q = Px Dx PF, where:
Demand	350	L/person/day	P = Population
Units per Service	90	= 193.5 people	D = Per Cap. Demand
Total Units	827	= 1,778.1 people	PF = Peaking Factor
Fire Flow	150	L/s	

Design Demand	Per Service		Total	
	L/day	L/s	L/day	L/s
Average Daily	67,725	0.78	622,335	7.20
Max Day Factors	4.60		2.60	
Maximum Day	311,535	3.61	1,618,071	18.73
Peak Hour Factors	6.90		3.90	
Peak Hour	467,303	5.41	2,427,107	28.09

WATERMAIN SERVICE SIZING AND FRICTION LOSS

					Maximum Day Demand + Fire Flow				Peak Hour Demand				Comb. Service
Service Type	D (mm)	C	L (m)	A (m ²)	Q (L/s)	V (m/s)	Friction Loss		Q (L/s)	V (m/s)	Friction Loss		
							(m)	kPa			(m)	kPa	
Domestic Service	75	100	20.0	0.0045	3.61	0.81	0.39	3.9	5.41	1.21	0.81	8.0	
Fire Prot. Service	200	110	20.0	0.0315	150.00	4.77	2.69	26.4					No
West Branch	250	110	282.0	0.0491	87.33	1.78	4.69	46.0	14.55	0.30	0.17	1.7	
East Branch South	200	110	112.0	0.0315	87.33	2.78	5.52	54.2	14.55	0.47	0.20	2.0	
East Branch North	200	110	236.0	0.0315	81.39	2.59	10.21	100.2	13.55	0.44	0.37	3.7	

Notes: - A = $(\pi D^2)/4$; where D is converted to m.

- V = Q/A; where Q is converted to m³/s.

- $h_f = L \times \left(\frac{Q}{0.278 \times C \times D^{2.63}} \right)^{1/0.54}$; where Q is converted to m³/s.

D - Pipe Diameter

Q - Demand Flow

A - Pipe Flow Area

V - Flow Velocity

C - Pipe Coefficient

L - Pipe Length

PROJECT	796060 Grey Road 19, Blue Mountains	FILE	123143	
		DATE	6-Nov-2025	
SUBJECT	Water Supply Calculations Building G	NAME	JN	CHECK JA
		PAGE	2	OF 2

STATIC HEAD LOSS

	Road C/L Elev (m)	Depth to W/M (m)	Finished Grade (m)	Depth to W/M (m)	Total Head Loss	
					(m)	(kPa)
Static Head Loss	222.50	1.80	222.80	1.80	0.30	2.95

TOTAL LOSSES - MAXIMUM DAY DEMAND PLUS FIRE FLOW

Service Type	Static Pressure (kPa)	Static Loss (kPa)	W/M Loss (kPa)	Service Loss (kPa)	Total Loss (kPa)	Service Pressure (kPa)
West Branch	350.00	2.95	46.00		48.95	301.05
East Branch South	301.05		54.20		54.20	246.85
East Branch North	350.00	2.95	100.20		103.15	246.85
Fire Prot. Service	246.85			26.40	26.40	220.45

Meets minimum recommended pressure during maximum day plus fire flow (140 kPa).

TOTAL LOSSES - PEAK DAILY FLOW

Service Type	Static Pressure (kPa)	Static Loss (kPa)	W/M Loss (kPa)	Service Loss (kPa)	Total Loss (kPa)	Service Pressure (kPa)
West Branch	275.00	2.95	1.70		4.65	270.35
East Branch South	270.35		2.00		2.00	268.35
East Branch North	275.00	2.95	3.70		6.65	268.35
Domestic Service	268.35			8.00	8.00	260.35

Meets minimum recommended pressure of service at exterior building face (200 kPa).

PROJECT	796060 Grey Road 19, Blue Mountains	FILE	123143		
		DATE	6-Nov-2025		
SUBJECT	Water Supply Calculations Building H	NAME	JN	CHECK	JA
		PAGE	1	OF	2

SITE DESCRIPTION

Residential development consisting of 8 buildings with 45 to 90 units per building for a total of 603 units.

Servicing provided through private watermain and two connections per building:

- one dedicated domestic service; and
- one dedicated fire protection service.

DAILY DEMAND DESIGN PARAMATERS

Pop. Density	2.15	people/unit	Q = PxDxPF, where:
Demand	350	L/person/day	P = Population
Units per Service	90	= 193.5 people	D = Per Cap. Demand
Total Units	827	= 1,778.1 people	PF = Peaking Factor
Fire Flow	150	L/s	

Design Demand	Per Service		Total	
	L/day	L/s	L/day	L/s
Average Daily	67,725	0.78	622,335	7.20
Max Day Factors	4.60		2.60	
Maximum Day	311,535	3.61	1,618,071	18.73
Peak Hour Factors	6.90		3.90	
Peak Hour	467,303	5.41	2,427,107	28.09

WATERMAIN SERVICE SIZING AND FRICTION LOSS

					Maximum Day Demand + Fire Flow				Peak Hour Demand				Comb. Service
Service Type	D (mm)	C	L (m)	A (m ²)	Q (L/s)	V (m/s)	Friction Loss		Q (L/s)	V (m/s)	Friction Loss		
							(m)	kPa			(m)	kPa	
Domestic Service	75	100	20.0	0.0045	3.61	0.81	0.39	3.9	5.41	1.21	0.81	8.0	
Fire Prot. Service	200	110	20.0	0.0315	150.00	4.77	2.69	26.4					No
West Branch	250	110	282.0	0.0491	95.27	1.95	5.51	54.1	15.87	0.33	0.20	2.0	
East Branch South	200	110	74.0	0.0315	95.27	3.03	4.29	42.1	15.87	0.51	0.16	1.6	
East Branch North	200	110	274.0	0.0315	73.46	2.34	9.81	96.2	12.23	0.39	0.36	3.6	

Notes: - A = $(\pi D^2)/4$; where D is converted to m.

- V = Q/A; where Q is converted to m³/s.

- $h_f = L \times \left(\frac{Q}{0.278 \times C \times D^{2.63}} \right)^{1/0.54}$; where Q is converted to m³/s.

D - Pipe Diameter

Q - Demand Flow

A - Pipe Flow Area

V - Flow Velocity

C - Pipe Coefficient

L - Pipe Length

PROJECT	796060 Grey Road 19, Blue Mountains	FILE	123143	
		DATE	6-Nov-2025	
SUBJECT	Water Supply Calculations Building H	NAME	JN	CHECK JA
		PAGE	2	OF 2

STATIC HEAD LOSS

	Road C/L Elev (m)	Depth to W/M (m)	Finished Grade (m)	Depth to W/M (m)	Total Head Loss	
					(m)	(kPa)
Static Head Loss	222.50	1.80	222.80	1.80	0.30	2.95

TOTAL LOSSES - MAXIMUM DAY DEMAND PLUS FIRE FLOW

Service Type	Static Pressure (kPa)	Static Loss (kPa)	W/M Loss (kPa)	Service Loss (kPa)	Total Loss (kPa)	Service Pressure (kPa)
West Branch	350.00	2.95	54.10		57.05	292.95
East Branch South	292.95		42.10		42.10	250.85
East Branch North	350.00	2.95	96.20		99.15	250.85
Fire Prot. Service	250.85			26.40	26.40	224.45

Meets minimum recommended pressure during maximum day plus fire flow (140 kPa).

TOTAL LOSSES - PEAK DAILY FLOW

Service Type	Static Pressure (kPa)	Static Loss (kPa)	W/M Loss (kPa)	Service Loss (kPa)	Total Loss (kPa)	Service Pressure (kPa)
West Branch	275.00	2.95	2.00		4.95	270.05
East Branch South	270.05		1.60		1.60	268.45
East Branch North	275.00	2.95	3.60		6.55	268.45
Domestic Service	268.45			8.00	8.00	260.45

Meets minimum recommended pressure of service at exterior building face (200 kPa).