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372 Grey Road 21 West

PRELIMINARY FUNCTIONAL SERVICING REPORT

Rhemm Properties Inc.

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Issue	Date	Description
1	March, 2022	Draft Plan of Subdivision Application
2	November 6, 2023	Draft Report for Client Review
3	January 22, 2024	Draft Plan of Subdivision Application
4	September 6, 2024	Draft Plan of Subdivision Application
5	July 23, 2025	Draft Plan of Subdivision Application

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1 Introduction

Tatham Engineering has been retained by Rhemm Properties Inc. to prepare a Preliminary Functional Servicing Report to support a Draft Plan of Subdivision (attached) for a residential development located at 372 Grey Road 21 West, Town of The Blue Mountains. The lands are split into two distinct parcels by the Georgian Trail. The subject site is shown in the attached Figure 1: Location Plan. This report specifically addresses the servicing requirements for the development of the west parcel.

1.1 OBJECTIVE

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

1.2 SUPPORTING REPORTS

Additional reports have been prepared in conjunction with this report in support of the proposed residential development, including:

- *A Geotechnical Investigation for Proposed Residential Development 372 Grey Road 21 West* prepared by Soil Engineers Ltd. (September 2022);
- *372 Grey Road 21 Development Stormwater Management Report* prepared by Tatham Engineering (July, 2025);
- *372 Grey Road 21 Development Traffic Impact Brief* prepared by Tatham Engineering (July, 2025);
- 372 Grey Road 21, Town of The Blue Mountains, Flood Assessment Brief – West Parcel, prepared by Tatham Engineering. (July 2025); and
- Grey County Road 21 Trunk Sanitary Sewer Technical Summary, prepared by C.C. Tatham & Associates Ltd. (March 13, 2012).

2 Development Site

2.1 SITE LOCATION & DESCRIPTION

The site is legally described as Part of Lot 149 Registered Plan 529 in the Town of the Blue Mountains and is split into a west and east parcel by the Georgian Trail. The proposed development is limited to the west parcel. The west parcel is bounded by the Georgian Trail to the northwest, the future Eden Oaks Development to the west, and undeveloped lands to the south and southwest. The subject property is currently zoned Development (D) with some Hazard adjacent (H-1) area. An existing channel travels along the eastern edge of the site and is regulated by the Grey Sauble Conservation Authority (GSCA). Refer to Figure 1: Location Plan for additional details.

2.2 SURFACE CONDITIONS

A topographic survey of the subject property was completed by Tatham Engineering on November 3, 2021. The high spot (187.56 m) is located in the southwest corner of the site. The subject property generally slopes from the southwest to the northeast at an average gradient of 2.5%, draining to an existing watercourse along the Georgian Trail. The watercourse flows northwest, crosses under the Georgian Trail and eventually outlets to Georgian Bay. Refer to the Pre-Development Drainage Plan (DP01) for details on existing drainage areas.

The 7.0 ha site is currently undeveloped, vacant and is primarily covered with trees.

2.3 SUBSURFACE CONDITIONS

A geotechnical investigation (dated September 2022) completed by Soil Engineers Ltd. was submitted under separate cover. Fieldwork was conducted on April 18, 2022 and consisted of seven boreholes. The boreholes advanced to depths 0.6 m to 3.4 m below existing ground surface (BGS). In general, subsurface conditions consists of a surficial layer of topsoil, underlain by a sand and gravel deposit, overlying a probable bedrock depth of 0.6 to 3.4 m.

The boreholes were checked for groundwater upon completion of drilling. Groundwater was recorded at depths ranging from 0.4 to 2.4 m.

Key recommendations from the geotechnical report include:

- The topsoil and trees must be removed for site development. The topsoil can be reused for landscaping in designated areas only. Any surplus should be removed offsite.
- Where site grading with additional fill is required, it is economical to place an engineered fill to regrade the site for development.

- The houses can be constructed on conventional spread and strip footing founded on engineered fill, native sand and gravel or bedrock. To prevent the abrupt settlement and wall cracks on the structure, the footings of each individual house should either be founded on bedrock or on soil stratum.
- It is recommended the slab-on-grade or basement floor of new structures must be at least 1.0 m above the highest groundwater level unless the submerged portion is waterproofed and designed to resist the hydrostatic pressure.
- Any excavation into the bedrock will require considerable effort by the use of pneumatic hammering or controlled blasting.
- Where excavation extend below the groundwater level, dewatering with closely spaced sumps will be required.
- If imported fill is to be used, it should be inorganic soils, free of deleterious or any material with environmental issue (contamination). Any potential imported earth fill from off site must be reviewed for geotechnical and environmental quality by the appropriate personnel as authorized by the developer or agency, before it is hauled to the site.

The soil has been classified as Granby sand loam (Type B), as per the *Soil Survey of Grey County - Report No. 17 of the Ontario Soil Survey*, completed by the Ontario Department of Agriculture. This soil group consists of very deep, poorly drained, or very poorly drained sandy soils.

2.4 PROPOSED DEVELOPMENT

The proposed development includes 47 single family detached homes and 6 semi-detached homes. 23 of the single detached homes (Lots 53-31) will be constructed so there is a separate access to the basement and the future owners can choose to rent the basements of the homes as Accessory Dwelling Units (ADUs). Road access to the site will be provided by the future Eden Oaks development to the west of the site. The single detached units and semi-detached units will have a minimum lot frontage of 12 m and 9 m, respectively, as well as varying depths around 30 m. The proposed development is shown on the Development Concept (SP01).

3 Water Supply and Distribution

3.1 EXISTING INFRASTRUCTURE

An existing 200 mm diameter regional watermain runs along an easement from Monterra Road and through the proposed development site, crosses under the Georgian Trail and continue to Timmons Street.

The proposed development is in Pressure Zone 1 East of the Town of The Blue Mountains (TOBM) water distribution system. Water is supplied by the Thornbury Water Treatment Plant (WTP) The closest water storage tank is the Happy Valley Road reservoir.

3.2 PROPOSED INFRASTRUCTURE

The development site will be serviced by connecting to the municipal water distribution system.

The development's internal water distribution system will connect to the existing 200 mm diameter watermain on the project site. The proposed lot layout requires re-routing of the existing watermain while still maintaining the watermain entry and exit points from the site. The development will include the installation of 200 mm diameter watermain within the internal roads. A 200 mm diameter watermain stub will be provided at the west limit of the site, for future connection to the proposed Trailshead development.

The proposed single detached homes and semi-detached homes will be serviced by 25 mm diameter service connections. Each home will be equipped with a water meter and backflow prevention device installed inside the home, in accordance with the Ontario Building Code and the Town's water by-law.

Refer to the General Site Servicing Plan (Drawing SS01) for the proposed water system concept.

3.3 WATER DEMANDS ASSESSMENT

3.3.1 Water Supply Demands

Water supply demands for the proposed development have been calculated based on the Town of The Blue Mountains engineering standards (May 2023) and the MECP Design Guidelines for Drinking-Water Systems, Table 3-3, (2008), as shown in Table 1. For the accessory dwelling units, a design population of 1 person/ADU was assumed. The 23 proposed accessory dwelling units have been considered to be equivalent to 11 residential units as shown below, giving the proposed development a total equivalent of 64 residential units.

Equivalent Units = (23 ADUs x 1 person/per ADU)/2.15 persons/unit

= 10.70 units ≈ 11 units

Table 1: Water Supply Design Criteria

	DESIGN CRITERIA
Residential Population	2.15 persons/unit (TOBM) 1 person/ADU (Assumed Value)
Average water consumption per person	350 L/person/day (TOBM)
Maximum Day Factor	5.4 (MECP for population of 137)
Peak Hour Factor	8.1 (MECP for population of 137)

The water demand for 53 residential units and 23 Accessory Dwelling Units is calculated as follows:

Design Population (P) = 2.15 persons/unit x 53 units + 1 person/ADU x 23 ADUs

= 137 persons

Average Day Demand (ADD) = 137 persons x 350 L/person/day

= 47,950 L/day

= 47.95 m^3/day (0.55 L/s)

Maximum Day Demand (MDD) = ADD x Maximum Day Factor

= 47.95 m^3/day x 5.4

= 258.9 m^3/day (3.00 L/s)

Peak Hour Demand (PHD) = ADD x Peak Hour Factor

= 47.95 m^3/day x 6.8

= 388.4 m^3/day (4.50 L/s)

3.3.2 Fire Flow Requirements

Town engineering standards require fire flows based on the *Fire Underwriter's Survey Guidelines* (FUS, 2020) to be available; however, if not achievable to be reviewed with the Town. The Town's previous engineering standards (2009) permitted interim fire flows based on OBC requirements,

where there was evidence acceptable to the Town, FUS fire flows will be available within five years.

Fire flow requirements for the single detached homes and semi-detached homes were calculated based on FUS and the Ontario Fire Marshal's Fire Protection Water Supply Guideline for Part 3 of the Ontario Building Code (OFM 1999), and based on the following preliminary building design parameters:

- Ordinary construction framing material with masonry or brick exterior and asphalt shingle roofing;
- No sprinklers; and
- Minimum yard sizes and road widths as shown on the Development Concept Plan SP01 drawing dated July 2025.

The maximum floor area of less than 350 m^2 (not including basement) was used in the calculation for the 2-storey single detached homes in the FUS calculations. The maximum floor area of less than 460 m^2 (not including basement) was used in the calculation for the 2-storey semi-detached homes in the FUS calculations. Calculations completed in accordance with OFM for both types of dwellings include the basement.

The FUS and OFM fire flow calculations are based on Lot 3 for single detached homes and Lots 23 and 24 for semi-detached homes, respectively. Both lots represent typical single detached and semi-detached lots and are considered worst cases in terms of calculating the FUS exposure charge. The calculated fire flow requirements are considered conservative and will be updated when detailed building designs and dimensions are available.

Calculations for the FUS and OFM fire flow requirements are included in Appendix A and summarized in Table 2.

Table 2: Summary of Required Fire Flow

METHODOLOGY	SINGLE DETACHED		SEMI-DETACHED	
	Required Fire Flow (L/s)	MDD + FF (L/s)	Required Fire Flow (L/s)	MDD + FF (L/s)
FUS	100.0	103.0	117.0	120.0
OBC/OFM	45.0	48.0	60.0	63.0

3.4 WATER SUPPLY CAPACITY

The Town of The Blue Mountains Water Treatment Plant has a water supply capacity of 16,390 m^3/day (including the 1,250 m^3/day received from the Town of Collingwood), as per *The Town of The Blue Mountains 2024 Year End Water and Wastewater Capacity Assessment*. The report indicates 2,896 m^3/day (2,902 units) is available.

This available capacity exceeds the calculated MDD 215.8 m^3/day for the proposed development's 53 homes and 23 ADUs.

3.5 WATER PRESSURES AND FLOWS

Acceptable pressure ranges for each demand scenario, based on the Town design standards, are presented in Table 3.

Table 3: Pressure Design Criteria

DEMAND SCENARIO	ACCEPTABLE PRESSURE RANGE	
	kPa	psi
Average and Maximum Day	350 – 550	50 – 80
Minimum and Peak Hour	275 – 700	40 – 100
Maximum Day plus Fire Flow	140 – 700	20 – 100

Hydraulic boundary conditions from the Town's water model are presented in Tables 4 and 5 for the two following options for connecting to the municipal distribution system, along with estimated pressures for the development calculated based on lot elevation.

- Option 1 assumes two connections to the existing municipal watermains (north and east of the site), and no connection to the future Trailshead development to the west.
- Option 2 assumes two connections to the existing municipal watermains (north and east of the site) as for Option 1, plus a third connection to the future Trailshead development's water distribution system.

Model boundary conditions were provided by the Town for the range of anticipated demand scenarios, including MDD plus fire flows.

Pressures for the development have been calculated for the lowest and highest lot elevations on the site. Lot elevations are estimated to range from approximately 182.50 m to 187.00 m. The hydraulic calculations and a copy of the model boundary conditions provided by the Town are included in Appendix A.

Estimated pressures within the development are generally within the acceptable range for all demand scenarios, with or without the connection to Trailshead. Pressures under ADD (580 kPa to 583 kPa) are slightly higher than the preferred maximum (550 kPa) at the lowest elevation. Individual pressure reducing valves will be considered for lot elevations of less than 186 m.

Without the connection to Trailshead, the available MDD plus fire flow within the development (103.3 L/s) is essentially equal to the minimum required by FUS (103.0 L/s) for the single detached units but less than the 120 L/s required for the semi-detached units. The available MDD plus fire flow is greater than the minimum required by OBC for both the single (48.0 L/s) and semi-detached units (63.0 L/s). With the connection to Trailshead, the available MDD plus fire flow (135 L/s) is greater than the minimum required by both FUS and OBC.

Table 4: Estimated Pressures for Option 1 - No Future Connection to Trailshead Development

DEMAND SCENARIO	MODEL BOUNDARY CONDITIONS				CALCULATED PRESSURES (kPa)	
	CONNECTION 1 (ELEV. 183 m)		CONNECTION 2 (ELEV. 184.27 m)			
	PRESSURE (kPa)	HGL (m)	PRESSURE (kPa)	HGL (m)	LOW ELEV. (182.50 m)	HIGH ELEV. (187.00 m)
ADD	575	241.74	562	241.74	580	536
PHD	493	233.35	481	233.43	499	454
MDD + AFF (102 L/s)	177	201.08	165	201.09	182	138

Table 5: Estimated Pressures for Option 2 - Future Connection to Trailshead Development

DEMAND SCENARIO	MODEL BOUNDARY CONDITIONS						CALCULATED PRESSURES (kPa)	
	CONNECTION 1 (ELEV. 183 m)		CONNECTION 2 (ELEV. 184.27 m)		CONNECTION 3 (ELEV. 183.50 m)			
	PRESSURE (kPa)	HGL (m)	PRESSURE (kPa)	HGL (m)	PRESSURE (kPa)	HGL (m)	LOW ELEV. (182.50 m)	HIGH ELEV. (187.00 m)
ADD	577	241.97	565	241.97	572	241.97	583	539
PHD	489	233.01	478	233.10	484	233.00	496	451
MDD + AFF (133.7 L/s)	269	210.51	251	209.89	264	210.45	268	230
MDD + AFF (105 L/s)	362	220.01	346	219.63	357	219.98	364	323

4 Sanitary Servicing

4.1 EXISTING INFRASTRUCTURE

Sanitary Sewer

An existing 675 mm diameter regional sanitary sewer runs along an easement from Monterra Road, through the proposed development site, crosses under the Georgian Trail and continues to Timmons Street. On Timmons Street a 300 mm diameter sanitary sewer connects with the 675 mm diameter sewer and drains east on Highway 26 to the Craigleith Main Wastewater Pumping Station (WWPS). The Craigleith Main WWPS pumps sanitary flows west via force main to the Craigleith Wastewater Treatment Plant (WWTP).

Craigleith Main Wastewater Pumping Station & Highway 26 Force Main

The Craigleith Main Wastewater Pumping Station pumps wastewater to the Craigleith Sewage Treatment Plant via 2 - 300 mm diameter force mains crossing to the north side of Highway 26, then east approximately 1.5 km to Long Point Road, then north approximately 450 m to the Craigleith Sewage Treatment Plant.

The Craigleith Main WWPS has an installed capacity of 25,920 m^3/day and firm capacity of 12,960 m^3/day. The WWPS has 8,586 residential units allocated or reserved to be serviced. The Craigleith Main WWPS is over allocated by 1,936 units with the largest pumping unit out of service (firm capacity). With both pumps in service, the built capacity is able to accommodate 13,299 units, with a surplus capacity of 4,713 units. The Town commenced with the engineering design for upgrades to the WWPS in 2023, with construction anticipated to start in 2025.

In 2012, a trunk sanitary sewer was planned along Grey Road 21 (Osler Bluff Road) to collect and convey wastewater from existing and proposed development lands located within the Town of The Blue Mountains adjacent to and upstream of Grey Road 21 (Osler Bluff Road). The sewer was planned to be extended from Highway 26 south for approximately 6.5 km to the Osler Bluff Ski Club then west approximately 3.0 kms to the proposed Castle Glen development on Grey Road 19 and accommodate a total of 4,622 residential units having a contributing drainage area of approximately 1,094 hectares.

Design and construction of the 450 mm diameter trunk sewer was completed in 2012 extending from Highway 26 approximately 2.5 km. At its downstream end, the sewer was connected to an existing 300 mm diameter sanitary sewer located on the south side of Highway 26 (as an interim measure). In the future, the trunk sewer will be extended across Highway 26 and run north directly to a new lift station at the Craigleith Sewage Treatment Plant. After completion of the

Grey Road 21 trunk sewer the Craigleith Main WWPS will no longer receive runoff from sanitary sewers draining to Grey Road 21. This will relieve capacity issues at the Craigleith Main WWPS.

The Craigleith Wastewater Treatment Plant (WWTP) the plant has a firm-built capacity of 8,133 m^3/day. The report indicates 2,810 m^3/day (4,532 units) is available.

4.2 PROPOSED INFRASTRUCTURE

The proposed development lot layout will require the reconfiguration of the regional sanitary sewer while maintaining the same entry and exit point to the site. The sanitary sewers on site will connect to the regional sanitary sewer. Sanitary discharge from the proposed units fronting the internal road will drain to the 675 mm regional sanitary via approximately 550 m of 200 mm diameter PVC sanitary sewer. An additional maintenance structure will be required to tie into the existing sanitary sewer. The connection point to the trunk sewer was investigated and it was confirmed the existing sanitary sewer is at sufficient depth to provide sanitary services to the proposed units. The existing regional sanitary sewer passes through the proposed Lots 42 to 51. The regional sanitary sewer is to be rerouted by removing approximately 175 m of sanitary sewer and an existing maintenance hole and installing 186 m of new sewer.

The proposed sanitary sewer system is shown on the General Site Servicing Plan (SS01).

4.3 SANITARY DEMANDS ASSESSMENT

4.3.1 Sewage Demands

Design Population (P)	= 2.15 persons/unit x 53 units + 1 person/ADU x 23 ADUs
	= 137 persons
Infiltration (I)	= Infiltration Flow x Site Area
	= 0.28 L/ha/s x 3.7 ha
	= 1.04 L/s = 89,510 L/day = 89.5 m^3/day
Average day flow (ADF)	= P x Average daily demand per person + I
	= 137 persons x 350 L/day + 89,510 L/day
	= 47,950 L/day + 89,510 L/day
	= 137,460 L/day
	= 137.5 m^3/day = 1.59 L/s
Harmon's Peaking Factor (M)	= 1 + 14 ÷ (4 + √P/1000)
	= 1 + 14 ÷ (4 + √(137/1000))

= 4.20

Maximum Day Flow = (ADF-I) * M + I

= (137.5 m^3/day – 89.5 m^3/day) x 4.20 + 89.5 m^3/day

= 291.1 m^3/day = 291,100 L/day= 3.37 L/s

4.3.2 Sewage Capacity

As noted above, the Craigleith WWTP has an average day flow capacity of 8,133 m^3/day, with 2,810 m^3/day available. The average day demand of 137.5 m^3/day for the proposed development could be accommodated by the treatment plant (excess capacity is 2,672.5 m^3/day).

We request the Town add the proposed development to their model and confirm the downstream sewer system can accommodate the proposed development.

The Craigleith Main WWPS has the capacity to service an additional 4,713 units with both pumps operational during high flow events. The 23 proposed accessory dwelling units have been considered to be equivalent to 11 residential units as shown below, giving the proposed development a total of 64 residential units.

Equivalent Units = (23 ADUs x 1 person/per ADU)/2.15 persons/unit

= 10.70 units ≈ 11 units

As stated above, the WWPS has capacity to service an additional 4,713 units. The 372 Grey Road West development will require the WWPS to treat an additional 64 units, a small portion of the remaining capacity. Therefore, the Craigleith Main WWPS has capacity to accommodate the 372 Grey Road West development.

5 Grading and Drainage

A Grading Plan (SG01) and Post Development Drainage Plan (DP02) are enclosed and illustrate the proposed drainage conditions of the site and should be referenced when reviewing this section of the report.

Post development drainage will be divided between a 2.80 ha controlled area (Catchment 201) and a 2.80 ha uncontrolled area (Catchment 202). Catchment 201 will include drainage from the proposed road and right of way, front yards and driveways of all lots, rooftops of all lots excluding lots 31 to 53 and backyards of lots 11-17 and 28-30. Catchment 201 will drain west to a stormwater management facility on the Eden Oaks site west of the proposed development. Catchment 202 will consist of drainage from the rooftops and backyards of lots 31 to 53, and the backyards of lots 11-17 and 28-30 and open space land cover and will continue to drain northeast to Watercourse 6 as it did in pre-development.

Under proposed conditions, Catchment 201 will drain internally via a combination of storm sewers and the internal road network to the proposed Regional SWMF within the Eden Oak Development. Onsite storm sewers will be sized to convey the minor, 1:5-year design storm peak flows to the end of pipe SWM facility. The road network will be designed to convey the major storm 1:100-year design storm peak flows to the proposed SWM blocks overland. The design of the internal roadways will limit surface ponding during major storm events to depths of 0.30 m or less providing safe access/egress throughout the proposed development.

6 Stormwater Management

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

- Stormwater management quality control will be provided by a regional stormwater management facility (SWMF) to be located on the proposed Eden Oaks Development immediately northwest of the project site. The SWMF will provide "Enhanced" level 1 water quality control for the effluent from site.
- The Regional SWMF will attenuate post development storm flows, however the facility was not designed to control post development peak storm flows to predevelopment levels so as not to negatively impact flows in the downstream watercourse.
- Minor stormwater flows (1-5 year) will be conveyed to the Regional SWMF via an internal storm sewer network.
- Overland flow routes for larger storm events will follow the internal road towards the stormwater management facility. The maximum ponding depth within the right of way will not exceed 300 mm.
- External drainage will be redirected around the site via false berms along the south and west border of the site and will be conveyed under the road connecting to the Eden Oaks development at the west border via two 600 mm diameter culverts and through the park block via a swale. External drainage flowing along the south and west borders of the site will ultimately end up in Watercourse 6, the same outlet as in the predevelopment condition.
- Construction and maintenance of siltation and erosion control facilities and adherence to strict housekeeping measures during site servicing and building construction will reduce the transportation of sediment from the site, improving stormwater quality and mitigating environmental impacts during construction.

The Stormwater Management Report should be read in conjunction with this report.

7 Transportation

The proposed development is to have an urban cross section, with a 20 m right of way, consistent with the Town's engineering standards.

The site will be accessed from a new road in the proposed Eden Oaks development located at the west border of the site. The new road in the Eden Oaks development will connect to Lakeshore Road East. The proposed development is dependant on the completion of the Eden Oaks development for site access. The road will dead end at the south border allowing for a future connection from a future development south of the site.

Centreline radii have been designed in accordance with the Town Standards. All intersections internal to the site are "Local to Local" type intersection and thus require a minimum curb radius of 10 m. The intersections are in conformance with this minimum curb radius. The minimum allowable horizontal curve radius for a local road with an urban cross section is 100 m, this standard was conformed to at all locations on site. At one location a modified right angle bend was used in a location servicing less than 50 residential units. At this location the bulb was expanded to achieve the minimum lot frontage and a minimum horizontal curb radius of 15 m was used.

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

- Based on the operational analysis, the key intersection of Highway 26 with Lakeshore Road East/Fraser Crescent will provide good operations under existing conditions, and acceptable to poor operations at both the 2030 and 2035 horizons. This is due largely to the significant increase in through volumes along Highway 26 by the 2035 horizon resulting from background growth and new developments in the area. The poor intersection operations are not expected to be problematic, recognizing drivers have alternative options available to avoid delays at the intersection.
- The available through capacity on Highway 26 was also assessed at each horizon. Under existing conditions, Highway 26 operates at or below 72% capacity. By 2035 the road is projected to operate at 105% capacity or greater. While this is not desirable, the intersection operations indicate Highway 26 will continue to provide acceptable operations through the 2035 horizon, thus no action is required.
- A westbound left turn lane on Highway 26 with 30 metres of storage was previously identified as necessary to serve the Trailshead development adjacent to the subject site. Upon review of the relevant MTO warrants, an increase in the storage length to 50 metres is

warranted by the 2035 horizon to serve both the Trailshead development and the subject development. Given the low volume of right turns from Highway 26 to Lakeshore Road, a dedicated eastbound right turn lane is not required.

The Traffic Impact Brief should be read in conjunction with this report.

8 Utilities and External Services

8.1 ELECTRICAL SERVICES

Electrical services fronting the proposed site are available from the proposed Eden Oaks Development and from Timmons Street. Tatham Engineering will be reviewing the proposed development from an electrical servicing standpoint and will confirm if external plant upgrades are required to service the site following submission of an electrical distribution plan.

8.2 GAS SERVICES

Enbridge Gas was contacted about their existing gas mains in the area and their ability to service the proposed development. Confirmation of available capacity will be confirmed prior to proceeding to the detailed design stage.

8.3 TELEPHONE & INTERNET SERVICES

Bell has been contacted regarding available services in the area. Bell has confirmed they have a fibre optic cable buried along the Georgian Trail.

Rogers has been contacted regarding available services in the area.

8.4 CANADA POST

Postal services will be provided by Canada Post. The residents of the proposed development will share a community mailbox the location of which has yet to be determined.

8.5 COLLECTION OF SOLID WASTE AND RECYCLING

The Development is proposed to be added to the Town of the Blue Mountains waste collection system and garbage, recycling and organics is to be picked up from resident's driveways on a regular basis.

9 Summary

As outlined above, existing infrastructure surrounding the subject property can adequately service the development for sanitary sewage, potable water, hydro, natural gas, and telecommunications. Additionally, a Stormwater Management Report submitted under separate cover confirms the applicable runoff, quality and erosion targets will be met. A Traffic Impact Study submitted under a separate cover confirms the proposed development will not adversely affect the existing surrounding road network. A Flood Assessment Brief submitted under a separate cover confirms the site can be safely flood proofed without negatively impacting surrounding and downstream areas. A summary of the servicing strategy is as follows:

- Potable water will be provided by connecting into the existing 200 mm diameter regional watermain which passes through the existing site. The watermain will be rerouted through the site to allow for the proposed lot layout but the entrance and exit to site will remain the same as existing.
- Sanitary flows from the proposed development will drain to the existing 675 mm diameter regional sanitary sewer flowing north of the site. The sanitary sewer will be rerouted onsite north of the proposed units to allow for the proposed lot layout but the sewer's entrance and exit to site will remain the same as existing.
- Stormwater management quality control will be provided by a Regional Stormwater Management Facility located within the Eden Oaks Development. The site will be graded so all storm flows from all new impervious areas excluding the rooftops of lots 31 to 53 will flow to the Eden Oaks Regional SWM Facility. Runoff not entering the Eden Oaks Regional SWM facility will drain to the existing wetland on the northeast border of the project site, the post development peak flows to the wetland will not exceed the predevelopment peak flows to the wetland and all runoff draining to the wetland is considered clean. "Enhanced Level 1" quality control will be provided. The Regional SWM facility will attenuate post development storm flows but not control post development peak storm flows to pre-development levels to avoid negatively effecting flows in the downstream watercourse.
- Access to the site will be provided by connecting to a new road to be part of the proposed Eden Oaks Development. The new road within the project site will have an urban cross section and all centerline radii will conform with the Town of Blue Mountain's Engineering Standards. A traffic Impact Brief prepared separately concluded no actions are currently required to address traffic flow around the proposed project site.

- Electrical services can be accessed from the proposed site via Timmins St or the proposed Eden Oaks Development. Tatham Engineering will review electrical servicing and confirm if external plant upgrades are required to service the site. Capacity of the existing gas mains will require confirmation. Bell has confirmed an existing fibre optic cable north of the site along the Georgian Trail. Canada Post is proposed to provide postal services to the proposed development. The development is proposed to be added to the Town of Blue Mountain's waste collection system.

Additional details related to the various servicing components will be provided at the detailed design stage. Detailed drawings will be completed for approval by the Town and relevant regulatory agencies to clear the conditions of Draft Plan Approval and allow for registration of the Plan of Subdivision and the associated Subdivision Agreement.

TATHAM ENGINEERING

372 GREY ROAD 21 - WEST
LOCATION PLAN

DWG. No.
FIG. 1

SCALE: NTS	DATE: NOV/23	JOB NO. 121088

Drawing Name: 121088-FIG.1.dwg, Plotted: Jan 17, 2024

REGIONAL STORM WATER MANAGEMENT FACILITY

SEDIMENT FOREBAY

EDEN OAK DEVELOPMENT

HOME FARM DEVELOPMENT

TIMMONS STREET

GEORGIAN TRAIL

SAN MH39
TBM1
179.70

SAN MH38
TBM2
181.80

PARK BLOCK

3.0m GRANULAR TRAIL

30m WATERCOURSE SETBACK

STREET A

STREET B

R100.0m

R10.0m

R14.3m

3.0m MIN.

6.0m MIN.

12.0m MIN.

15.2m MIN.

2.4m MIN.

EXISTING SANITARY AND WATER SERVICING EASEMENT

LIMIT OF WETLAND (BY OTHERS)

WETLAND LIMITS

30m BUFFER

GEORGIAN TRAIL

FUTURE ROAD CONNECTION

PIN 37313 0139

KEY PLAN

SINGLE DETACHED LOT

ZONING STANDARD	R1-3
MINIMUM LOT AREA (m²)	360.0
MAXIMUM LOT COVERAGE	40%
MINIMUM LOT FRONTAGE (m)	12.0
MINIMUM FRONT YARD (m)	6.0
MINIMUM EXTERIOR SIDE YARD (m)	2.4
MINIMUM INTERIOR SIDE YARD (m)	1.2
MINIMUM REAR YARD (m)	6.0
MAXIMUM HEIGHT (m)	8.0
MAXIMUM HEIGHT (STOREYS)	2.0

SEMI DETACHED LOT

ZONING STANDARD	R2
MINIMUM LOT AREA (m²)	350.0
MAXIMUM LOT COVERAGE	N.A
MINIMUM LOT FRONTAGE (m)	9.0
MINIMUM FRONT YARD (m)	6.0
MINIMUM EXTERIOR SIDE YARD (m)	3.0
MINIMUM INTERIOR SIDE YARD (m)	1.2
MINIMUM REAR YARD (m)	6.0
MAXIMUM HEIGHT (STOREYS)	2.5

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BENCHMARKS

TBM1 – ELEVATION 179.70
TOP OF GRATE OF SAN. MH39 LOCATED ON TIMMONS STREET AND APPROXIMATELY 120m NORTH OF SAN. MH38 .

TBM2 – ELEVATION 181.80
TOP OF GRATE OF SAN. MH38 APPROXIMATELY 79m FROM NORTH EAST CORNER OF PROPERTY LINE.

NOTES

LEGAL SURVEY INFORMATION AND LOT DIMENSIONS SHOWN ON THIS PLAN ARE TAKEN FROM A SURVEY PLAN PREPARED BY J.D.BARNES LIMITED, DATED DEC 2, 2021 WHICH MAY NOT BE FINAL AND ARE NOT GUARANTEED. THE FINAL REGISTERED PLAN OF SUBDIVISION SHALL BE REFERRED TO FOR CONFIRMATION OF THE DATA.

TOPOGRAPHIC INFORMATION SHOWN ON THIS PLAN FROM SURVEY PREPARED BY TATHAM ENGINEERING DATED NOV 3, 2021.

No.	REVISION DESCRIPTION	DATE
1.	DRAFT PLAN PRE-CONSULT	JUL 2024
2.	DRAFT PLAN APPROVAL	JUL 2025

ENGINEER STAMP

PRELIMINARY

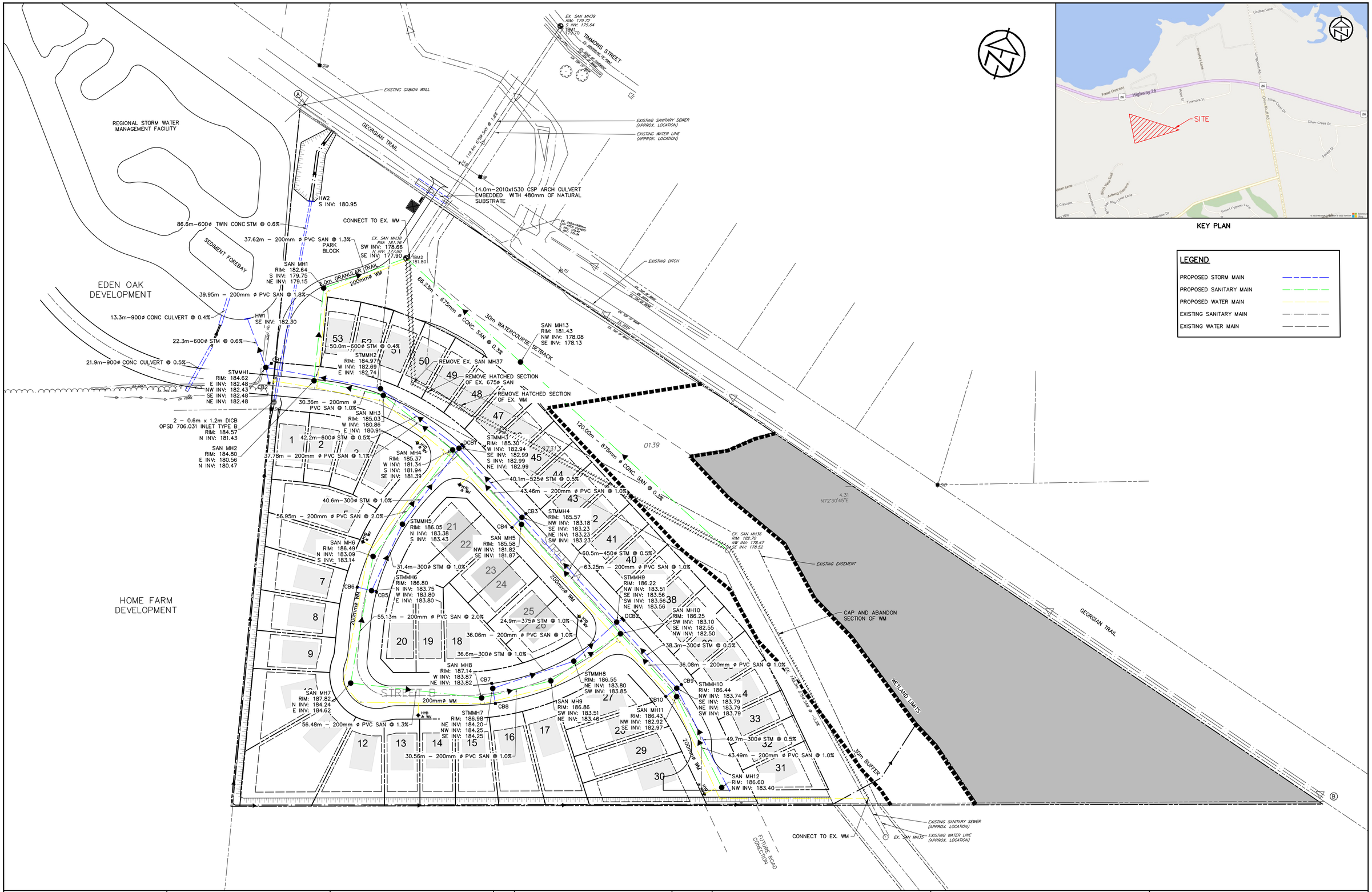
372 GREY ROAD 21 - WEST
TOWN OF THE BLUE MOUNTAINS

TATHAM ENGINEERING

DEVELOPMENT CONCEPT

DESIGN: KH/JB	FILE: 121088	DWG: SP01
DRAWN: KH	DATE: OCT 2022	
CHECK: JPA/RS	SCALE: 1:750	

Drawing Name: 121088-SP01.dwg, Plotted: Jul 23, 2025



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BENCHMARKS

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TBM2 – ELEVATION 181.80
TOP OF GRATE OF SAN. MH38 APPROXIMATELY 79m FROM NORTH EAST CORNER OF PROPERTY LINE.

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No.	REVISION DESCRIPTION	DATE
1.	DRAFT PLAN PRE-CONSULT	JUL 2024
2.	DRAFT PLAN APPROVAL	JUL 2025

ENGINEER STAMP

PRELIMINARY

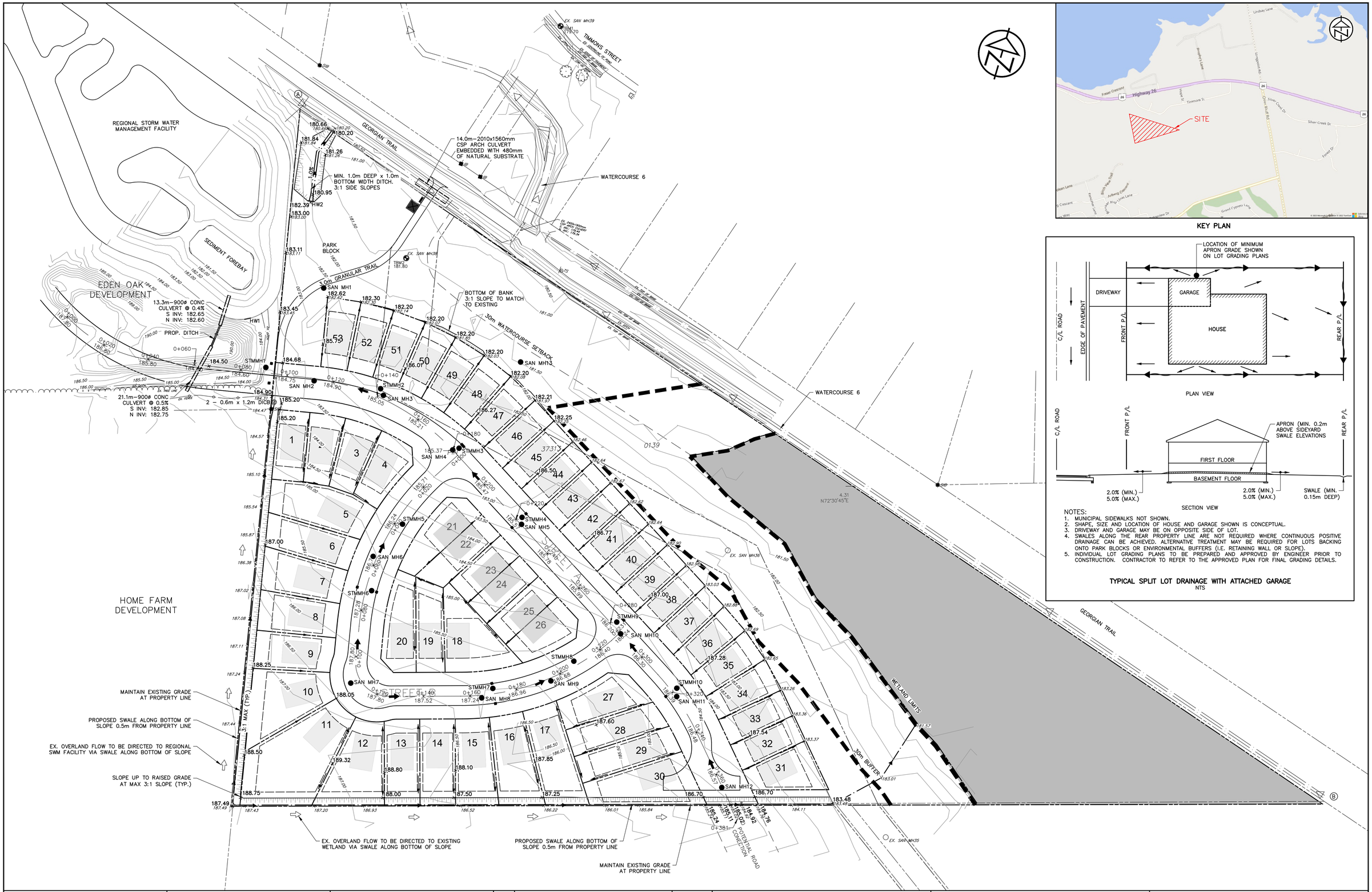
372 GREY ROAD 21 - WEST
TOWN OF THE BLUE MOUNTAINS

TATHAM ENGINEERING

GENERAL SERVICING PLAN

DESIGN: KH/JB	FILE: 121088	DWG: SS01
DRAWN: KH	DATE: JAN 2023	
CHECK: JPA/RS	SCALE: 1:750	

Drawing Name: 121088-SS01.dwg, Plotted: Jul 23, 2025



KEY PLAN

NOTES:
1. MUNICIPAL SIDEWALKS NOT SHOWN.
2. SHAPE, SIZE AND LOCATION OF HOUSE AND GARAGE SHOWN IS CONCEPTUAL.
3. DRIVEWAY AND GARAGE MAY BE ON OPPOSITE SIDE OF LOT.
4. SWALES ALONG THE REAR PROPERTY LINE ARE NOT REQUIRED WHERE CONTINUOUS POSITIVE DRAINAGE CAN BE ACHIEVED. ALTERNATIVE TREATMENT MAY BE REQUIRED FOR LOTS BACKING ONTO PARK BLOCKS OR ENVIRONMENTAL BUFFERS (I.E. RETAINING WALL OR SLOPE).
5. INDIVIDUAL LOT GRADING PLANS TO BE PREPARED AND APPROVED BY ENGINEER PRIOR TO CONSTRUCTION. CONTRACTOR TO REFER TO THE APPROVED PLAN FOR FINAL GRADING DETAILS.

TYPICAL SPLIT LOT DRAINAGE WITH ATTACHED GARAGE
NTS

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TOPOGRAPHIC INFORMATION SHOWN ON THIS PLAN FROM SURVEY PREPARED BY TATHAM ENGINEERING DATED NOV 3, 2021.

No.	REVISION DESCRIPTION	DATE
1.	DRAFT PLAN PRE-CONSULT	JUL 2024
2.	DRAFT PLAN APPROVAL	JUL 2025

ENGINEER STAMP

PRELIMINARY

372 GREY ROAD 21 - WEST
TOWN OF THE BLUE MOUNTAINS

GRADING PLAN

TATHAM ENGINEERING

DESIGN: KH	FILE: 121088	DWG: SG01
DRAWN: KH	DATE: JAN 2023	
CHECK: JPA/RS	SCALE: 1:750	

Drawing Name: 121088-SG01.dwg, Plotted: Jul 23, 2025

KEY PLAN

LEGEND

EX. MAJOR OVERLAND FLOW DIRECTION

EX. DITCH FLOW DIRECTION

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TOPOGRAPHIC INFORMATION SHOWN ON THIS PLAN FROM SURVEY PREPARED BY TATHAM ENGINEERING DATED NOV 3, 2021.

No.	REVISION DESCRIPTION	DATE
1.	DRAFT PLAN PRE-CONSULT	JUL 2024
2.	DRAFT PLAN APPROVAL	JUL 2025

ENGINEER STAMP

PRELIMINARY

372 GREY ROAD 21 - WEST
TOWN OF THE BLUE MOUNTAINS

PRE-DEVELOPMENT DRAINAGE PLAN

TATHAM ENGINEERING

DESIGN: JB	FILE: 121088	DWG: DP01
DRAWN: KH	DATE: OCT 2022	
CHECK: JPA/RS	SCALE: 1:750	

Drawing Name: 121088-STM01.dwg, Plotted: Jul 23, 2025

KEY PLAN

LEGEND

- AREA BOUNDARY
- PR. MAJOR OVERLAND FLOW DIRECTION
- EX. MAJOR OVERLAND FLOW DIRECTION
- CATCHMENT ID
- AREA (ha)
- PERCENT IMPERVIOUS (%)

201
3.33 51

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.

BENCHMARKS

TBM1 – ELEVATION 179.70
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TOPOGRAPHIC INFORMATION SHOWN ON THIS PLAN FROM SURVEY PREPARED BY TATHAM ENGINEERING DATED NOV 3, 2021.

No.	REVISION DESCRIPTION	DATE
1.	DRAFT PLAN PRE-CONSULT	JUL 2024
2.	DRAFT PLAN APPROVAL	JUL 2025

ENGINEER STAMP

PRELIMINARY

372 GREY ROAD 21 - WEST
TOWN OF THE BLUE MOUNTAINS

TATHAM ENGINEERING

POST-DEVELOPMENT DRAINAGE PLAN

DESIGN: JB	FILE: 121088	DWG: DP02
DRAWN: KH	DATE: OCT 2022	
CHECK: JPA/RS	SCALE: 1:750	

Drawing Name: 121088-STM01.dwg, Plotted: Jul 23, 2025

Appendix A:
Water Demand Calculations

TATHAM ENGINEERING	Project: 372 Grey Road 21, Town of The Blue Mountains	Date:	July 22, 2025
	File No.: 121088	Designed:	JS
	Subject: Fire Flow Calculations Single Detached Home - Lot 3	Checked	JN
	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)	
		Framing Material							
1	Frame Use for Construction of Unit	Coefficient related to type of construction (Construction Coefficient) (C)	Type V - Wood Frame Construction	1.5	Ordinary Construction	**1.0**	%	N/A	
			Type IVA - Mass Timber Construction	0.8					
			Type IVB - Mass Timber Construction	0.9					
			Type IVC - Mass Timber Construction	1.0					
			Type IVD - Mass Timber Construction	1.5					
			Ordinary Construction	1.0					
			Non-combustible Construction	0.8					
			Fire Resistive Construction	0.6					
2	Total Effective Area	Largest Floor Area				**175**	m^2	N/A	
		Percentage of the Total Area of the Other Floors for Coefficient 1.0 to 1.5			**100%**	**175**			
		Percentage of the Total Area of the Other Floors for Coefficient below 1.0:							
		a) If any vertical opening in the building are unprotected, consider the two largest adjoining floor areas plus 50% of all floors immediately above them up to a maximum of eight, **or**			**50%**				
		b) If all vertical openings and exterior vertical communications are properly protected in accordance with the National Building Code, consider only the single largest Floor Area plus 25% of each of the two immediately adjoining floors.			**25%**				
		Total Effective Area				**350**			
3	Required Fire Flow without Reductions or Increases	Required Fire Flows without Reductions or Increases per FUS): (RFF= 220 x C x $A^{0.5}$)							4,000
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	%	(600)	3,400
			Limited combustible	-0.15					
			Combustible	0.00					
			Free burning	0.15					
			Rapid burning	0.25					
4.2	Reduction Due to Presence of Sprinklers	Sprinkler reduction	For a fully supervised system the conditions a), b) and c) below must be met.			0	%	-	3,400
			a) Automatic sprinkler protection designed and installed in accordance with NFPA 13	-0.3	No				
			b) Water supply is standard for both the system and the Fire Department hose lines	-0.1	No				
			c) Fully supervised system	-0.1	No				
			None	0.0	No				
4.3	Separation Distance Between Units (Use 10% for 2 hour Fire Separation between adjacent units)	Exposure distance between units	North Side (Lot 50)	Greater than 30.0 m	0.00	0.65	%	2,210	5,610
			East Side (Lot 21)	0 to 3.0 m	0.25				
			South Side (Lot 5)	10.1 to 20.0 m	0.15				
			West Side (Lot 3)	0 to 3.0 m	0.25				
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 (m^3):							720

TATHAM ENGINEERING

PROJECT	372 Grey Road 21, Town of Blue Mountains	FILE	121088
		DATE	July 22, 2025
SUBJECT	OFM Fire Flow Calculation Single Det. Home - Lot 3	NAME	JS
		PAGE	1 OF 2

Office of the Fire Marshal, OFM Guideline, Fire Protection Water Supply Guideline for Part 3 in the Ontario Building Code (OBC), October 1999

$Q = KVS_{TOT}$ Where: Q = minimum supply of water in litres (L)
K = water supply coefficient from Table 1
V = total building volume in cubic metres (m^3)
S_{TOT} = total of spatial coeff. values from property line exposures on all sides

$S_{TOT} = 1.0 + [S_{side\ 1} + S_{side\ 2}$ + etc.]
Where: S_{side} values are obtained from Figure 1 and modified accordingly
S_{TOT} need not exceed 2.0

According to OBC Table 3.1.2.1. Classification of Buildings, the major occupancy classification of the building is: **C - Residential**

Determining the Water Supply Coefficient

Assuming the building is made of combustible construction with fire separations but no fire-resistance ratings provided in accordance with Subsection 3.2.2. of the OBC, the water supply coefficient determined by Table 1 is: **K = 23**

Determining the Total Building Volume

The total building volume should be calculated as: all spaces below and above grade within the building, measured to the underside of the roof deck.

Floor	Area (m^2)	Height (m) *	Volume (m^3)
Basement	175	3.05	533
First	175	3.05	533
Second	175	3.05	533
Roof *	-	-	265

V = 1,864 m^3

**Height and roof volumes were estimated based on common practices. To be updated during detailed design.*

Determining the Total Spatial Coefficient

Side	Exposure Distance (m)	Spatial Coefficient	
1	20	0	*Front to centre of street*
2	1.5	0.5	*East side of building to property line*
3	9	0.1	*South side of building to property line*
4	1.5	0.5	*West side of building to property line*

S_{TOT} = 1.0 + [Sside 1 + Sside 2 + Sside 3 + Sside 4] **S_{TOT} = 2.0**
= 1.0 + 0 + 0.5 + 0.1 + 0.5 = 2.1

PROJECT	372 Grey Road 21, Town of Blue Mountains	FILE	121088
		DATE	July 22, 2025
SUBJECT	OFM Fire Flow Calculation Single Det. Home - Lot 3	NAME	JS
		PAGE	2 OF 2

Calculating the Minimum Water Supply

The minimum water supply is calculated using the variables and equation determined above.

$Q = KVS_{TOT}$

$= 23 \times 1{,}864\ m^3 \times 2.0$

$Q = 85{,}744$ L

Based on Table 2, the minimum water supply flow rate for the calculated Q is: 2,700 L/min

or: 45 L/s

Therefore, a minimum fire flow of 45 L/s should be available at a minimum pressure of 140 kPa (20 psi).

TATHAM ENGINEERING	Project: 372 Grey Road 21, Town of The Blue Mountains	Date:	July 22, 2025
	File No.: 121088	Designed:	JS
	Subject: Fire Flow Calculations Semi Detached Home - Lot 23 & 24	Checked	
	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)	
		Framing Material							
1	Frame Use for Construction of Unit	Coefficient related to type of construction (Construction Coefficient) (C)	Type V - Wood Frame Construction	1.5	Ordinary Construction	**1.0**	%	N/A	
			Type IVA - Mass Timber Construction	0.8					
			Type IVB - Mass Timber Construction	0.9					
			Type IVC - Mass Timber Construction	1.0					
			Type IVD - Mass Timber Construction	1.5					
			Ordinary Construction	1.0					
			Non-combustible Construction	0.8					
			Fire Resistive Construction	0.6					
2	Total Effective Area	Largest Floor Area				**230**	m^2	N/A	
		Percentage of the Total Area of the Other Floors for Coefficient 1.0 to 1.5			**100%**	**230**			
		Percentage of the Total Area of the Other Floors for Coefficient below 1.0:							
		a) If any vertical opening in the building are unprotected, consider the two largest adjoining floor areas plus 50% of all floors immediately above them up to a maximum of eight, **or**			**50%**				
		b) If all vertical openings and exterior vertical communications are properly protected in accordance with the National Building Code, consider only the single largest Floor Area plus 25% of each of the two immediately adjoining floors.			**25%**				
		Total Effective Area				**460**			
3	Required Fire Flow without Reductions or Increases	Required Fire Flows without Reductions or Increases per FUS): (RFF= 220 x C x $A^{0.5}$)							5,000
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	%	(750)	4,250
			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	%	-	4,250
			a) Automatic sprinkler protection designed and installed in accordance with NFPA 13	-0.3	No				
			b) Water supply is standard for both the system and the Fire Department hose lines	-0.1	No				
			c) Fully supervised system	-0.1	No				
			None	0.0	No				
4.3	Separation Distance Between Units (Use 10% for 2 hour Fire Separation between adjacent units)	Exposure distance between units	North Side (Lot 42)	Greater than 30.0 m	0.00	0.55	%	2,338	6,588
			East Side (Lot 25)	3.1 to 10.0 m	0.20				
			South Side (Lot 18)	10.1 to 20.0 m	0.15				
			West Side (Lot 22)	3.1 to 10.0 m	0.20				
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	6,588
			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

TATHAM ENGINEERING

PROJECT	372 Grey Road 21, Town of Blue Mountains	FILE	121088
		DATE	July 22, 2025
SUBJECT	OFM Fire Flow Calculation Semi-Detached - Lot 23 & 24	NAME	JS
		PAGE	1 OF 2

Office of the Fire Marshal, OFM Guideline, Fire Protection Water Supply Guideline for Part 3 in the Ontario Building Code (OBC), October 1999

$Q = KVS_{TOT}$ Where: Q = minimum supply of water in litres (L)
K = water supply coefficient from Table 1
V = total building volume in cubic metres (m^3)
S_{TOT} = total of spatial coeff. values from property line exposures on all sides

$S_{TOT} = 1.0 + [S_{side\ 1} + S_{side\ 2} + etc.]$
Where: S_{side} values are obtained from Figure 1 and modified accordingly
S_{TOT} need not exceed 2.0

According to OBC Table 3.1.2.1. Classification of Buildings, the major occupancy classification of the building is: **C - Residential**

Determining the Water Supply Coefficient

Assuming the building is made of combustible construction with fire separations but no fire-resistance ratings provided in accordance with Subsection 3.2.2. of the OBC, the water supply coefficient determined by Table 1 is: **K = 23**

Determining the Total Building Volume

The total building volume should be calculated as: all spaces below and above grade within the building, measured to the underside of the roof deck.

Floor	Area (m^2)	Height (m) *	Volume (m^3)
Basement	230	3.05	701
First	230	3.05	701
Second	230	3.05	701
Roof *	-	-	350

V = 2,453 m^3

**Height and roof volumes were estimated based on common practices. To be updated during detailed design.*

Determining the Total Spatial Coefficient

Side	Exposure Distance (m)	Spatial Coefficient	
1	18	0	*Front to centre of street*
2	4	0.5	*East side of building to property line*
3	9	0.1	*South side of building to property line*
4	4	0.5	*West side of building to property line*

S_{TOT} = 1.0 + [Sside 1 + Sside 2 + Sside 3 + Sside 4] **S_{TOT} = 2.0**
= 1.0 + 0 + 0.5 + 0.1 + 0.5 = 2.1

PROJECT	372 Grey Road 21, Town of Blue Mountains	FILE	121088
		DATE	July 22, 2025
SUBJECT	OFM Fire Flow Calculation Semi-Detached - Lot 23 & 24	NAME	JS
		PAGE	2 OF 2

Calculating the Minimum Water Supply

The minimum water supply is calculated using the variables and equation determined above.

$Q = KVS_{TOT}$

$= 23 \times 2{,}453\ m^3 \times 2.0$

$Q = 112{,}838$ L

Based on Table 2, the minimum water supply flow rate for the calculated Q is: 3,600 L/min

or: 60 L/s

Therefore, a minimum fire flow of 60 L/s should be available at a minimum pressure of 140 kPa (20 psi).

TATHAM ENGINEERING

PROJECT	372 Grey Road 21, Town of Blue Mountains	FILE	121088
		DATE	16-Nov-22
SUBJECT	Water Supply Hydraulic Grade Line Calcs	NAME	EP
		PAGE	1 OF 1

372 Grey Road 21 West HGL Based on Boundary Conditions:

Option 1: Two Connections to Existing without Trailshead connection

	Connection 1 Boundary Conditions Junction Node EO-02 (Elev. 183.00 m)			Connection 2 Boundary Conditions Junction Node J-1111 (Elev. 184.27 m)			372 Grey Road 21 West: Low Elevation (Elev. 182.50 m)			372 Grey Road 21 West: High Elevation (Elev. 187.00 m)		
	Pressure		HGL	Pressure		HGL	Pressure		HGL	Pressure		HGL
Demand Scenario	(kPa)	(psi)	(m)	(kPa)	(psi)	(m)	(kPa)	(psi)	(m)	(kPa)	(psi)	(m)
ADD	575	83	241.74	562	82	241.74	580	84	241.74	536	78	241.74
MDD + 102 L/s FF	177	26	201.08	165	24	201.09	182	26	201.09	138	20	201.08
PHD	493	72	233.35	481	70	233.43	499	72	233.43	454	66	233.35

** Shaded Grey = pressure outside the acceptable pressure range.*

Option 2: Two connections to Existing with Connection to Future Trailshead Development

	Connection 1 Boundary Conditions Junction Node EO-02 (Elev. 183.00 m)			Connection 2 Boundary Conditions Junction Node J-1111 (Elev. 184.27 m)			Connection 3 Boundary Conditions Junction Node J-1112 (Elev. 183.50 m)			372 Grey Road 21 West: Low Elevation (Elev. 182.50 m)			372 Grey Road 21 West: High Elevation (Elev. 187.00 m)		
	Pressure		HGL	Pressure		HGL	Pressure		HGL	Pressure		HGL	Pressure		HGL
Demand Scenario	(kPa)	(psi)	(m)	(kPa)	(psi)	(m)	(kPa)	(psi)	(m)	(kPa)	(psi)	(m)	(kPa)	(psi)	(m)
ADD	577	84	241.97	565	82	241.97	572	83	241.97	583	84	241.97	539	78	241.97
MDD+133.7 L/s FF	269	39	210.51	251	36	209.89	264	38	210.45	268	39	209.89	230	33	210.51
MDD+105 L/s FF	362	53	220.01	346	50	219.63	357	52	219.98	364	53	219.63	323	47	220.01
PHD	489	71	233.01	478	69	233.10	484	70	233.00	496	72	233.10	451	65	233.01

** Shaded Grey = pressure outside the acceptable pressure range.*

TOTBM Acceptable Pressure Ranges:

Average and Maximum Day Demand:	350 - 550 kPa (50 - 80 psi)
Maximum Day plus Fire Flow:	140 - 700 kPa (20 - 100 psi)
Minimum and Peak Hour:	275 - 700 kPa (40 - 100 psi)

Jason Covey

From: Annie Williams <awilliams@jlrichards.ca>
Sent: Friday, October 14, 2022 4:48 PM
To: Deanna Vickery
Cc: Jeremy Acres; Jason Covey; Brian Worsley; Mark Buchanan; John Rodgers; Jenna Robinson; Mahad Musse
Subject: RE: 121088: 372 Grey Road 21 - FSR - Water Section
Attachments: 372 Grey Road 21 BC Results_Oct14.pdf; ET121015-1SP02-West - JRC Water Markups - Rev1-Figure - Tatham Comments.pdf; 372 Grey Rd 21 - FUS Fire Flow Calculation.xlsx; 372 Grey Rd 21 - OBC Fire Flow Calculation.pdf

Hello Deanna,

The proposed Development ("372 Grey Road 21"), located south of the Georgian Trail near Timmons Street in the Town of the Blue Mountains (Town), was simulated using the Town's updated hydraulic water model (August 2021) to determine hydraulic boundary conditions based on theoretical water demands and fire flows provided by the Developer's Engineer (refer to below and attached). Table 1 summarizes the theoretical water demands that were included in the model at the representative node J-1114 (Elev. 183.50 m).

Table 1: Theoretical Water Demands

Scenario	Demand (L/s)
Average Day	0.66
Maximum Day	1.30
Peak Hour	3.00
Required Fire Flow (FUS)	133.70
Required Fire Flow (OBC)	105.00

Two (2) sets of boundary conditions are provided in the tables below, as follows:

- Option 1 (presented in Table 2) assumes two (2) connections to the existing watermain system with no connection to the future Trailshead development to the west.
- Option 2 (presented in Table 3) assumes the same connections as Option 1 with a third connection to the future Trailshead development to the west.
  For the Trailshead connection scenario, it has been assumed that the Parkbridge and Eden Oak sites are fully built as per the most recent water system design proposed. It has also been assumed that the Parkbridge watermain is connected to Pressure Zone 4 (PZ 4) at Grey County Road 19. Should the Parkbridge or Eden Oak final approved design be modified, the boundary conditions may no longer be valid and may need to be updated.

It is noted that the existing 200 mm diameter watermain is intended to be relocated to accommodate the proposed development, and has been modelled accordingly. **Under Option 1, it is anticipated that the maximum available fire flow is limited to 102 L/s at the representative junction node J-1114** based on the minimum pressure requirement of 140 kPa. From the Town's current water model, the requested fire flows of 133.7 L/s (FUS) and 105 L/s (OBC) are not expected to be available from the existing water distribution system without the third connection to the future Trailshead development.

The hydraulic boundary conditions have been generated at the requested connection locations labelled as node EO-02, node J-1111 and node J-1112 in the model (refer to attached WaterCAD model outputs).

Table 2: 372 Grey Road 21 Boundary Conditions – Option 1: Connections to Existing

Demand Scenario	Connection 1		Connection 2	
	Junction Node EO-02 (Elev. 183.00 m)		Junction Node J-1111 (Elev. 184.27 m)	
	Pressure (kPa)	HGL (m)	Pressure (kPa)	HGL (m)

Average Day	575	241.74	562	241.74
Max Day + Fire Flow (102 L/s)	177	201.08	165	201.09
Peak Hour	493	233.35	481	233.43

Table 3: 372 Grey Road 21 Boundary Conditions – Option 2: Extension to Future Development

Demand Scenario	Connection 1		Connection 2		Connection 3	
	Junction Node EO-02 (Elev. 183.00 m)		Junction Node J-1111 (Elev. 184.27 m)		Junction Node J-1112 (Elev. 183.50 m)	
	Pressure (kPa)	HGL (m)	Pressure (kPa)	HGL (m)	Pressure (kPa)	HGL (m)
Average Day	577	241.97	565	241.97	572	241.97
Max Day + Fire Flow (133.7 L/s)	269	210.51	251	209.89	264	210.45
Max Day + Fire Flow (105 L/s)	362	220.01	346	219.63	357	219.98
Peak Hour	489	233.01	478	233.10	484	233.00

Note that the foregoing model results are for current conditions and are based on computer model simulation. We have not reviewed the adequacy of the domestic demand nor the fire flow requirements for the proposed development, which remains the responsibility of the Developer's Engineer.

Disclaimer: The model results are based on current simulated operation of the Town's water distribution system. The computer model simulation is based on the best information available at this time. The operation of the water distribution system can change on a regular basis, resulting in a variation in the boundary conditions. It is further noted that the operational characteristics of the water supply system and physical properties of the watermains can change and/or deteriorate over time. These changes may affect the supply characteristics of the system and the assumptions made in developing the model, which in turn could lead to variations in the simulation results. This should be considered by any third party undertaking simulation of system upgrades.

Please do not hesitate to contact me should you have any questions regarding the foregoing.

Regards,
Annie

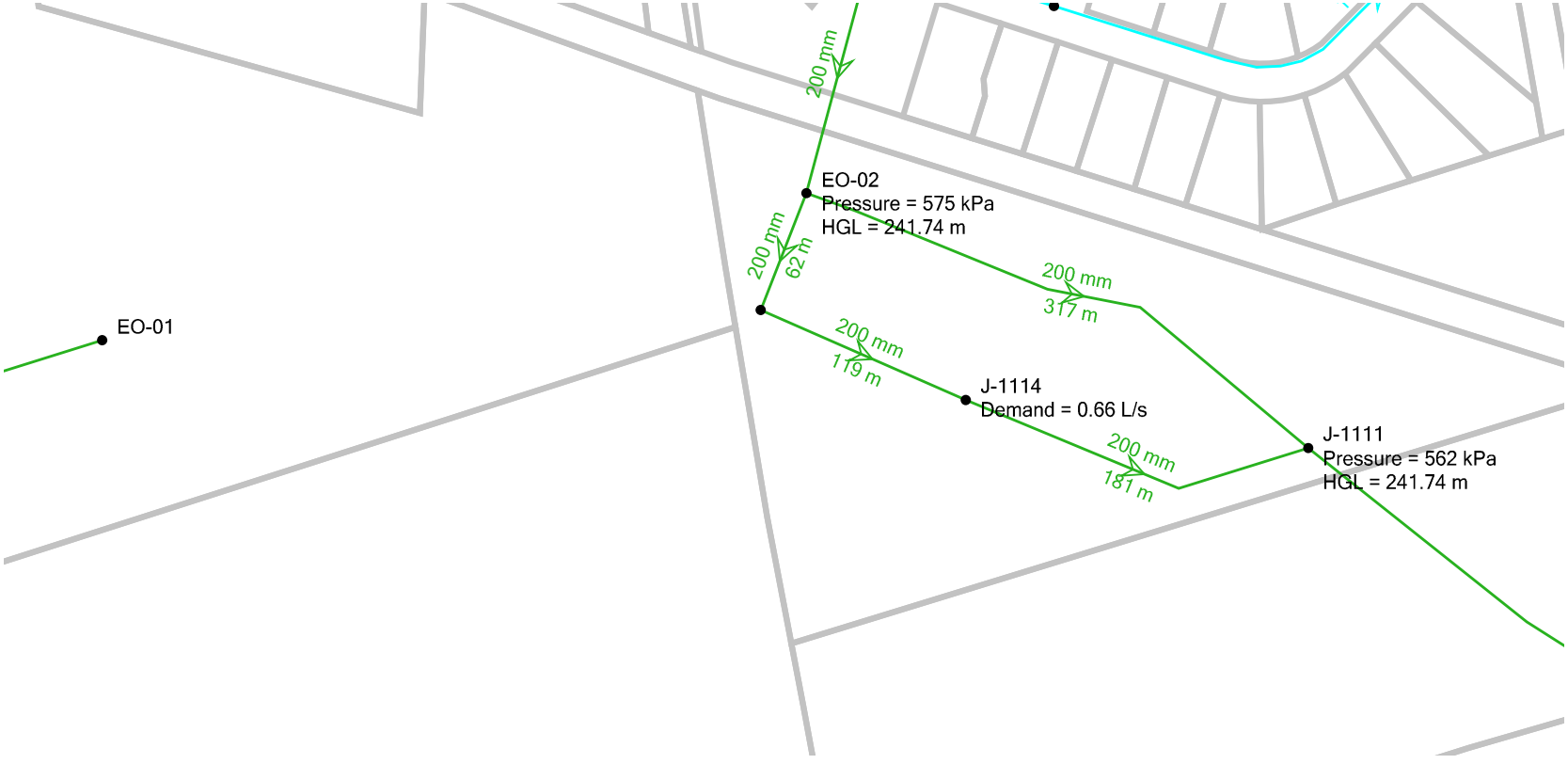
Annie Williams, P.Eng.
Civil Engineer

J.L. Richards & Associates Limited
1000-343 Preston Street, Ottawa, ON K1S 1N4
Direct: 343-803-4523

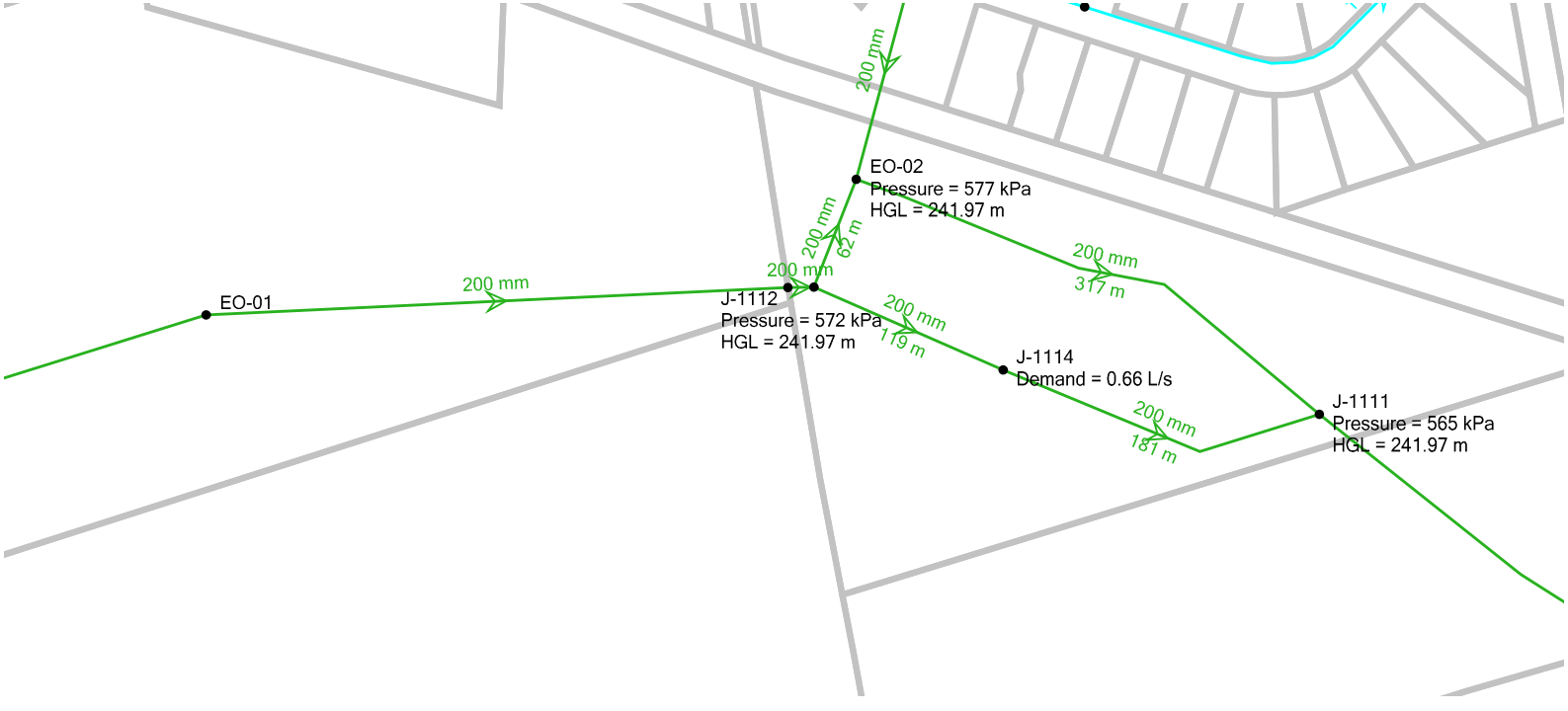
From: Jeremy Acres <jacres@tathameng.com>
Sent: October 3, 2022 10:19 AM
To: Annie Williams <awilliams@jlrichards.ca>; Deanna Vickery <dvickery@thebluemountains.ca>
Cc: Jason Covey <jcovey@tathameng.com>; Brian Worsley <bworsley@thebluemountains.ca>; Mark Buchanan <mbuchanan@jlrichards.ca>; John Rodgers <john@rhemmproperties.com>; Jenna Robinson <jrobinson@thebluemountains.ca>
Subject: RE: 121088: 372 Grey Road 21 - FSR - Water Section

Good morning Annie,

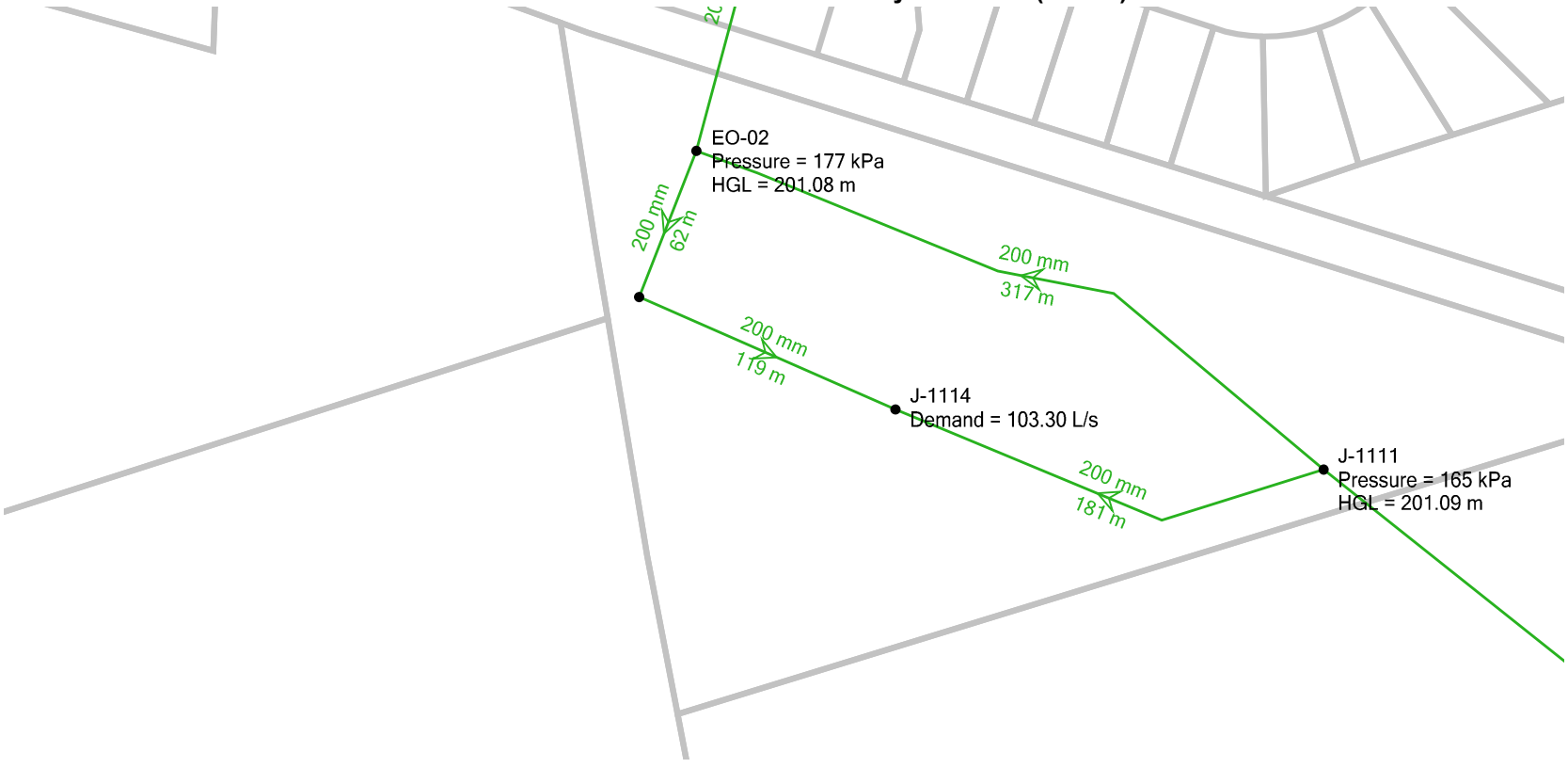
TOWN OF THE BLUE MOUNTAINS
372 Grey Road 21 - Boundary Conditions
Average Day Demand



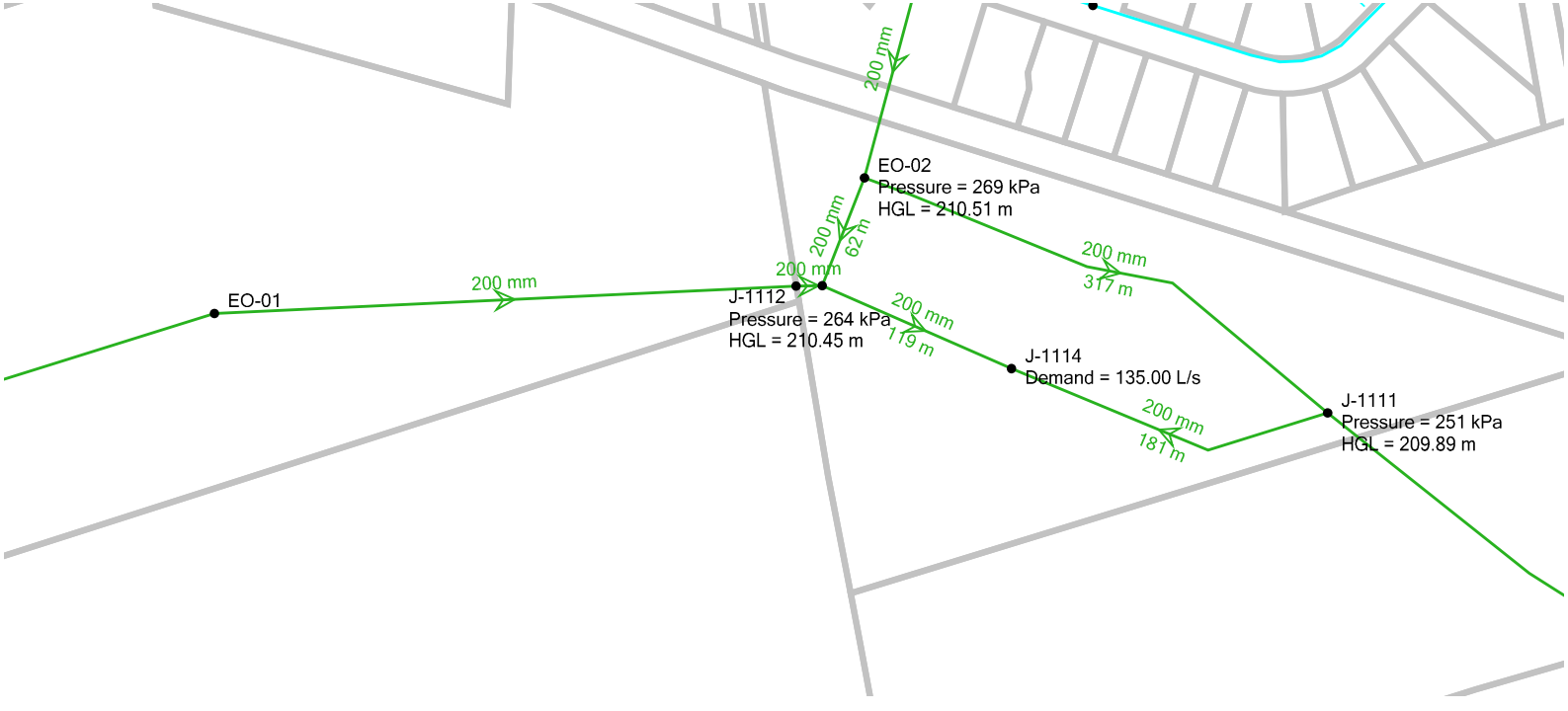
TOWN OF THE BLUE MOUNTAINS
372 Grey Road 21 - Boundary Conditions
Average Day Demand
Extension to Future Development



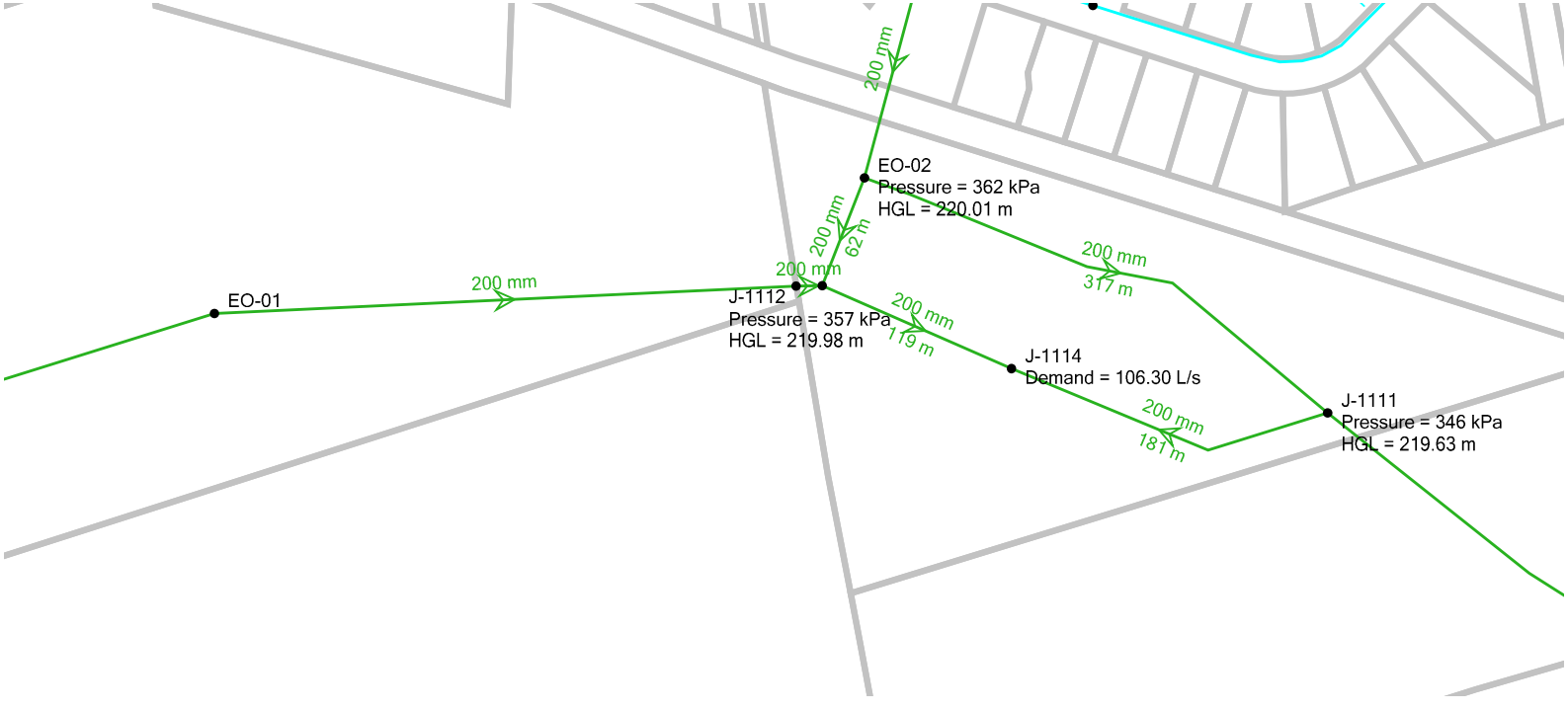
TOWN OF THE BLUE MOUNTAINS
372 Grey Road 21 - Boundary Conditions
Maximum Day + Fire Flow (102 L/s)



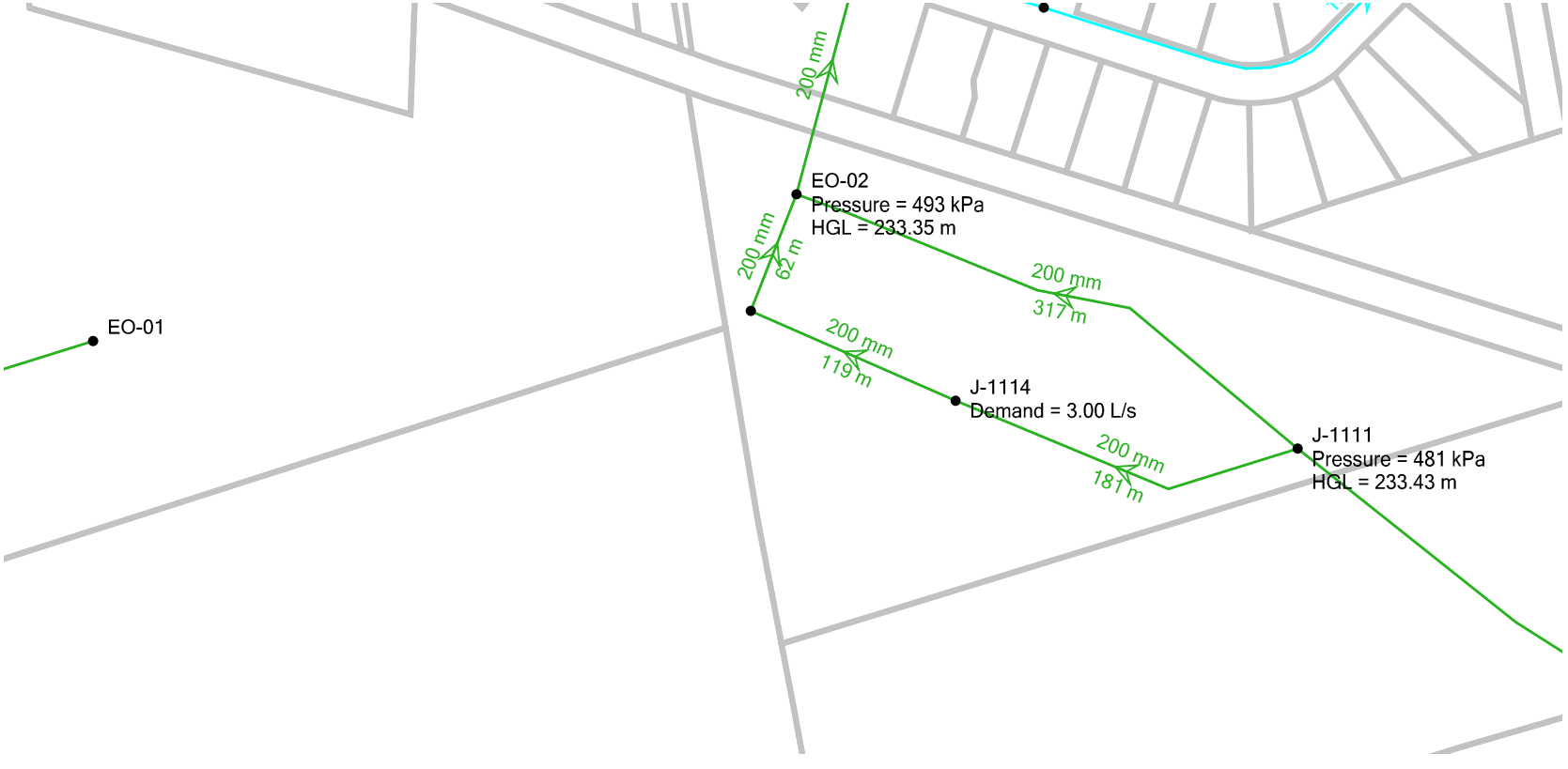
TOWN OF THE BLUE MOUNTAINS
372 Grey Road 21 - Boundary Conditions
Maximum Day + Fire Flow (133.7 L/s)
Extension to Future Development



TOWN OF THE BLUE MOUNTAINS
372 Grey Road 21 - Boundary Conditions
Maximum Day + Fire Flow (105 L/s)
Extension to Future Development



TOWN OF THE BLUE MOUNTAINS
372 Grey Road 21 - Boundary Conditions
Peak Hour Demand



TOWN OF THE BLUE MOUNTAINS
372 Grey Road 21 - Boundary Conditions
Peak Hour Demand
Extension to Future Development