February 8, 2021

Our File: 2021-5021

The Jones Consulting Group Ltd.
229 Mapleview Drive East, Unit 1
Barrie, ON
L4N 0W5

SCHAEFFERS
CONSULTING ENGINEERS

6 Ronrose Drive, Vaughan, Ontario L4K 4R3
Tel: (905) 738-6100 Fax: (905) 738-6875
Tor. Line: (416) 213-5590 E-mail: general@schaeffers.com

Attention: Mr. Michael Flis, P.Eng.
Project Engineer

Dear Mr. Flis,

RE: InfoWater Modeling Brief
Water Supply Scheme for Bistro 6 West Site (Block 598)
Barrie Annexation Lands, City of Barrie

1. Introduction

Schaeffer & Associates Ltd. have been retained by Pratt Development Inc. to provide a water supply analysis for Bistro 6 West site development (also known as Block 598). The subject site is bounded by existing development along Yonge Street to the west, Mapleview Drive East to the north, future Kneeshaw Drive to the east and planned residential subdivision to the south.

2. Scope of Work

Pratt Development Inc. has asked Schaeffer & Associates Ltd. on January 21st, 2021 to complete a water supply analysis for Bistro 6 West Site in order to confirm the size of the watermains within the development and to verify proposed servicing satisfies the City of Barrie criteria. Pratt Development Inc. proposes two connections to 300 mm watermain on Kneeshaw Drive to ensure enough water flow for residential demand and fire flow. The two connections to future Kneeshaw Drive have been analyzed to ensure water supply demands and fire flow are met. Kneeshaw Drive watermain will connect to the 300mm Mapleview Drive East watermain and 600mm transmission main south of the subject site.

Schaeffer & Associates Ltd. used the City of Barrie Zones 2S and 3S InfoWater model received from the City in August 2020 to support the water supply analysis. Subject site grading and

servicing plan were provided by The Jones Consulting Group, drawing *Site Grading Plan, SG-1, Project PRA-19078*, dated 2021-01-15, and drawing *Site Servicing Plan, SS-1, Project PRA-19078*, dated 2021-01-15. Fire Flow Calculations were performed by The Jones Consulting Group, and the summary of the required fire flows and fire wall locations within the buildings are presented in drawing *Pratt Hansen Group – Bistro 6 West – Site Plan,* dated 2021-01-20.

3. Water Supply Design Criteria

The City of Barrie and MOE design criteria were applied to determine the required flows and confirm the required pressures being achieved throughout the water supply system.

- Water demand was calculated using an average daily demand of 225 l/cap/day and population density of 1.67 ppu for high density residential units (apartments buildings), 50 persons per hectare for parks.

- Peaking factors per MOE for population of 500-1000 are as follows: Maximum Daily Flow = 2.75, Minimum Hour Flow = 0.4, Peak Hour Flow = 4.13. Peaking factor for the Maximum Daily Flow was used in the InfoWater fire flow scenario *2020MDD_FF, Steady State FF Simulation,* while in the Average Day Demand scenario *2020ADD, 2016 Calibration,* City of Barrie diurnal demand pattern PAT2S-CAL-RES, Zone 2S Residential Pattern was used.

- Fire demands: minimum 200 l/s at 20 psi for high-density residential areas, as per the City of Barrie recommendation. It is recommended to calculate fire flow using Water Supply for Public Fire Protection by the Fire Underwriters Survery for each object. The calculations have been performed by Jones and are presented in the Attachment.

- Maximum velocity of 5 m/s in a watermain during the fire flow conditions.

- Hazen-Williams formula was applied for computing the size of watermain pipes. The actual Hazen-Williams "C" values used in the WaterCAD model are listed in **Table 1**.

Table 1 Hazen-Williams Coefficients

Pipe Diameter(mm)	Hazen-Williams Coefficient
150	100
200 – 250	110
300 – 600	120
Over 600	130

- The boundary condition for the InfoWater model was taken from the City of Barrie Water Supply Model. In the model Scenario *2020ADD, 2016 Calibration* the boundary condition ranged from 306.65m to 311.19m and in *2020MDD_FF, Steady State FF Simulation* scenario the boundary condition was 305.08m. These boundary conditions will be confirmed by a hydrant test once the conditions allow for a hydrant test to be performed.

4. Water Supply Analysis and Results

The subject site consists of three (3) six-floor residential buildings. Buildings 'A' and 'C' are proposed to have 96 units each, while building 'B' is proposed to have 156 units. The total approximate population for the site is 583 residents. The site will be serviced by two proposed connections to the proposed Kneeshaw 300mm diameter watermain. Both connections will feature concrete chambers housing backflow check valves. Extended Period Simulation (EPS) of Average Day Demand scenario and steady state Maximum Day Demand + Fire Flow scenario have been modeled. Subject site is proposed to be serviced with internal 300mm diameter watermains. This watermain size is proposed due to the required fire flows which cannot be serviced with a 250mm watermain configuration due to watermain velocity inside 250mm watermain being over 5 m/s in a fire flow condition. Each building will have a 100mm domestic supply connection and a 150mm fire connection to the site watermain. There will be four (4) hydrants inside the site covering all of the buildings. Additionally, there will be three more hydrants on Kneeshaw Drive in front of the site. Residential water supply and fire flow requirements are met with the proposed servicing. InfoWater analysis results are provided in the Attachment for reference.

5. Water Age Analysis

The Watermain water age was modeled in InfoWater to ensure the sufficient renewal of the potable water system will be happening in the proposed subject site. The required water age is 3 to 5 days. Occupancy phasing is not available at this time. The maximum water age in the subject site at full occupancy in model nodes and pipes was 43 hours (1.8 days).

6. Conclusion

The residential demand and fire flow requirements are met across Bistro 6 West site using two connections to the future Kneeshaw Drive 300mm watermain. Both site connections will feature backflow check valves in concrete chambers. The site will be serviced internally with 300mm watermains. Kneeshaw Drive 300mm watermain will connect to the 300mm watermain on Mapleview Drive and 600mm transmission watermain south of the site.

Should you have questions or comments, please do not hesitate to contact the undersigned.

Respectfully Submitted,

SCHAEFFERS CONSULTING ENGINEERS

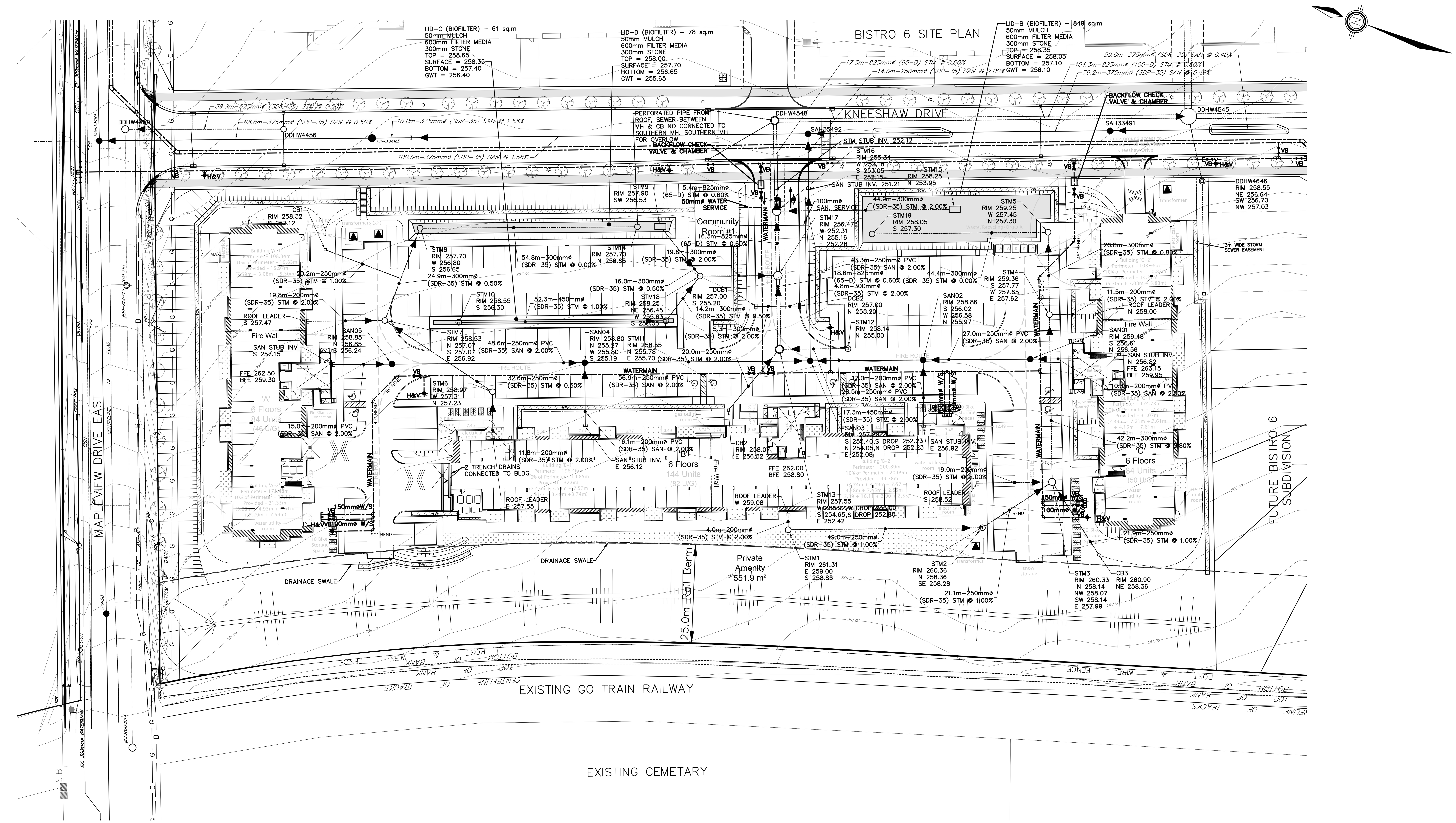
Feb 8/2021

Bogdan Pavlovic, **MESc., EIT**
Water Resources Analyst

Koryun Shahbikian, **LLM, M.Eng., P.Eng.**
Partner

ATTACHMENT

Background Information



LEGEND

STM1	PROPOSED MAINTENANCE HOLE
CBMH7	PROPOSED CATCHBASIN MAINTENANCE HOLE
CB1	PROPOSED CATCHBASIN
SAN01	PROPOSED SANITARY MAINTENANCE HOLE
H&V	PROPOSED HYDRANT
VB	PROPOSED VALVE BOX

BENCHMARK:

BENCHMARK NO: 01019865454 LOCATED ON CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE E OVER LOVER'S CREEK, 0.65KM EAST OF HURONIA ROAD. TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45M NORTH OF CENTRELINE OF ROAD, 28CM WEST OF THE NORTHEAST END OF BRIDGE, 19CM TOP OF COPING. N4910788.889 E607264.100 ELEV 241.861

BENCHMARK NO: 03120030029 MAPLEVIEW HEIGHTS ELEMENTARY SCHOOL – 180 ESTHER DR. THE VERTICAL MONUMENT IS SET FLUSH IN CONCRETE FLAGPOLE BASE 4.7m SOUTH FROM THE SOUTHEAST CORNER OF THE MAIN ENTRANCE TO SCHOOL AND TABLET IS ON THE SOUTHSIDE OF THE FLAGPOLE BASE. N4911610 E607799 ELEV 250.508

BENCHMARK NO: 03120080054 LOCATED ON THE SOUTH LIMIT OF MAPLEVIEW DRIVE WEST APPROXIMATELY 1km EAST OF HURONIA ROAD. N4910878.122 E607601.062 ELEV 248.996

BENCHMARK NO: 03120110013 LOCATED ON LOCKHART ROAD ON THE NORTH SIDE OF THE BOULEVARD. APPROXIMATELY 1.02km WEST OF THE YONGE STREET AND HURONIA ROAD INTERSECTION N49009870.257 E608733.580 ELEV 252.807

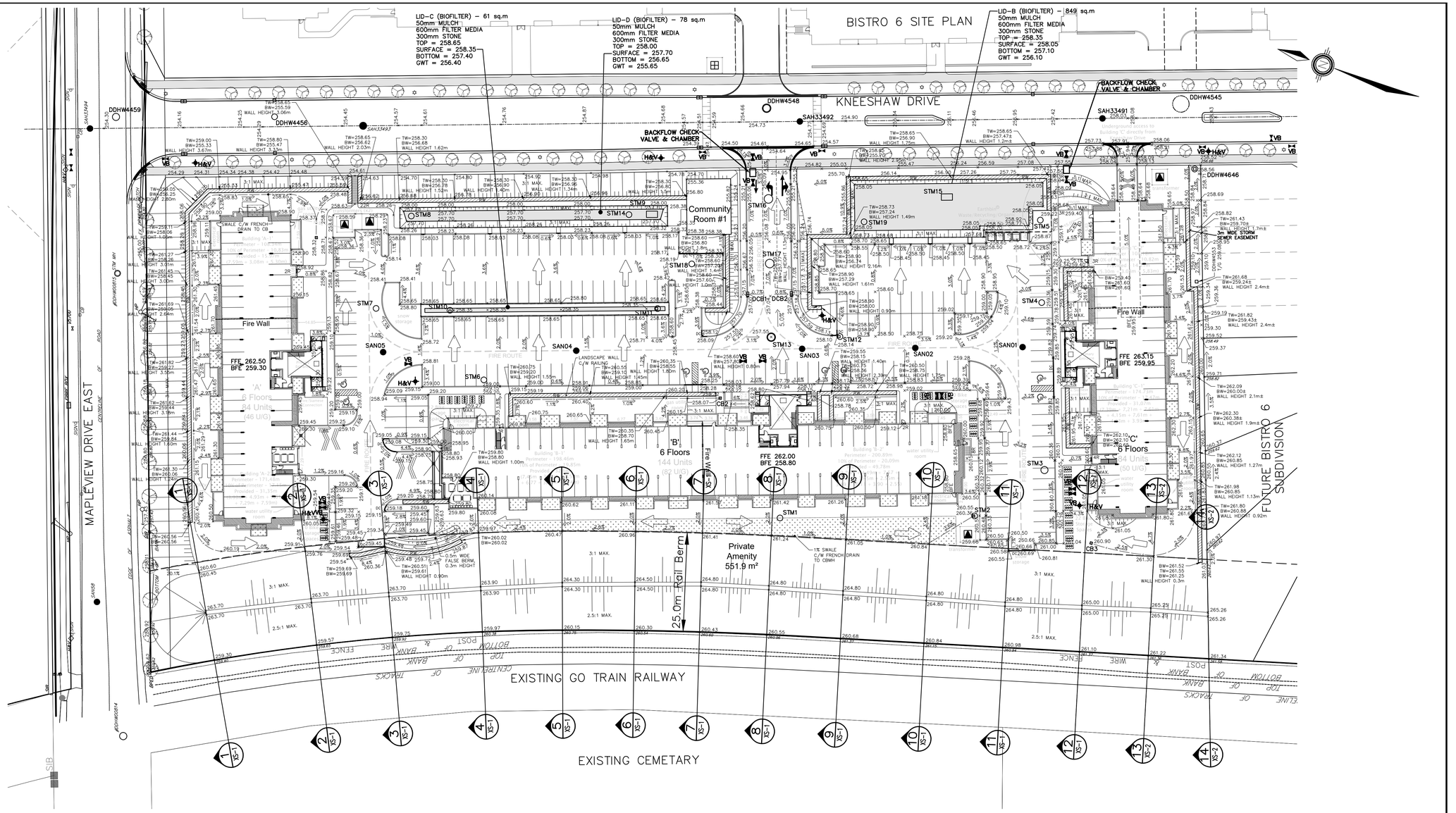
NO.	REVISIONS	DATE	INITIAL
1	ISSUED FOR PRE-CONSULTATION	21-02-11	DR

PRATT HANSEN GROUP INC.
BISTRO 6 WEST
CITY OF BARRIE

SITE SERVICING PLAN

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN DR/KS	SCALE: 1:500	DATE APRIL 2020
DRAWN KS	PROJECT PRA-19078	DWG. Nº SS-1
CHECKED DR		



LEGEND

- PROPOSED GROUND ELEVATION / EXISTING GROUND ELEVATION
- PROPOSED GRADIENT AND DIRECTION
- PROPOSED 3:1 SLOPE (MAX.)
- STM1 — PROPOSED MAINTENANCE HOLE
- CBMH7 — PROPOSED CATCHBASIN MAINTENANCE HOLE
- CB1 — PROPOSED CATCHBASIN
- SAN01 — PROPOSED SANITARY MAINTENANCE HOLE
- H&V — PROPOSED HYDRANT
- VB — PROPOSED VALVE BOX
- PROPOSED EMERGENCY OVERLAND FLOW ROUTE

BENCHMARK:

BENCHMARK NO: 01019865454 LOCATED ON CONCRETE BRIDGE CARRYING MAPLEVIEW DRIVE E. OVER LOVER'S CREEK, 0.65KM EAST OF HURONIA ROAD. TABLET IS SET HORIZONTALLY IN THE NORTH FACE, 5.45M NORTH OF CENTRELINE OF ROAD, 28CM WEST OF THE NORTHEAST END OF BRIDGE, 19CM TOP OF COPING. N4910788.889 E607264.100 ELEV 241.861

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NO.	REVISIONS	DATE	INITIAL
1	ISSUED FOR PRE-CONSULTATION	21-02-11	DR

PRATT HANSEN GROUP INC.
BISTRO 6 WEST
CITY OF BARRIE

SITE GRADING PLAN

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Dr. E, Unit 1
Barrie, ON L4N 0W5
P. 705.734.2538
F. 705.734.1056

DESIGN DR/KS	SCALE: 1:500	DATE APRIL 2020
DRAWN KS	PROJECT PRA-19078	DWG. Nº SG-1
CHECKED DR		

(PROPOSED BLOCK 597 & RESIDENTIAL LOTS ON HEWITT'S GATE DRAFT PLAN OF SUBDIVISION)

TEMPORARY ACCESS

PROPOSED KNEESHAW DRIVE

FUTURE MAJOR COLLECTOR

1.2m GRAVEL SHOULDER

ASPHALT SURFACE

GRAVEL SURFACE

TOP OF SPINDLE OF FUTURE MAPLEVIEW DRIVE EAST WIDENING ELEV. 261.44

FUTURE MAPLEVIEW DRIVE EAST WIDENING

FUT. 2.5m WIDE CONCRETE SW

Underground access to Building 'C' directly from Kneeshaw Drive

BUILDING A EAST
167 L/S

BUILDING A WEST
250 L/S

BUILDING B NORTH
267 L/S

BUILDING B SOUTH
267 L/S

BUILDING C EAST
200 L/S

BUILDING C WEST
283 L/S

Proposed LID (347 m²)

Proposed LID (187 m²)

Proposed LID (765 m²)

Community Room #1

Earthbin® Waste/Recycling/Organic System

gas utility room

transformers (x2)

transformer

electrical room

Primary Entrance

Fire/Siamese Connection

snow storage

FIRE ROUTE

Fire Wall

'A'
6 Floors
96 Units
(46 U/G)

'B'
6 Floors
156 Units
(82 U/G)

'C'
6 Floors
96 Units
(50 U/G)

Building 'A-1'
Perimeter = 108.34m
10% of Perimeter = 10.83m
Provided = 15.77m
(7.59m + 3.08m + 5.30m)

Building 'A-2'
Perimeter = 171.48m
10% of Perimeter = 17.15m
Provided = 31.35m
(3.93m + 4.93m + 7.61m + 7.29m + 7.59m)

Building 'B-1'
Perimeter = 198.46m
10% of Perimeter = 19.85m
Provided = 32.6m
(7.45m + 3.58m + 7.57m + 6.77 + 3.49m + 3.74m)

Building 'B-2'
Perimeter = 200.89m
10% of Perimeter = 20.09m
Provided = 49.78m
(3.74m + 4.49m + 7.67 + 3.58m + 7.45m + 2.55m + 3.89 + 10.11 + 3.90 + 2.55)

Building 'C-2'
Perimeter = 108.18m
10% of Perimeter = 10.82m
Provided = 14.2m
(5.30m + 3.08m + 5.83m)

Building 'C-1'
Perimeter = 174.73m
10% of Perimeter = 17.47m
Provided = 31.07m
(7.39m + 7.21m + 2.61m + 4.15m + 7.61m + 4.93m + 3.93m)

water utility room

spare utility room

10 Bike Storage Spaces

12 Bike Storage Spaces

20 Bike Storage Spaces

22 Bike Storage Spaces

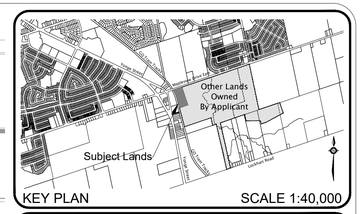
Private Amenity 551.9 m²

R = 516.39m A = 102.06m CB = N23° 49' 39"W CD = 101.89m

R = 998.31m A = 61.47m CB = N16° 34' 09"W CD = 61.46m

EXISTING GO TRAIN RAILWAY

EXISTING CEMETARY



KEY PLAN SCALE 1:40,000

Site Plan

(Proposed Block 598 on Hewitt's Gate Draft Plan)
Part of Lot 16, Concession 12
City of Barrie, County of Simcoe, 2021

SITE PLAN STATISTICS

Site Plan Area	3.15 ha.

Unit Count:

2 @ 96 Unit Apartment (6 Storey 'A' & 'C')	192 Units
1 @ 156 Unit Apartment (6 Storey 'B')	156 Units
Total	348 Units (110 uph)

	REQUIRED	PROPOSED
Total Holdings	RM3	RM3
Site Plan Area	-	3.15 ha.
Lot Frontage	24.0 m	123.2 m
Front Yard	3.0 m	15.6 m
Interior Side Yard	5.0 m	30.0 m
Exterior Side Yard	2.0 m	7.3 m
Rear Yard	5.0 m	6.6 m
Lot Coverage	max 50 % (1.57 ha.)	18 % (0.57 ha.)
Accessory Structures	max 10 % (0.31 ha.)	0.01 % (0.03 ha.)
Landscape Open Space	min 25 % (0.79 ha.)	54 % (1.70 ha.)
Parking Coverage	max 40 % (1.26 ha.)	25 % (0.79 ha.)
Gross Floor Area	max 200 % (6.30 ha.)	110 % (3.43 ha.)

Building A
- GFA 9,468.24 m2
- Height in Stories 6
- Units 96

Building B
- GFA 15,398.28 m2
- Height in Stories 6
- Units 156

Building C
- GFA 9,468.24 m2
- Height in Stories 6
- Units 96

Parking Calculations

Required Parking (348 x 1.2)	418 Spaces	*419 Spaces

*Parking Breakdown

Typical Surface Parking Spaces	227 Spaces
Tandem Parking Spaces	6 Spaces
Surface Barrier Free Parking Spaces	8 Spaces
Typical Underground Parking Spaces	175 Spaces
Underground Barrier Free Parking Spaces	3 Spaces
Total	419 Spaces

Barrier Free spaces calculated at 1 + (418 x 3%) = 13 required
(3.4 + 1.5 & 3.1 + 1.5 per barrier free space/shared aisle)

Bicycle Rack Storage (.2 x 312) 62 Required 64 Provided

General Amenity Area (10m²/unit) 3,480 m² **4,574.50 m²

**Amenity Area Breakdown

Shared Surface Amenity Area	550.9 m²
Private Balcony Area:	
- Building A	1,167.54 m²
- Building B	1,829.46 m²
- Building C	1,026.60 m²
- Private Balcony Area Total	4,023.60 m²
Combined General Amenity Area Total	4,574.50 m²

Fire Route ----------
Retaining Walls
Swale

Internal Stop Control sidewalk

0 5 10 20 30M

SCALE 1 : 400 (A1)

PRATT HANSEN GROUP - BISTRO 6 WEST - SITE PLAN

SCHEDULE OF REVISIONS

DATE	DESCRIPTION	DRAWN
JUNE 16, 2020	REDUCE WIDTH AND REMOVE ENTRANCE ISLAND	m.c.r.
AUGUST 6, 2020	CONCEPT 15	m.c.r.
AUGUST 7, 2020	CONCEPT 15a (REVISIONS AS PER ENG COMMENTS)	m.c.r.
AUGUST 25, 2020	CONCEPT 16 CREATED	m.c.r.
SEPT. 14, 2020	NEW ARCH LARGER FOOTPRINT OVERLAID TO CP 16	m.c.r.
SEPT. 21, 2020	NEW ARCH FOOTPRINT (BDG 'A' & 'B') OVERLAID TO CP 16	m.c.r.
SEPT. 22, 2020	REVISIONS AS PER COMMENTS	m.c.r.
OCT. 05, 2020	NEW ARCH FOOTPRINTS FOR BDG 'A', 'B', & 'C'/UPDATE SP	m.c.r.
OCT. 06, 2020	NEW ARCH ALIGNMENTS FOR BDG 'A', & 'B'	m.c.r.
NOV. 04, 2020	NEW FOOTPRINT FOR BDG 'C'/UPDATE STATS FOR SUBMISSION	m.c.r.
NOV. 05, 2020	ENG COMMENTS AND CHANGE LOCATION FOR TRANSFORMER	m.c.r.
NOV. 06, 2020	FIRE ROUTE PULLED OUT FROM GARBAGE STORAGE AREA	m.c.r.
NOV. 24, 2020	CHANGES AS PER MARK UP PLAN NOV. 24/2020	m.c.r.
NOV. 24, 2020	CHANGES AS PER MARK UP PLAN NOV. 24/2020 x2	m.c.r.
NOV. 25, 2020	CHANGES AS PER MARK UP PLAN NOV. 24/2020 x3	m.c.r.
NOV. 26, 2020	CREATE NEW CONCEPT PLAN	m.c.r.
DEC. 2, 2020	UPDATED SP WITH NEW BDG 'A', 'B', AND 'C' ARCHITECT FOOTPRINTS	m.c.r.
DEC. 3, 2020	MINOR REVISIONS TO SP/TRUCK TURN TEMPLATE	m.c.r.
DEC. 18, 2020	NEW ARCH FOOTPRINTS/CHANGES AS PER ENG COMMENTS	m.c.r.
DEC. 21, 2020	MINOR REVISIONS TO SP	m.c.r.
JAN. 05, 2020	NEW ARCH FOOTPRINTS/CHANGES AS PER ENG COMMENTS	m.c.r.
JAN. 06, 2020	NEW ARCH FOOTPRINTS	m.c.r.
JAN. 07, 2020	MINOR REVISIONS TO SP	m.c.r.
JAN. 18, 2020	REMOVE ONE COMMUNITY BDG/UP UNITS PER BUILDING	m.c.r.

Raymond J. Duhamel REGISTERED PROFESSIONAL PLANNER R.P.P.

Date Issued:	APRIL 30, 2020
Checked By:	RD
Project No.:	PRA-19078
Drawn By:	m.c.r.
Drawing Name:	PRA-19078-HD-W-SP-1-rev9G.dwg

JONES CONSULTING GROUP LTD.
PLANNERS & ENGINEERS
229 Mapleview Drive East, Unit 1, Barrie, Ontario, L4N 0W5
Phone: 705-734-2538 Fax: 705-734-1056
www.jonesconsulting.com

PRATT HANSEN GROUP - BISTRO 6 WEST
CITY OF BARRIE

Project:	Bistro 6 West	Date:	Jan 2021	
File No.:	PRA-19078 (50)	Designed:	CG	
Subject:	Building A East - Fire Flow Calculations	Checked:	JI	
Revisions:				

Fire flow demands for the FUS method is based on information and guidance provided in Part 2 of the "Water Supply for Public Protection" (Fire Underwriters Survey, 1999)

An estimate of the fire flow required is given by the following formula:

$$F = 220C\sqrt{A}$$

where:

F = the required fire flow in litres per minute (Rounded to nearest 1000 L/min)

C = coefficient related to the type of construction

= 1.5 for wood frame construction (structure essentially all combustible).

= 1.0 for ordinary construction (brick or other masonry walls, combustible floor and interior)

= 0.8 for non-combustible construction (unprotected metal structural components, masonry or metal walls)

= 0.6 for fire-resistive construction (fully protected frame, floors, roof)

Note: For types of construction that do not fall within the categories given, coefficients shall not be grrater than 1.5 nor less than 0.6 and may be determined by interpolation between consecutive construction types as listed above

A = Total floor area in square meters (including all storeys, but excluding basements at least 50% below grade) in the building being considered.

Adjustments to the calculated fire flow can be made based on occupancy, sprinkler protection and exposure to other structures. The table below summarizes the adjustments made to the basic fire flow demand.

			(1)		(2)		(3)		(4)		**Final Adjustment**	
Building	GFA	C	Fire Flow "F"		Occupancy Contents		Sprinkler		Exposure		**Fire Flow**	
	(m^2)		(L/min)	(L/s)	(%)	Adjusted Fire Flow (L/min)	%	Adjustment (L/min)	%	Adjustment (L/min)	**(L/min)**	**(L/s)**
A East	3225.81	1.5	19,000	317	-15	16,150	-50	-8,075	10.00	1,615	**10,000**	**167**

Note: Based on Planning drawings prepared by The Jones Consulting Group Ltd., dated January 18, 2020.

(2) Occupancy Contents

Non-Combustible	-25%
Limited Combustible	-15%
Combustible	No Charge
Free Burning	15%
Rapid Burning	25%

(3) Sprinkler

30% credit for adequately designed system per NFPA 13. Additional 10% if water supply standard for both the system and fire department hose lines required. Additional credit of up to 10% given for a fully supervised system.

(4) Exposure

0 to 3m	25%	
3.1 to 10m	20%	Calculate for all sides.
10.1 to 20m	15%	Max charge shall not exceed
20.1 to 30m	10%	75%.
30.1 to 45m	5%	

Max charge percentage is outlined above. Max should only be used if exposed building meets all of the following conditions:

a) Same or poorer type of construction than fire building

b) Same or greater height than the fire building

c) Contains unprotected exposed openings

d) Unsprinklered

(each true condition accounts for 1/4 of the max charge percentage)

Calculations :

(1) Basic Required Fire Flow (F) = 317 L/s

(2) Building Occupancy Contents = -15 % Reduction

(3) Sprinkler System Credit = -50 % Reduction

(4) Exposure to building = 10.00 % Increase [See Calculation Below]

	Dist. (m)	Max Charge %	Adjusted Charge %	Notes:
North	>45	0	0.00	Exposure greater than 45m; No Charge Assigned
South	>45	0	0.00	Exposure greater than 45m; No Charge Assigned
East	>45	0	0.00	Exposure greater than 45m; No Charge Assigned
West	0.00	25	10.00	Fire wall seperating floors; Assign 10% Charge
		Total:	10.00	

Final Adjusted Fire Flow = Adjustment Flow from (2) + Sprinkler Adjustment (3) + Exposure Adjusment (4)

= **10000 L/min** or **167 L/s**

Project:	Bistro 6 West	Date:	Jan 2021	
File No.:	PRA-19078 (50)	Designed:	CG	
Subject:	Building A West - Fire Flow Calculations	Checked:	JI	
Revisions:				

Fire flow demands for the FUS method is based on information and guidance provided in Part 2 of the "Water Supply for Public Protection" (Fire Underwriters Survey, 1999)

An estimate of the fire flow required is given by the following formula:

$$F = 220C\sqrt{A}$$

where:

F = the required fire flow in litres per minute (Rounded to nearest 1000 L/min)

C = coefficient related to the type of construction

= 1.5 for wood frame construction (structure essentially all combustible).

= 1.0 for ordinary construction (brick or other masonry walls, combustible floor and interior)

= 0.8 for non-combustible construction (unprotected metal structural components, masonry or metal walls)

= 0.6 for fire-resistive construction (fully protected frame, floors, roof)

Note: For types of construction that do not fall within the categories given, coefficients shall not be grrater than 1.5 nor less than 0.6 and may be determined by interpolation between consecutive construction types as listed above

A = Total floor area in square meters (including all storeys, but excluding basements at least 50% below grade) in the building being considered.

Adjustments to the calculated fire flow can be made based on occupancy, sprinkler protection and exposure to other structures. The table below summarizes the adjustments made to the basic fire flow demand.

			(1)		(2)		(3)		(4)		**Final Adjustment**	
Building	GFA	C	Fire Flow "F"		Occupancy Contents		Sprinkler		Exposure		**Fire Flow**	
	(m^2)		(L/min)	(L/s)	(%)	Adjusted Fire Flow (L/min)	%	Adjustment (L/min)	%	Adjustment (L/min)	**(L/min)**	**(L/s)**
A West	6963.96	1.5	28,000	467	-15	23,800	-50	-11,900	13.75	3,273	**15,000**	**250**

Note: Based on Architectural drawings prepared by ISM Architects Inc., dated September 27, 2018.

(2) Occupancy Contents

Non-Combustible	-25%
Limited Combustible	-15%
Combustible	No Charge
Free Burning	15%
Rapid Burning	25%

(3) Sprinkler

30% credit for adequately designed system per NFPA 13. Additional 10% if water supply standard for both the system and fire department hose lines required. Additional credit of up to 10% given for a fully supervised system.

(4) Exposure

0 to 3m	25%	
3.1 to 10m	20%	Calculate for all sides.
10.1 to 20m	15%	Max charge shall not exceed
20.1 to 30m	10%	75%.
30.1 to 45m	5%	

Max charge percentage is outlined above. Max should only be used if exposed building meets all of the following conditions:

a) Same or poorer type of construction than fire building

b) Same or greater height than the fire building

c) Contains unprotected exposed openings

d) Unsprinklered

(each true condition accounts for 1/4 of the max charge percentage)

Calculations :

(1) Basic Required Fire Flow (F) = 467 L/s

(2) Building Occupancy Contents = -15 % Reduction

(3) Sprinkler System Credit = -50 % Reduction

(4) Exposure to building = 13.75 % Increase [See Calculation Below]

	Dist. (m)	Max Charge %	Adjusted Charge %	Notes:
North	>45	0	0.00	Exposure greater than 45m; No Charge Assigned
South	34.3	5	3.75	Conditions a), b), c) are True; Assign 3/4 of Max Charge
East	0	25	10.00	Fire wall seperating floors; Assign 10% Charge
West	>45	0	0.00	Exposure greater than 45m; No Charge Assigned
		Total:	13.75	

Final Adjusted Fire Flow = Adjustment Flow from (2) + Sprinkler Adjustment (3) + Exposure Adjusment (4)

= **15000 L/min** or **250 L/s**

Project:	Bistro 6 West	Date:	Jan 2021	
File No.:	PRA-19078 (50)	Designed:	CG	
Subject:	Building B North - Fire Flow Calculations	Checked:	JI	
Revisions:				

Fire flow demands for the FUS method is based on information and guidance provided in Part 2 of the "Water Supply for Public Protection" (Fire Underwriters Survey, 1999)

An estimate of the fire flow required is given by the following formula:

$$F = 220C\sqrt{A}$$

where:

F = the required fire flow in litres per minute (Rounded to nearest 1000 L/min)

C = coefficient related to the type of construction

= 1.5 for wood frame construction (structure essentially all combustible).

= 1.0 for ordinary construction (brick or other masonry walls, combustible floor and interior)

= 0.8 for non-combustible construction (unprotected metal structural components, masonry or metal walls)

= 0.6 for fire-resistive construction (fully protected frame, floors, roof)

Note: For types of construction that do not fall within the categories given, coefficients shall not be grrater than 1.5 nor less than 0.6 and may be determined by interpolation between consecutive construction types as listed above

A = Total floor area in square meters (including all storeys, but excluding basements at least 50% below grade) in the building being considered.

Adjustments to the calculated fire flow can be made based on occupancy, sprinkler protection and exposure to other structures. The table below summarizes the adjustments made to the basic fire flow demand.

			(1)		(2)		(3)		(4)		**Final Adjustment**	
Building	GFA	C	Fire Flow "F"		Occupancy Contents		Sprinkler		Exposure		**Fire Flow**	
	(m²)		(L/min)	(L/s)	(%)	Adjusted Fire Flow (L/min)	%	Adjustment (L/min)	%	Adjustment (L/min)	**(L/min)**	**(L/s)**
B North	7604.49	1.5	29,000	483	-15	24,650	-50	-12,325	13.75	3,389	**16,000**	**267**

Note: Based on Architectural drawings prepared by ISM Architects Inc., dated September 27, 2018.

(2) Occupancy Contents

Non-Combustible	-25%
Limited Combustible	-15%
Combustible	No Charge
Free Burning	15%
Rapid Burning	25%

(3) Sprinkler

30% credit for adequately designed system per NFPA 13. Additional 10% if water supply standard for both the system and fire department hose lines required. Additional credit of up to 10% given for a fully supervised system.

(4) Exposure

0 to 3m	25%	
3.1 to 10m	20%	Calculate for all sides.
10.1 to 20m	15%	Max charge shall not exceed
20.1 to 30m	10%	75%.
30.1 to 45m	5%	

Note: 10% exposure charge applied to adjacent floor area seperated by a fire wall or unpearced party wall.

Max charge percentage is outlined above. Max should only be used if exposed building meets all of the following conditions:

a) Same or poorer type of construction than fire building

b) Same or greater height than the fire building

c) Contains unprotected exposed openings

d) Unsprinklered

(each true condition accounts for 1/4 of the max charge percentage)

Calculations :

(1) Basic Required Fire Flow (F) = 483 L/s

(2) Building Occupancy Contents = -15 % Reduction

(3) Sprinkler System Credit = 41.23 -50 % Reduction

(4) Exposure to building = 13.75 % Increase [See Calculation Below]

		Max Charge	Adjusted Charge	
	31.41	%	%	Notes:
North	34.3	5	3.75	Condition a), b), c) is True; Assign 3/4 of Max Charge
South	0	25	10.00	Fire wall seperating floors; Assign 10% Charge
East	>45	0	0.00	Exposure greater than 45m; No Charge Assigned
West	>45	0	0.00	Exposure greater than 45m; No Charge Assigned
		Total:	13.75	

Final Adjusted Fire Flow = **Adjustment Flow from (2) + Sprinkler Adjustment (3) + Exposure Adjusment (4)**

= **16000 L/min** or **267 L/s**

Project:	Bistro 6 West	Date:	Jan 2021	
File No.:	PRA-19078 (50)	Designed:	CG	
Subject:	Building B South - Fire Flow Calculations	Checked:	JI	
Revisions:				

Fire flow demands for the FUS method is based on information and guidance provided in Part 2 of the "Water Supply for Public Protection" (Fire Underwriters Survey, 1999)

An estimate of the fire flow required is given by the following formula:

$$F = 220C\sqrt{A}$$

where:

F = the required fire flow in litres per minute (Rounded to nearest 1000 L/min)

C = coefficient related to the type of construction

= 1.5 for wood frame construction (structure essentially all combustible).

= 1.0 for ordinary construction (brick or other masonry walls, combustible floor and interior)

= 0.8 for non-combustible construction (unprotected metal structural components, masonry or metal walls)

= 0.6 for fire-resistive construction (fully protected frame, floors, roof)

Note: For types of construction that do not fall within the categories given, coefficients shall not be grrater than 1.5 nor less than 0.6 and may be determined by interpolation between consecutive construction types as listed above

A = Total floor area in square meters (including all storeys, but excluding basements at least 50% below grade) in the building being considered.

Adjustments to the calculated fire flow can be made based on occupancy, sprinkler protection and exposure to other structures. The table below summarizes the adjustments made to the basic fire flow demand.

			(1)		(2)		(3)		(4)		**Final Adjustment**	
Building	GFA	C	Fire Flow "F"		Occupancy Contents		Sprinkler		Exposure		**Fire Flow**	
	(m²)		(L/min)	(L/s)	(%)	Adjusted Fire Flow (L/min)	%	Adjustment (L/min)	%	Adjustment (L/min)	**(L/min)**	**(L/s)**
B South	8106.49	1.5	30,000	500	-15	25,500	-50	-12,750	13.75	3,506	**16,000**	**267**

Note: Based on Architectural drawings prepared by ISM Architects Inc., dated September 27, 2018.

(2) Occupancy Contents

Non-Combustible	-25%
Limited Combustible	-15%
Combustible	No Charge
Free Burning	15%
Rapid Burning	25%

(3) Sprinkler

30% credit for adequately designed system per NFPA 13. Additional 10% if water supply standard for both the system and fire department hose lines required. Additional credit of up to 10% given for a fully supervised system.

(4) Exposure

0 to 3m	25%	
3.1 to 10m	20%	Calculate for all sides.
10.1 to 20m	15%	Max charge shall not exceed
20.1 to 30m	10%	75%.
30.1 to 45m	5%	

Note: 10% Exposure charge applied to adjacent floor area separated by a fire wall or unpearced party wall.

Max charge percentage is outlined above. Max should only be used if exposed building meets all of the following conditions:

a) Same or poorer type of construction than fire building

b) Same or greater height than the fire building

c) Contains unprotected exposed openings

d) Unsprinklered

(each true condition accounts for 1/4 of the max charge percentage)

Calculations :

(1) Basic Required Fire Flow (F) = 500 L/s

(2) Building Occupancy Contents = -15 % Reduction

(3) Sprinkler System Credit = -50 % Reduction

(4) Exposure to building = 13.75 % Increase [See Calculation Below]

	Dist. (m)	Max Charge %	Adjusted Charge %	Notes:
North	0.0	25	10.00	Fire wall seperating floors; Assign 10% Charge
South	30.34	5	3.75	Conditions a), b), c) are True; Assign 3/4 of Max Charge
East	>45	0	0.00	Exposure greater than 45m; No Charge Assigned
West	>45	0	0.00	Exposure greater than 45m; No Charge Assigned
		Total:	13.75	

Final Adjusted Fire Flow = **Adjustment Flow from (2) + Sprinkler Adjustment (3) + Exposure Adjusment (4)**

= **16000 L/min** or **267 L/s**

Project:	Bistro 6 West	Date:	Jan 2021	
File No.:	PRA-19078 (50)	Designed:	CG	
Subject:	Building C East - Fire Flow Calculations	Checked:	JI	
Revisions:				

Fire flow demands for the FUS method is based on information and guidance provided in Part 2 of the "Water Supply for Public Protection" (Fire Underwriters Survey, 1999)

An estimate of the fire flow required is given by the following formula:

$$F = 220C\sqrt{A}$$

where:

F = the required fire flow in litres per minute (Rounded to nearest 1000 L/min)

C = coefficient related to the type of construction

= 1.5 for wood frame construction (structure essentially all combustible).

= 1.0 for ordinary construction (brick or other masonry walls, combustible floor and interior)

= 0.8 for non-combustible construction (unprotected metal structural components, masonry or metal walls)

= 0.6 for fire-resistive construction (fully protected frame, floors, roof)

Note: For types of construction that do not fall within the categories given, coefficients shall not be grrater than 1.5 nor less than 0.6 and may be determined by interpolation between consecutive construction types as listed above

A = Total floor area in square meters (including all storeys, but excluding basements at least 50% below grade) in the building being considered.

Adjustments to the calculated fire flow can be made based on occupancy, sprinkler protection and exposure to other structures. The table below summarizes the adjustments made to the basic fire flow demand.

			(1)		(2)		(3)		(4)		**Final Adjustment**	
Building	GFA	C	Fire Flow "F"		Occupancy Contents		Sprinkler		Exposure		**Fire Flow**	
	(m²)		(L/min)	(L/s)	(%)	Adjusted Fire Flow (L/min)	%	Adjustment (L/min)	%	Adjustment (L/min)	**(L/min)**	**(L/s)**
C East	3202.20	1.5	19,000	317	-15	16,150	-50	-8,075	25.00	4,038	**12,000**	**200**

Note: Based on Architectural drawings prepared by ISM Architects Inc., dated September 27, 2018.

(2) Occupancy Contents

Non-Combustible	-25%
Limited Combustible	-15%
Combustible	No Charge
Free Burning	15%
Rapid Burning	25%

(3) Sprinkler

30% credit for adequately designed system per NFPA 13. Additional 10% if water supply standard for both the system and fire department hose lines required. Additional credit of up to 10% given for a fully supervised system.

(4) Exposure

0 to 3m	25%	
3.1 to 10m	20%	Calculate for all sides.
10.1 to 20m	15%	Max charge shall not exceed
20.1 to 30m	10%	75%.
30.1 to 45m	5%	

Note: 10% Exposure charge applied to adjacent floor area separated by a fire wall or unpearced party wall.

Max charge percentage is outlined above. Max should only be used if exposed building meets all of the following conditions:

a) Same or poorer type of construction than fire building

b) Same or greater height than the fire building

c) Contains unprotected exposed openings

d) Unsprinklered

(each true condition accounts for 1/4 of the max charge percentage)

Calculations :

(1) Basic Required Fire Flow (F) = 317 L/s

(2) Building Occupancy Contents = -15 % Reduction

(3) Sprinkler System Credit = -50 % Reduction

(4) Exposure to building = 25.00 % Increase [See Calculation Below]

	Dist. (m)	Max Charge %	Adjusted Charge %	Notes:
North	>45	0	0.00	Exposure greater than 45m; No Charge Assigned
South	12.02	15	11.25	Conditions a), c), d) are True; Assign 3/4 of Max Charge
East	40.1	5	3.75	Conditions a), b), c) are True; Assign 3/4 of Max Charge
West	0.00	25	10.00	Fire wall seperating floors; Assign 10% Charge
		Total:	25.00	

Final Adjusted Fire Flow = Adjustment Flow from (2) + Sprinkler Adjustment (3) + Exposure Adjusment (4)

= **12000 L/min** or **200 L/s**

Project:	Bistro 6 West	Date:	Jan 2021	
File No.:	PRA-19078 (50)	Designed:	CG	
Subject:	Building C West - Fire Flow Calculations	Checked:	JI	
Revisions:				

Fire flow demands for the FUS method is based on information and guidance provided in Part 2 of the "Water Supply for Public Protection" (Fire Underwriters Survey, 1999)

An estimate of the fire flow required is given by the following formula:

$$F = 220C\sqrt{A}$$

where:

F = the required fire flow in litres per minute (Rounded to nearest 1000 L/min)

C = coefficient related to the type of construction

= 1.5 for wood frame construction (structure essentially all combustible).

= 1.0 for ordinary construction (brick or other masonry walls, combustible floor and interior)

= 0.8 for non-combustible construction (unprotected metal structural components, masonry or metal walls)

= 0.6 for fire-resistive construction (fully protected frame, floors, roof)

Note: For types of construction that do not fall within the categories given, coefficients shall not be grrater than 1.5 nor less than 0.6 and may be determined by interpolation between consecutive construction types as listed above

A = Total floor area in square meters (including all storeys, but excluding basements at least 50% below grade) in the building being considered.

Adjustments to the calculated fire flow can be made based on occupancy, sprinkler protection and exposure to other structures. The table below summarizes the adjustments made to the basic fire flow demand.

			(1)		(2)		(3)		(4)		**Final Adjustment**	
Building	GFA	C	Fire Flow "F"		Occupancy Contents		Sprinkler		Exposure		**Fire Flow**	
	(m²)		(L/min)	(L/s)	(%)	Adjusted Fire Flow (L/min)	%	Adjustment (L/min)	%	Adjustment (L/min)	**(L/min)**	**(L/s)**
C West	6696.13	1.5	27,000	450	-15	22,950	-50	-11,475	25.00	5,738	**17,000**	**283**

Note: Based on Architectural drawings prepared by ISM Architects Inc., dated September 27, 2018.

(2) Occupancy Contents

Non-Combustible	-25%
Limited Combustible	-15%
Combustible	No Charge
Free Burning	15%
Rapid Burning	25%

(3) Sprinkler

30% credit for adequately designed system per NFPA 13. Additional 10% if water supply standard for both the system and fire department hose lines required. Additional credit of up to 10% given for a fully supervised system.

(4) Exposure

0 to 3m	25%	
3.1 to 10m	20%	Calculate for all sides.
10.1 to 20m	15%	Max charge shall not exceed
20.1 to 30m	10%	75%.
30.1 to 45m	5%	

Note: 10% Exposure charge applied to adjacent floor area separated by a fire wall or unpearced party wall.

Max charge percentage is outlined above. Max should only be used if exposed building meets all of the following conditions:

a) Same or poorer type of construction than fire building

b) Same or greater height than the fire building

c) Contains unprotected exposed openings

d) Unsprinklered

(each true condition accounts for 1/4 of the max charge percentage)

Calculations :

(1) Basic Required Fire Flow (F) = 450 L/s

(2) Building Occupancy Contents = -15 % Reduction

(3) Sprinkler System Credit = -50 % Reduction

(4) Exposure to building = 25.00 % Increase [See Calculation Below]

	Dist. (m)	Max Charge %	Adjusted Charge %	Notes:
North	30.3	5	3.75	Condition a), b), c) is True; Assign 3/4 of Max Charge
South	12.02	15	11.25	Conditions a), c), d) are True; Assign 3/4 of Max Charge
East	0.00	25	10.00	Fire wall seperating floors; Assign 10% Charge
West	>45	0	0.00	Exposure greater than 45m; No Charge Assigned
		Total:	25.00	

Final Adjusted Fire Flow = **Adjustment Flow from (2) + Sprinkler Adjustment (3) + Exposure Adjusment (4)**

= **17000 L/min** or **283 L/s**

Water Supply Demand Calculation and Water Age Analysis

Bistro 6 West (Block 598)

City of Barrie

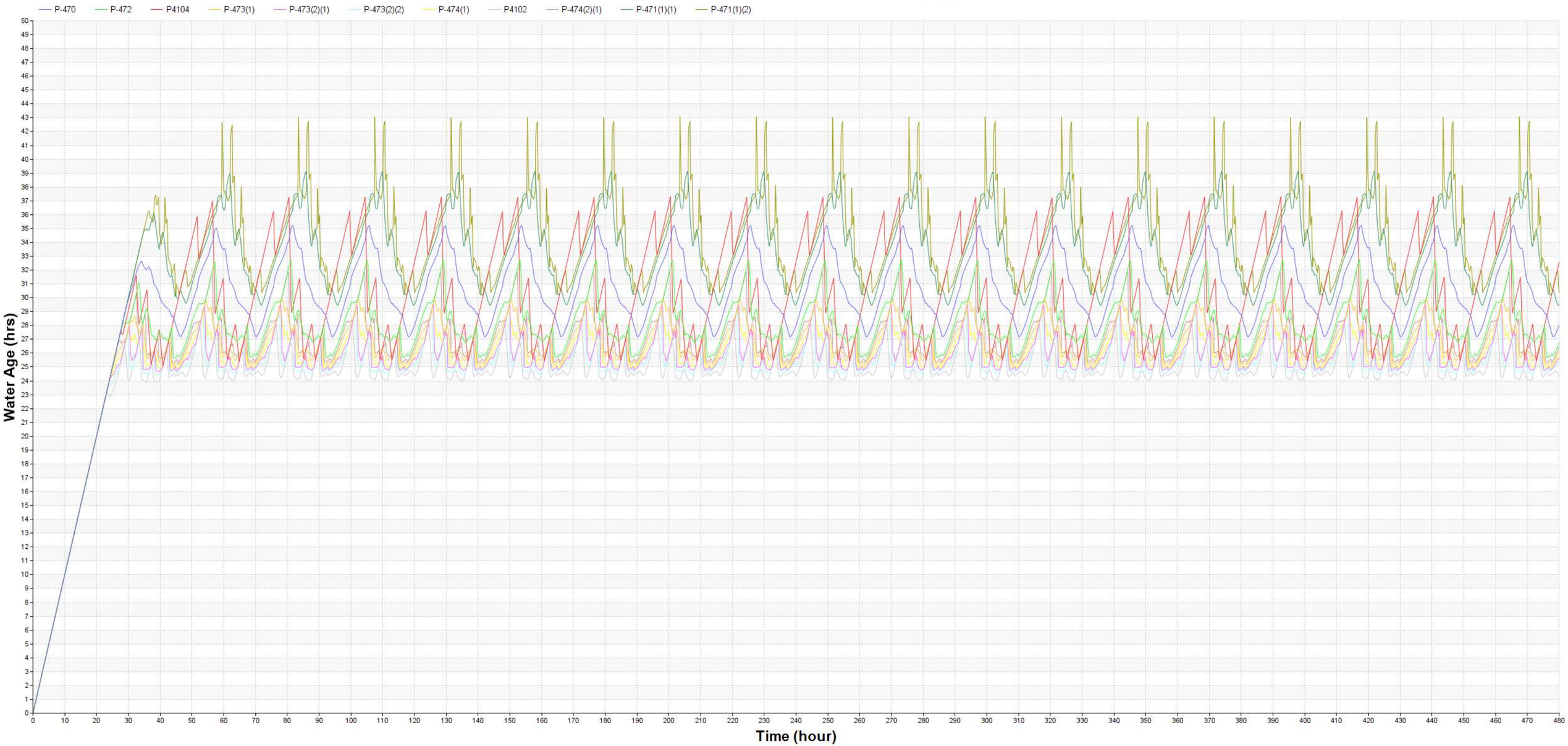
February 2021

Demands			
Average daily demand		225	L/cap/day
Minimum hour factor		0.4	
Maximum day factor		2.75	
Peak hour factor		4.13	
Population Densities			
Total population		583	
Persons per unit	Apartments:	1.67	persons per unit

Node	Elevation (m)	Residential	Population	Demand			
		App. Units	Residential	Average Day (l/s)	Maximum Day (l/s)	Peak Hour (l/s)	Minimum Hour (l/s)
B6-1	259.15	96	161	0.42	1.15	1.73	0.17
B6-7	259.2	156	261	0.68	1.87	2.81	0.27
B7-12	260.61	96	161	0.42	1.15	1.73	0.17

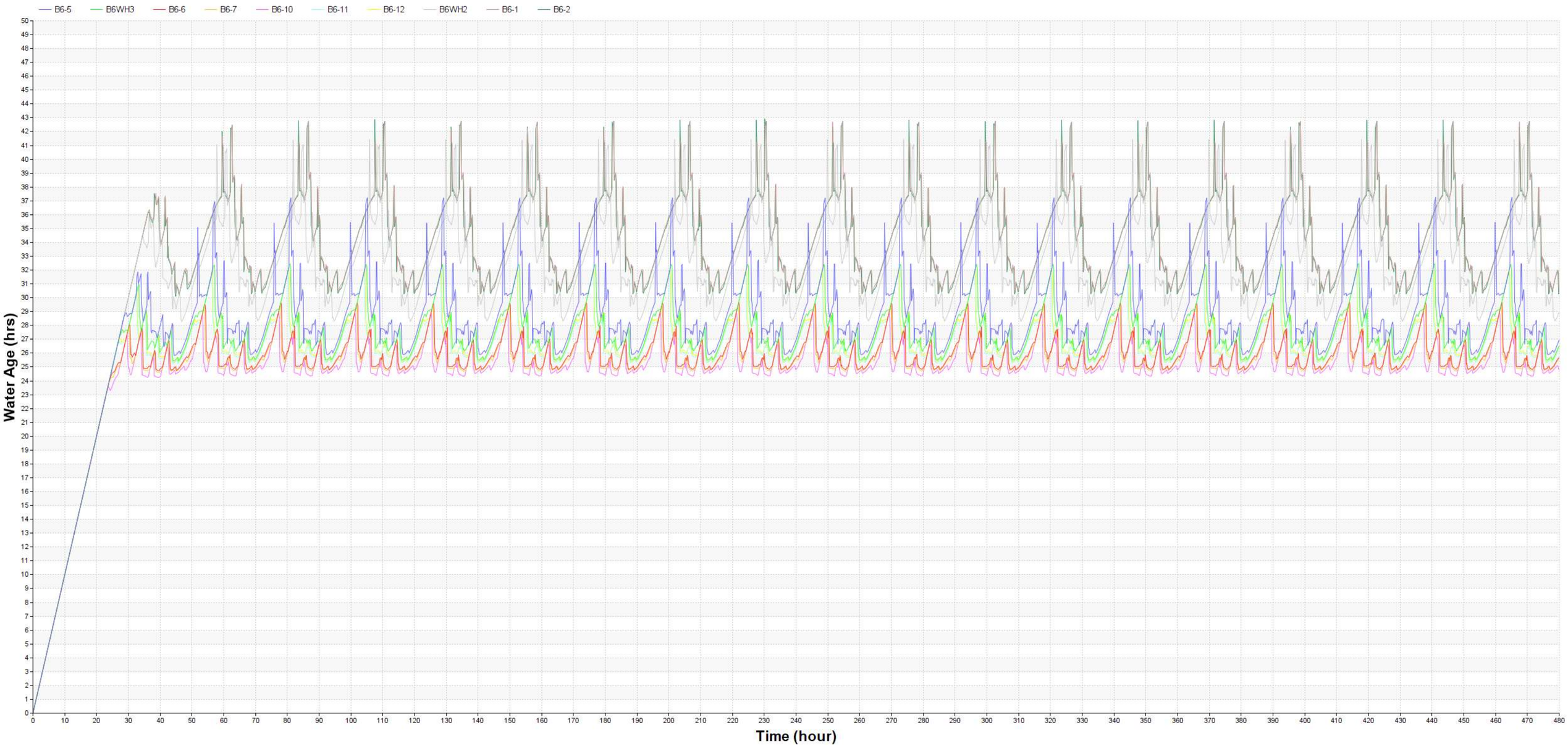
		ID	Max.Value (hrs)	Max.Time (hrs.)	Min.Value (hrs)	Min.Time (hrs.)	Average (hrs)	Difference (hrs)
1	☐	P-470	35.24	465:40	0.00	00:00	29.84	35.24
2	☐	P-472	32.76	417:10	0.00	00:00	27.36	32.76
3	☐	P4104	37.30	200:30	0.00	00:00	29.81	37.30
4	☐	P-473(1)	29.96	414:20	0.00	00:00	26.13	29.96
5	☐	P-473(2)(1)	29.56	437:50	0.00	00:00	25.24	29.56
6	☐	P-473(2)(2)	29.05	437:20	0.00	00:00	24.96	29.05
7	☐	P-474(1)	29.18	437:30	0.00	00:00	25.57	29.18
8	☐	P4102	28.12	412:30	0.00	00:00	24.41	28.12
9	☐	P-474(2)(1)	31.90	416:20	0.00	00:00	26.50	31.90
10	☐	P-471(1)(1)	39.14	421:50	0.00	00:00	32.35	39.14
11	☐	P-471(1)(2)	43.07	203:30	0.00	00:00	33.20	43.07

Pipe P-470,P-472,...,P-471(1)(2)

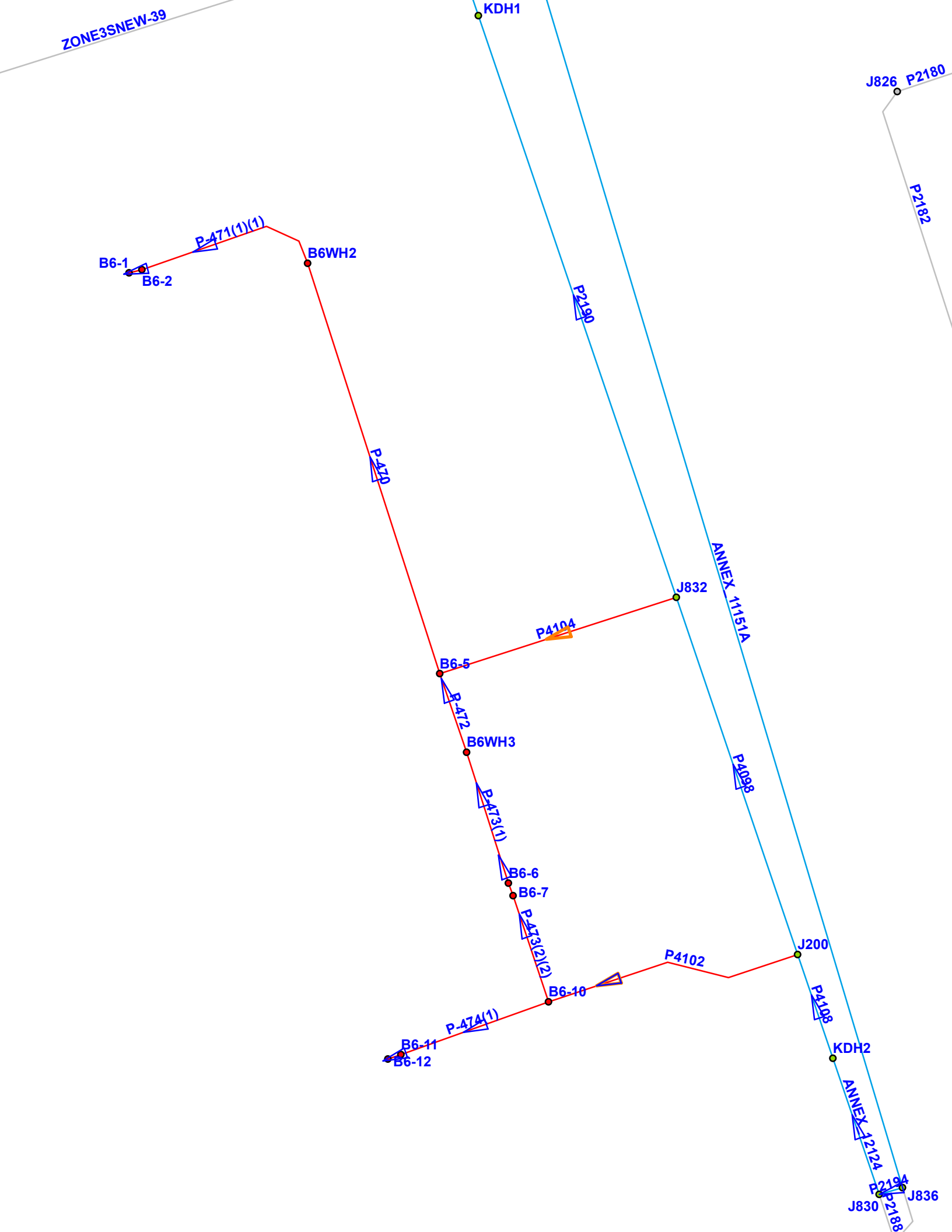


		ID	Max.Value (hrs)	Max.Time (hrs.)	Min.Value (hrs)	Min.Time (hrs.)	Average (hrs)	Difference (hrs)
1	☐	B6-5	37.25	465:10	0.00	00:00	28.00	37.25
2	☐	B6WH3	32.46	416:50	0.00	00:00	26.94	32.46
3	☐	B6-6	29.67	414:00	0.00	00:00	25.31	29.67
4	☐	B6-7	29.51	413:50	0.00	00:00	25.17	29.51
5	☐	B6-10	28.91	437:10	0.00	00:00	24.77	28.91
6	☐	B6-11	31.85	416:10	0.00	00:00	26.43	31.85
7	☐	B6-12	32.05	416:20	0.00	00:00	26.56	32.05
8	☐	B6WH2	41.43	297:50	0.00	00:00	31.58	41.43
9	☐	B6-1	42.75	470:40	0.00	00:00	33.26	42.75
10	☐	B6-2	42.94	230:10	0.00	00:00	33.13	42.94

Junction B6-5,B6WH3,...,B6-2



InfoWater Model and Results


ZONE3SNEW-39
KDH1
J826
P2180
P2182
P2190
ANNEX_11151A
B6-1
P-471(1)(1)
B6-2
B6WH2
P-470
J832
P4104
B6-5
P-472
B6WH3
P4098
P-473(1)
B6-6
B6-7
P-473(2)(2)
J200
P4102
B6-10
P4108
P-474(1)
B6-11
B6-12
KDH2
ANNEX_12124
P2194
J836
J830
P2188

		ID	Max.Value (L/s)	Max.Time (hrs.)	Min.Value (L/s)	Min.Time (hrs.)	Average (L/s)	Difference (L/s)
1	☐	B6-5	0.00	00:00	0.00	00:00	0.00	0.00
2	☐	B6WH3	0.00	00:00	0.00	00:00	0.00	0.00
3	☐	B6-6	0.00	00:00	0.00	00:00	0.00	0.00
4	☐	B6-7	1.35	20:00	0.23	01:00	0.69	1.12
5	☐	B6-10	0.00	00:00	0.00	00:00	0.00	0.00
6	☐	B6-11	0.00	00:00	0.00	00:00	0.00	0.00
7	☐	B6-12	0.83	20:00	0.14	01:00	0.43	0.69
8	☐	B6WH2	0.00	00:00	0.00	00:00	0.00	0.00
9	☐	B6-1	0.83	20:00	0.14	01:00	0.43	0.69
10	☐	B6-2	0.00	00:00	0.00	00:00	0.00	0.00

		ID	Max.Value (m)	Max.Time (hrs.)	Min.Value (m)	Min.Time (hrs.)	Average (m)	Difference (m)
1	☐	B6-5	311.19	02:00	306.65	09:00	308.06	4.54
2	☐	B6WH3	311.19	02:00	306.65	09:00	308.06	4.54
3	☐	B6-6	311.19	02:00	306.65	09:00	308.06	4.54
4	☐	B6-7	311.19	02:00	306.65	09:00	308.06	4.54
5	☐	B6-10	311.19	02:00	306.65	09:00	308.06	4.54
6	☐	B6-11	311.19	02:00	306.65	09:00	308.06	4.54
7	☐	B6-12	311.19	02:00	306.65	09:00	308.06	4.54
8	☐	B6WH2	311.19	02:00	306.65	09:00	308.06	4.54
9	☐	B6-1	311.19	02:00	306.65	09:00	308.06	4.54
10	☐	B6-2	311.19	02:00	306.65	09:00	308.06	4.54

Bistro 6 West Site - Pressure

		ID	Max.Value (kPa)	Max.Time (hrs.)	Min.Value (kPa)	Min.Time (hrs.)	Average (kPa)	Difference (kPa)
1	☐	B6-5	525.59	02:00	481.10	09:00	494.93	44.48
2	☐	B6WH3	519.80	02:00	475.32	09:00	489.15	44.48
3	☐	B6-6	509.42	02:00	464.93	09:00	478.76	44.48
4	☐	B6-7	509.42	02:00	464.93	09:00	478.76	44.48
5	☐	B6-10	503.34	02:00	458.86	09:00	472.69	44.48
6	☐	B6-11	495.60	02:00	451.12	09:00	464.94	44.48
7	☐	B6-12	495.60	02:00	451.12	09:00	464.94	44.48
8	☐	B6WH2	513.24	02:00	468.75	09:00	482.58	44.49
9	☐	B6-1	509.91	02:00	465.42	09:00	479.25	44.49
10	☐	B6-2	509.91	02:00	465.42	09:00	479.25	44.49

		ID	Max.Value (L/s)	Max.Time (hrs.)	Min.Value (L/s)	Min.Time (hrs.)	Average (L/s)	Difference (L/s)
1	☐	P-470	0.83	20:00	0.14	169:00	0.43	0.69
2	☐	P-472	0.83	20:00	0.14	172:00	0.38	0.69
3	☐	P4104	0.24	281:00	0.00	00:00	0.05	0.24
4	☐	P-473(1)	0.83	20:00	0.14	172:00	0.38	0.69
5	☐	P-473(2)(1)	0.83	20:00	0.14	172:00	0.38	0.69
6	☐	P-473(2)(2)	2.18	20:00	0.37	49:00	1.07	1.80
7	☐	P-474(1)	0.83	20:00	0.14	241:00	0.43	0.69
8	☐	P4102	3.01	20:00	0.52	265:00	1.50	2.49
9	☐	P-474(2)(1)	0.83	20:00	0.14	241:00	0.43	0.69
10	☐	P-471(1)(1)	0.83	20:00	0.14	169:00	0.43	0.69
11	☐	P-471(1)(2)	0.83	20:00	0.14	49:00	0.43	0.69

Bistro 6 West - Headloss

		ID	Max.Value (m)	Max.Time (hrs.)	Min.Value (m)	Min.Time (hrs.)	Average (m)	Difference (m)
1	☐	P-470	0.00	20:00	0.00	00:00	0.00	0.00
2	☐	P-472	0.00	01:00	0.00	00:00	0.00	0.00
3	☐	P4104	0.00	137:00	0.00	00:00	0.00	0.00
4	☐	P-473(1)	0.00	20:00	0.00	01:00	0.00	0.00
5	☐	P-473(2)(1)	0.00	31:00	0.00	00:00	0.00	0.00
6	☐	P-473(2)(2)	0.00	44:00	0.00	00:00	0.00	0.00
7	☐	P-474(1)	0.00	21:00	0.00	00:00	0.00	0.00
8	☐	P4102	0.00	20:00	0.00	01:00	0.00	0.00
9	☐	P-474(2)(1)	0.00	13:00	0.00	00:00	0.00	0.00
10	☐	P-471(1)(1)	0.00	68:00	0.00	00:00	0.00	0.00
11	☐	P-471(1)(2)	0.00	35:00	0.00	00:00	0.00	0.00

Bistro 6 West - Headloss/1km

		ID	Max.Value (m/k-m)	Max.Time (hrs.)	Min.Value (m/k-m)	Min.Time (hrs.)	Average (m/k-m)	Difference (m/k-m)
1	☐	P-470	0.00	20:00	0.00	00:00	0.00	0.00
2	☐	P-472	0.00	01:00	0.00	00:00	0.00	0.00
3	☐	P4104	0.00	137:00	0.00	00:00	0.00	0.00
4	☐	P-473(1)	0.00	20:00	0.00	01:00	0.00	0.00
5	☐	P-473(2)(1)	0.01	31:00	0.00	00:00	0.00	0.01
6	☐	P-473(2)(2)	0.01	44:00	0.00	00:00	0.00	0.01
7	☐	P-474(1)	0.00	21:00	0.00	00:00	0.00	0.00
8	☐	P4102	0.01	20:00	0.00	01:00	0.00	0.01
9	☐	P-474(2)(1)	0.01	13:00	0.00	00:00	0.00	0.01
10	☐	P-471(1)(1)	0.00	68:00	0.00	00:00	0.00	0.00
11	☐	P-471(1)(2)	0.01	35:00	0.00	00:00	0.00	0.01

		ID	Max.Value (m/s)	Max.Time (hrs.)	Min.Value (m/s)	Min.Time (hrs.)	Average (m/s)	Difference (m/s)
1	☐	P-470	0.01	20:00	0.00	169:00	0.01	0.01
2	☐	P-472	0.01	20:00	0.00	172:00	0.01	0.01
3	☐	P4104	0.01	281:00	0.00	00:00	0.00	0.01
4	☐	P-473(1)	0.01	20:00	0.00	172:00	0.01	0.01
5	☐	P-473(2)(1)	0.01	20:00	0.00	172:00	0.01	0.01
6	☐	P-473(2)(2)	0.03	20:00	0.01	49:00	0.02	0.03
7	☐	P-474(1)	0.01	20:00	0.00	241:00	0.01	0.01
8	☐	P4102	0.04	20:00	0.01	265:00	0.02	0.04
9	☐	P-474(2)(1)	0.01	20:00	0.00	241:00	0.01	0.01
10	☐	P-471(1)(1)	0.01	20:00	0.00	169:00	0.01	0.01
11	☐	P-471(1)(2)	0.01	20:00	0.00	49:00	0.01	0.01

Bistro 6 West - Max Day Demand + Fire Flow

		ID	Static Demand (L/s)	Static Pressure (kPa)	Static Head (m)	Fire-Flow Demand (L/s)	Residual Pressure (kPa)	Hydrant Available Flow (L/s)	Hydrant Pressure at Available Flow (kPa)	Critical Pipe ID at Available Flow	Critical Pipe Velocity at Available Flow
1	☐	B6WH3	0.00	459.95	305.08	267.00	391.17	425.14	298.59	P-473(1)	5.00
2	☐	B6-7	1.87	449.56	305.08	267.00	389.25	413.27	316.50	P-473(2)(2)	5.01
3	☐	B6WH2	0.00	453.38	305.08	267.00	340.20	352.56	264.85	P-470	5.00
4	☐	B6-1	1.15	450.05	305.08	250.00	332.85	353.43	230.08	P-471(1)(2)	5.00
5	☐	B6-12	1.15	435.75	305.08	283.00	358.71	353.44	320.69	P-474(2)(1)	5.00
6	☐	KDH1	0.00	496.54	305.08	167.00	478.45	621.82	296.72	P4106	5.01
7	☐	KDH2	0.00	457.13	305.08	200.00	438.49	489.92	361.39	ANNEX_12124	5.03