MERITECH

May 3, 2019

50 Shade St Investments Inc.
425 Alness Street
Toronto, ON M3J 2T8

Attention: Mr. Morteza Alabaf
Director, Planning & Development

Dear Mr. Alabaf,

Re: Servicing Letter
55 Kerr Street
City of Cambridge

The 1.01-hectare site is located at the southwest corner of Shade Street and Kerr Street near downtown Galt, as shown in figure 1 below. The currently vacant site drains west towards Mill Creek and has been historically used for industrial purposes. The proposed redevelopment includes two multi-storey apartments with a combined total of 602 units, with surface and underground parking.

Pre-submission consultation comments from a meeting held April 26, 2018 form the basis of our understanding of agency requirements for sanitary, water, and storm servicing for the developed site. This letter is intended to present the proposed approach to servicing in support of various planning applications (Official Plan, Zoning Amendment) that are being advanced concurrently with Site Plan Approval.

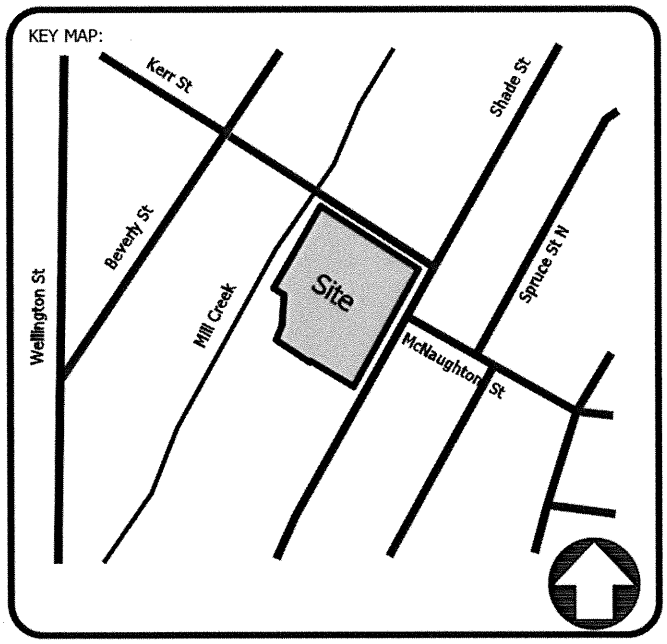

Figure 1: Site Location

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Sanitary Servicing

The primary objective with respect to sanitary servicing is that a sanitary sewer system servicing the site can be constructed as per Provincial, Regional and City standards.

The current proposal is for 602 units in two buildings. As shown on the attached sanitary design spreadsheet, this corresponds to a peak flow of 14.2L/s. The design flow for the site was calculated using the 602 units proposed, rather than the zoning density of 250 units/hectare for the proposed RM1 zoning. A 'people per unit' (ppu) value of 1.77 was used for the apartment units, as provided by the Region. A 150mm diameter service at 2% slope will be sufficient to convey this flow.

There is currently a 1050mm diameter trunk sanitary sewer in Shade Street. The flow from the site of 14.2L/s represents less than 1% of the capacity of this trunk sewer. Pre-submission comments from the City state that the City has confirmed that there is sufficient downstream reserve capacity.

Three existing services of unknown size and condition that connect to the Shade Street sewer are located south of McNaughton Street. These services will be located and excavated to determine their suitability for re-use as the sanitary service for this development. If the services are unsuitable, it is proposed to outlet to the existing at the intersection of Shade Street and McNaughton Street with a new service.

Water Servicing

There are two objectives regarding water servicing: provide domestic water supply as per Provincial, Regional, and City requirements, and ensure that an adequate firefighting water supply is available as per Ontario Building Code and other Regional requirements.

There is an existing hydrant located at the northeast corner of Shade Street and McNaughton Street, as well as a hydrant on the south side of Kerr Street, at the northwest corner of the site. An additional private hydrant is required to be installed in the center of the site to provide adequate coverage to the fire department connections of the buildings, which will both be sprinklered.

An existing 200mm diameter main exists on both Kerr Street and Shade Street. An existing 200mm diameter water service from Shade Street is proposed to be re-used to service the site. The mechanical engineer or sprinkler system designer will confirm that the 200mm service is sufficient, in support of building permit. The Region of Waterloo has provided modeling simulation results for the site (attached), which show that over 400 L/s is available to the site in a firefighting scenario.

Storm Servicing

The primary objective with respect to storm servicing is that a storm sewer system servicing the site can be constructed as per Provincial, Regional and City standards. The development will outlet into Mill Creek and runoff will be required to be controlled such that post-development peak flow rates match pre-development peak flow rates.

The proposed storm servicing consists of rooftop storage combined with controlled flow roof drains, area drains on the surface parking (which is all directly above the parking garage below), storm sewers/plumbing within the parking garage, an oil-grit separator, and an underground storage tank. The system will discharge to Mill Creek to the west.

Stormwater Management

Stormwater quality and quantity control are proposed as part of the stormwater management plan for this site. Refer to the Stormwater Management Report. Quality control will be provided to the 'Enhanced' level of control in the form of a Hydroguard HS5 oil-grit separator. Quantity control is required to attenuate the 5-year and 100-year post-development peak flows to pre-development rates. An orifice plate and underground storage tank will be used as retention devices to store excess runoff prior to discharge to Mill Creek at less than or equal to pre-development rates.

Utilities

The following utility companies have been contacted to confirm their ability to service the development:

- Energy+
- Bell Canada
- Rogers Cable
- Union Gas

Grading and Drainage

The existing site slopes from the east to west, towards Mill Creek. The proposed grading of the parking lot will convey drainage to the internal storm system. Grading around the perimeter of the site (between the buildings and the streets) will be towards the rights-of-way. A portion of the driveway access at Kerr Street is proposed to drain uncontrolled to the right-of-way to direct the Regulatory Storm's flow path to Kerr Street, rather than through the site.

Recommendations

A sanitary service should connect to the manhole at the intersection of Shade Street and McNaughton Street, only if an existing service along Shade Street is not found suitable for re-use.

The sprinkler system designer should confirm adequacy of the 200mm water service.

Post-development peak flows should be attenuated to pre-development peak flow rates.

Agencies shall review and approve this document as a suitable approach to a proposed design configuration and Official Plan, re-zoning, and Site Plan approval.

Yours very truly,

MERITECH ENGINEERING

Christopher H. Togeretz, P.Eng.
Manager, Design Services

FMB/sb

Enclosures: (3)

cc

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Sanitary Sewer Design Sheet

Project: 55 Kerr Street
File: 3335
Calc'd by: FMB
Date: 10-Apr-19
Chk'd by: CHT
Date: 24-Apr-19

for

The City of Cambridge

Ref#

Pipe Velocities: 0.60 m/s min. (pipe full)
3.00 m/s max. (actual flow)
n= 0.013 all pipe material

Residential average daily flow (q): 300 L/cap/d 2014 Sanitary Sewer Master Plan

Unit extraneous flow (E): 0.2 L/s/ha 2014 Sanitary Sewer Master Plan

q = average daily per capita flow (L/cap/d)
I = Unit of peak extraneous flow (L/s/ha)
Q(p) = peak population flow (L/s)
Q(I) = peak extraneous flow (L/s)
Q(d) = peak design flow (L/s)

Peaking Factor:
M = 1 + 14/(4+(P/1000)^0.5)
Q(p) = (P/1000)qM/86.4 (L/s)
Q(I) = IA (L/s) ; where A = Area in hectares
Q(d) = Q(p) + Q(I) (L/s)

Manning Equation:
Qcap. = (D/1000)^2.667*(S/100)^0.5/(3.211*n)*1000 (L/s)
D: pipe size (mm)
S: slope (grade) of pipe (%)
n: roughness coeffiecient

Location		Unit Count (ppu)	Residential 0.0035 (L/s/cap)						Infiltration 0.2				Pipe							
		1.77	Individual		Accumulative		Peak	Pop.	Total	Accum	Extran.	Design	Length	Size	Pipe	Slope	Capacity	Velocity		Actual
From	To	Apt	P (person)	Area (ha)	P (person)	Area (ha)	Factor M	Q(p) (L/s)	Area	Total Area	Q(I) (L/s)	Q(d) (L/s)	L (m)	D (mm)	Mat'l	S (%)	Qcap. (L/s)	V (m/s)	Q(d)/Qcap	Velocity (m/s)
Site																				
Bldg	Shade St	602	1066	1.01	1066	1.01	3.782	13.998	1.010	1.010	0.202	14.200	10.0	150	PVC	2.00%	22.472	1.232	63.2%	1.312
Existing trunk					1066	1.01	3.782	13.998		1.010	0.202	14.200	75.2	1050	Concrete	0.28%	1507.636	1.686	0.9%	0.017

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Storm Sewer Hydraulic Design Sheet

Project: 55 Kerr Street
File: 3335
Calc'd by: FMB
Date: 5-Mar-19
Chk'd by: CHT
Date: 23-Apr-19

for

The City of Cambridge

Ref #

I=A/(Tc+B)^C
A= 1219.8
B= 10.5
C= 0.823
Tc= 10

Pipe Velocities: 0.8 m/s min.
6.0 m/s max.
n= 0.024 CSP
n= 0.013 Conc./PVC/HDPE

5 Year Design Storm

Rational Formula: Q =CIA/0.36
Where: Q : peak flow (L/s)
C : runoff coefficient
I : rainfall intensity (mm/hr)
A : area (ha)

Concentration time: tc = ti + tf (minute)
Where: ti: inlet time before pipe (minute)
tf: time of flow in pipe (minute)
tf = L/60V
ti = 10

Manning Equation:
Qcap.=(D/1000)^2.667*(S/100)^0.5/(3.211*n)*1000 (L/s)
D: pipe size (mm)
S: slope (grade) of pipe (%)
n: roughness coeffiecient

Location		Runoff									Pipe								
From	To	Area ID	Area A (ha)	"C"	Section "AC" (ha)	Accum. "AC" (ha)	ti (Min.)	tc (Min.)	"I" (mm/hr)	Peak Flow Q (L/s)	Length L (m)	N.D. D (mm)	Pipe Mat'l	Slope S (%)	Qcap. (full) (L/s)	V (full) (m/s)	tf (Min.)	Q/Qcap.	Actual Velocity (m/s)
Site																			
1	2	1	0.06	1.00	0.060	0.060	10.00	10.37	101.558	16.926	26.6	250	PVC	1.00%	59.468	1.211	0.37	28%	1.030
2	5	2	0.06	1.00	0.060	0.120	10.37	10.68	100.090	33.363	22.8	250	PVC	1.00%	59.468	1.211	0.31	56%	1.248
2	5	3	0.01	1.00	0.010	0.010	10.00	10.43	101.558	2.821	26.9	200	PVC	1.00%	32.798	1.044	0.43	9%	0.606
4	5	4	0.09	1.00	0.090	0.100	10.43	10.92	99.840	27.733	35.4	250	PVC	1.00%	59.468	1.211	0.49	47%	1.187
2	5					0.120		10.68											
3	5					0.100		10.92											
5	OGS	5	0.08	1.00	0.080	0.300	10.92	11.10	97.968	81.640	15.1	300	PVC	1.00%	96.701	1.368	0.18	84%	1.546
OGS	Tank					0.300	11.10	11.13	97.281	81.067	2.8	300	PVC	1.00%	96.701	1.368	0.03	84%	1.539
Tank	Creek				*Outlet is flow-controlled to a maximum flow of*					41.000	10.7	300	PVC	1.00%	96.701	1.368	0.13	42%	1.300

Region of Waterloo

TRANSPORTATION AND
ENVIRONMENTAL SERVICES
Water Services

150 Frederick Street
Kitchener ON Canada N2G 4J3
Telephone: (519) 575-4426
Fax: (519) 575-4452
www.region.waterloo.on.ca

Date: January 8, 2019
File #: E18-10/CA

Christopher Togeretz, P. Eng.
Meritech Engineering
1315 Bishop St N, Suite 202
Cambridge, ON N1R 6Z2
t. 519.623.1140 ext 214
e. christophert@meritech.ca

Dear: Chris

Re: 50 & 55 Kerr St., Cambridge

Please find the results of the modeling simulations for boundary conditions originally requested on July 6, 2018 by Steve Buckley. The results included a figure showing the locations of the nodes from the Region's model. Attached are a series of spreadsheets containing results for Average Day, Maximum Day demands and available fire flows for nodes JCT_14978 located at the intersection of Kerr St and Shade St. The subject site is located in the Cambridge Zone 1 pressure zone, with a current HGL of approximately 331 mASL. All results are based on this existing HGL.

Please be advised Cambridge Zone 1 pressure zone will be undergoing adjustments to the HGL. As such, the applicant should account and design for the future expected hydraulic grade line of 323.5 mASL for the ultimate design of the site. The anticipated timeline for the HGL adjustment is by end of 2023.

The diurnal 24 hour demand distribution accounts for the minimum hour and peak hour peaking factors. The minimum hourly demand on the average day represents the minimum hour, and the maximum hourly demand on the maximum day represents the peak hour. No additional Demands were applied to nodes.

. Table 1 below summarizes the modeling results.

Table 1 – Modeling Results

Node	**Elevation** (mASL)	**Demand**		**Fire Flow Results**	
		Ave Day (L/s)	Max Day (L/s)	Design Flow (L/s)	Design Pressure (m)
JCT_14978	277.0	3.58	5.01	422.8	14.0

A fire flow analysis shows the maximum flow available at a node with an associated design pressure during the maximum day scenario while maintaining the minimum design pressure of 14 m (140 kPa) at all nodes within the pressure zone.

A previous modelling request was requested in June 2015. The result from that modelling request was based on a model that did not include all the pipes as was completed today. Fire flows in 2015 returned an available flow of 276.6 L/s at a node at Shade St at McNaughton St. This will explain why we are seeing an improvement in the available fireflows in today's results.

As discussed with you on Jan 7, 2019 with John Holowackyj, the location map includes the current phase 2 LRT alignment which is proposed to run adjacent to your property. The Region's Planning Dept may require the services to be ***not located*** on Kerr St. Final alignment will be confirmed at the design and construction phase of stage 2.

If you have any questions, please contact me.

Kevin Dolishny P.Eng.
Senior Project Engineer, Servicing and Development Planning
t. 519.575.4757 x 3862
e-mail: kdolishny@regionofwaterloo.ca

cc Steve Buckley, Meritech
John Holowackyj - Region of Waterloo
Jason Wigglesworth – Region of Waterloo

CAM 1 Infowater

JCT_14978 Average Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	2.11	331.47	54.47
01:00 hrs	1.75	332.29	55.29
02:00 hrs	2.18	332.83	55.83
03:00 hrs	2.29	333.67	56.67
04:00 hrs	2.11	333.53	56.53
05:00 hrs	2.00	334.32	57.32
06:00 hrs	2.80	334.56	57.56
07:00 hrs	4.04	330.59	53.59
08:00 hrs	4.62	329.53	52.53
09:00 hrs	4.33	330.76	53.76
10:00 hrs	4.48	330.90	53.90
11:00 hrs	4.48	329.73	52.73
12:00 hrs	4.22	329.26	52.26
13:00 hrs	4.08	329.28	52.28
14:00 hrs	3.78	329.94	52.94
15:00 hrs	3.71	330.39	53.39
16:00 hrs	3.97	330.43	53.43
17:00 hrs	4.19	330.72	53.72
18:00 hrs	4.66	330.46	53.46
19:00 hrs	4.99	329.71	52.71
20:00 hrs	5.06	329.19	52.19
21:00 hrs	4.59	328.89	51.89
22:00 hrs	3.97	329.06	52.06
23:00 hrs	2.98	330.34	53.34

Average Day HGL:	330.91
Minimum Hour:	334.56

JCT_14978 Maximum Day 24 Hour Simulation

Time	Demand (L/s)	Head (m)	Pressure (m)
00:00 hrs	2.55	327.04	50.04
01:00 hrs	1.73	328.06	51.06
02:00 hrs	2.19	329.29	52.29
03:00 hrs	2.96	329.49	52.49
04:00 hrs	2.75	330.06	53.06
05:00 hrs	2.96	330.22	53.22
06:00 hrs	4.49	329.59	52.59
07:00 hrs	6.89	328.35	51.35
08:00 hrs	6.99	326.60	49.60
09:00 hrs	5.56	326.20	49.20
10:00 hrs	5.10	326.03	49.03
11:00 hrs	5.20	325.97	48.97
12:00 hrs	5.05	325.93	48.93
13:00 hrs	5.05	325.69	48.69
14:00 hrs	4.64	325.75	48.75
15:00 hrs	4.39	326.92	49.92
16:00 hrs	5.15	326.80	49.80
17:00 hrs	5.82	326.19	49.19
18:00 hrs	6.53	324.93	47.93
19:00 hrs	7.65	324.22	47.22
20:00 hrs	8.57	323.64	46.64
21:00 hrs	8.93	323.26	46.26
22:00 hrs	6.99	323.39	46.39
23:00 hrs	4.29	324.41	47.41

Maximum Day HGL:	326.58
Peak Hour:	323.26

JCT_14978	Residual Pressure (m)
0.0	49.0
20.0	48.6
40.0	48.1
60.0	47.5
80.0	46.7
100.0	45.8
120.0	44.8
140.0	43.6
160.0	42.3
180.0	41.0
200.0	39.5
220.0	37.8
240.0	36.0
260.0	34.1
280.0	32.0
300.0	29.8
320.0	27.5
340.0	25.1
360.0	22.6
380.0	20.0
400.0	17.3
420.0	14.4
422.8	14.0

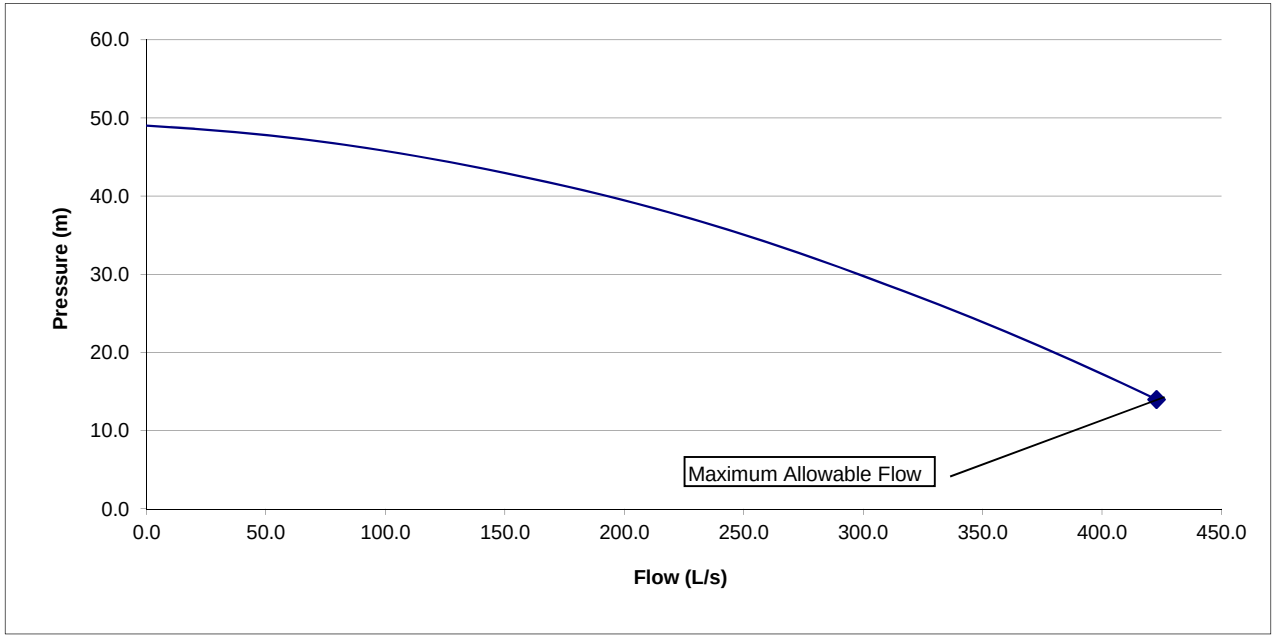
Fire Flow Analysis

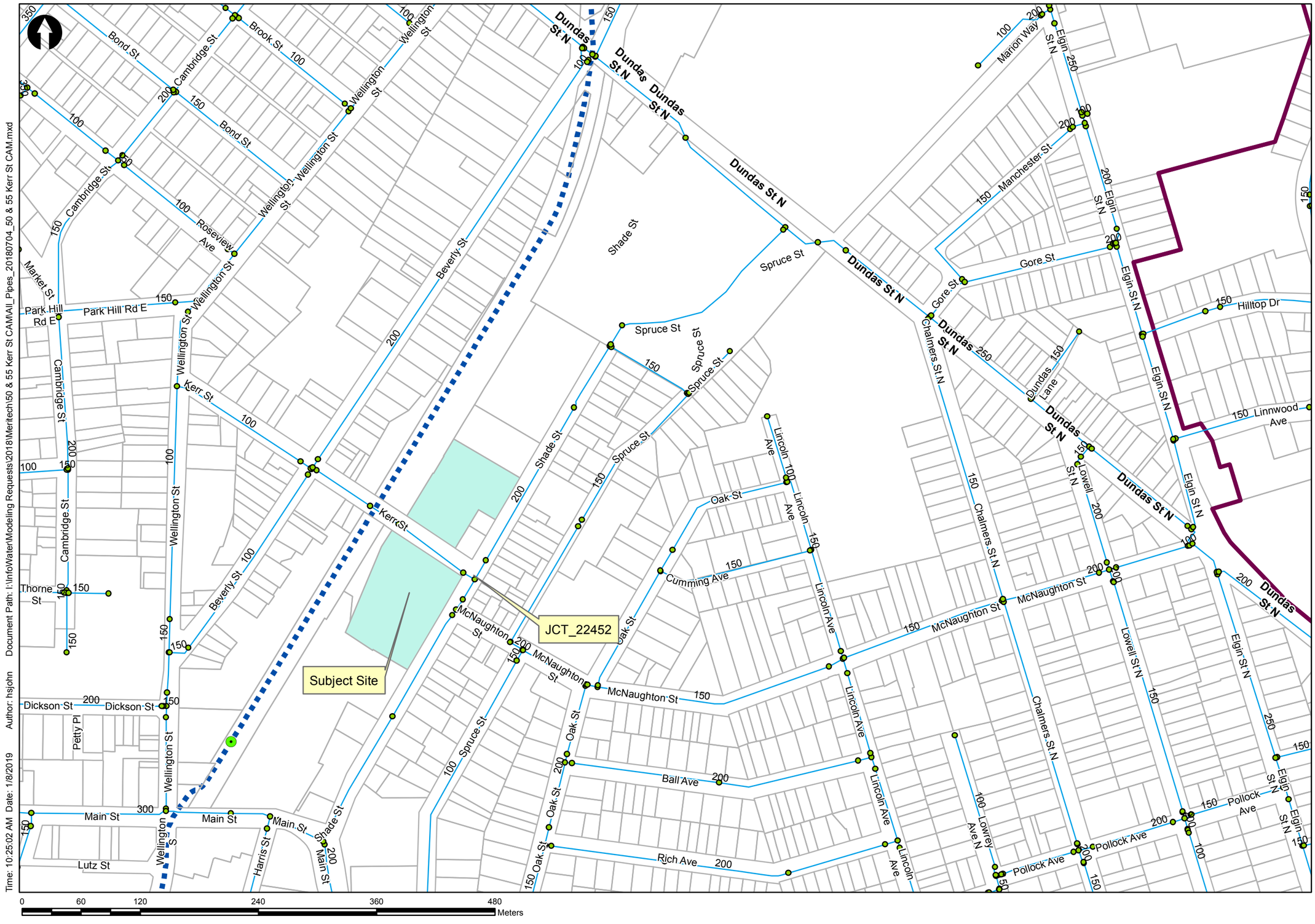
Fire Flow Node:	JCT_14978
Design Flow (L/s):	422.8
Design Pressure (m)	14.0

The final adjusted flow at the node to maintain the minimum design pressure (14m (140 kPa)) at ALL locations within the pressure zone.

The lowest allowable pressure at the node to maintain the minimum design pressure (14m (140 kPa)) at ALL locations within the pressure zone.

The constraining node within the pressure zone that drops to the minimum design pressure of (14m (140 kPa)) during the design flow.





Time: 10:25:02 AM Date: 1/8/2019 Author: hsjohn Document Path: I:\InfoWater\Modeling Requests\2018\Meritech\50 & 55 Kerr St CAM\All_Pipes_20180704_50 & 55 Kerr St CAM.mxd

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Water Services

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Legend

TYPE
- Active
- Domain

TYPE
- Active
- Domain

TYPE
- Active
- Domain

TYPE
- Active
- Domain

TYPE
- Active
- Domain

TYPE
- Active
- Domain
- Highway
- Arterial/Collector
- Local
- Private
- Proposed Roads
- Pressure Zone
- Assessment Parcels (MPAC)
- ION Stations (Stage 2)
- LRT
- Subject Site

50 & 55 Kerr St., Cambridge