

May 6, 2024
File: 1614-993270/29

Attention: Mr. Kevin Dolishny, P.Eng.
Region of Waterloo
Senior Engineer, Water and Wastewater Services
150 Frederick Street
Kitchener ON N2G 4J3

Dear Mr. Dolishny,

Reference: Upper Greengate Subdivision, City of Cambridge, Draft Plan 30T- 20104 (Greengate Village Ltd. and LVH Developments (CW) Inc.) Water Distribution System Analysis Update - Letter Addendum to the Functional Servicing and Stormwater Management Report, April 2020 to Support an Additional 59 Units on Block 8

This letter provides an update related to the water distribution analysis for the proposed Upper Greengate Subdivision located in the City of Cambridge (City). It also serves as an Addendum to the Functional Servicing and Stormwater Management Report dated April 2020 to support an application to increase density on Block 8 of the Upper Greengate Subdivision Plan.

A Water Distribution Analysis was previously completed for the Upper Greengate Subdivision and findings were presented in the Functional Servicing and Stormwater Management Report dated April 2020 prepared by Stantec Consulting Ltd. in support of the Draft Plan Approval of the subject lands. The Draft Plan Approval has since been granted by the City with a condition that a Final Water Distribution Analysis shall be provided to confirm that water supply pressure and volumes are adequate under the final configuration to meet the requirements of the subdivision. Accordingly, an updated letter was prepared in February 2024 (attached) to present any changes from the 2020 Water Modeling Analysis and to confirm that the required domestic water demand and fire flows to the subdivision can be achieved through the proposed watermains and fire hydrants shown on the detailed servicing drawings dated February 2024 prepared for the subdivision.

The letter prepared in February 2024 confirmed that the domestic water demand calculations and water demand allocation presented in the 2020 Water Distribution Analysis are still valid and that no revision to the Water Distribution Analysis was required. The Client (Greengate Village Limited) has since requested a redline revision to the Draft Approved 30T-20104, OPA 64 and Zoning RM3 Site Specific 4.1.441(5) to increase dwelling units on Block 8 of 30T-20104 from 132 units to 191 units. This letter has been prepared to present the updated water analysis based on the increased water demand for Block 8 and to confirm that the required domestic water demand and fire flows to the subdivision can be achieved through the proposed watermains and fire hydrants shown on the detailed servicing drawings prepared for the subdivision.

The fire flow demands for the proposed subdivision are determined using the *Water Supply for Public Fire Protection, A Guide to Recommended Practice (1999)*, *Fire Underwriter's Survey (FUS)*. Based on the FUS Manual, the 2020 Water Distribution Analysis was completed to achieve the following fire flow requirements:

- Single detached residential areas: 6,000 L/min (100 L/s)
- Multi-residential Blocks: 8,000 L/min (133 L/s)
- Apartment Block: 12,000 L/min (200 L/s)

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Mr. Kevin Dolishny, P.Eng.
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**Reference: Upper Greengate Subdivision, City of Cambridge, Draft Plan 30T- 20104
(Greengate Village Ltd. and LVH Developments (CW) Inc.)
Water Distribution System Analysis Update - Letter Addendum to the Functional Servicing
and Stormwater Management Report, April 2020 to Support an Additional 59 Units on Block 8**

We have reviewed and confirmed that the proposed increased demand with an additional 59 residential units within Block 8 of the Upper Greengate Subdivision can be serviced in compliance with all requirements of the City of Cambridge, Region of Waterloo and the MECP, with sufficient water supply available to the proposed development. Please find the results of the model update appended to this letter for your records.

Based on the above review and confirmation, we recommend that this Letter Addendum be considered sufficient to satisfy the submission requirements for an updated Functional Servicing Report identified in the pre-consultation comments dated February 25, 2024.

We trust this letter is satisfactory and sufficient for your purposes; however, should you have any questions or comments, please do not hesitate to contact the undersigned.

Regards,

STANTEC CONSULTING LTD.



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Attachments: Proposed Water Distribution Network Model Output Files
February 2024 Water Analysis Update Letter

- c. Mr. Al Allendorf, Greengate Village Limited
Mr. Kevin Brousseau / Mr. Hitesh Lad, Stantec Consulting Ltd.
Mr. Adam Ripper, City of Cambridge

Upper Greengate - 1045 Main Street, Cambridge
Active Scenario: Max Day + 133 L/s Fire Flow
Scenario: Max Day + 133 L/s Fire Flow



Upper Greengate - 1045 Main Street, Cambridge

FlexTable: Junction Table

Active Scenario: Avg Day

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-1	296.50	0.00	349.05	514
J-2	296.20	0.00	349.05	517
J-3	293.70	0.00	349.05	542
J-4	292.35	0.00	349.05	555
J-5	291.20	0.10	349.05	566
J-6	296.60	0.00	349.05	513
J-7	296.50	0.10	349.05	514
J-8	296.40	0.15	349.05	515
J-9	292.80	0.10	349.05	550
J-10	292.40	1.23	349.05	554
J-11	296.45	0.00	349.05	515
J-12	295.30	0.20	349.05	526
J-13	295.00	0.00	349.05	529

Upper Greengate - 1045 Main Street, Cambridge

FlexTable: Junction Table

Active Scenario: Max Day

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-1	296.50	0.00	348.98	514
J-2	296.20	0.00	348.98	517
J-3	293.70	0.00	348.98	541
J-4	292.35	0.00	348.98	554
J-5	291.20	0.20	348.98	565
J-6	296.60	0.00	348.98	513
J-7	296.50	0.20	348.98	514
J-8	296.40	0.30	348.98	515
J-9	292.80	0.20	348.98	550
J-10	292.40	2.46	348.98	554
J-11	296.45	0.00	348.98	514
J-12	295.30	0.40	348.98	525
J-13	295.00	0.00	348.98	528

Upper Greengate - 1045 Main Street, Cambridge

FlexTable: Junction Table

Active Scenario: Peak Hour

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-1	296.50	0.00	348.79	512
J-2	296.20	0.00	348.79	515
J-3	293.70	0.00	348.79	539
J-4	292.35	0.00	348.79	552
J-5	291.20	0.30	348.79	564
J-6	296.60	0.00	348.79	511
J-7	296.50	0.30	348.78	512
J-8	296.40	0.45	348.78	513
J-9	292.80	0.30	348.78	548
J-10	292.40	3.69	348.78	552
J-11	296.45	0.00	348.78	512
J-12	295.30	0.60	348.78	523
J-13	295.00	0.00	348.78	526

Upper Greengate - 1045 Main Street, Cambridge

FlexTable: Junction Table

Active Scenario: Min Hour

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-1	296.50	0.00	349.09	515
J-2	296.20	0.00	349.09	518
J-3	293.70	0.00	349.09	542
J-4	292.35	0.00	349.09	555
J-5	291.20	0.05	349.09	567
J-6	296.60	0.00	349.09	514
J-7	296.50	0.05	349.09	515
J-8	296.40	0.07	349.09	516
J-9	292.80	0.05	349.09	551
J-10	292.40	0.62	349.09	555
J-11	296.45	0.00	349.09	515
J-12	295.30	0.10	349.09	526
J-13	295.00	0.00	349.09	529

Upper Greengate - 1045 Main Street, Cambridge
 Fire Flow Node FlexTable: Fire Flow Results Table
 Active Scenario: Max Day + 133 L/s Fire Flow

Label	Satisfies Fire Flow Constraints?	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (System Lower Limit) (kPa)	Pressure (Calculated System Lower Limit) (kPa)	Junction w/ Minimum Pressure (System)
J-1	True	133.00	138.00	140	477	140	476	J-6
J-2	True	133.00	138.00	140	453	140	474	J-7
J-3	True	133.00	138.00	140	468	140	468	J-7
J-4	True	133.00	138.00	140	420	140	431	J-5
J-5	True	133.20	138.20	140	373	140	420	J-4
J-6	True	133.00	138.00	140	466	140	467	J-7
J-7	True	133.20	138.20	140	461	140	462	J-11
J-8	True	133.30	138.30	140	451	140	450	J-11
J-9	True	133.20	138.20	140	476	140	450	J-11
J-10	True	135.46	140.46	140	469	140	450	J-11
J-11	True	133.00	138.00	140	331	140	343	J-12
J-12	True	133.40	138.40	140	281	140	284	J-13
J-13	True	133.00	138.00	140	202	140	281	J-12

Upper Greengate - 1045 Main Street, Cambridge
 Fire Flow Node FlexTable: Fire Flow Results Table
 Active Scenario: Max Day + 200 L/s Fire Flow

Label	Satisfies Fire Flow Constraints?	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (System Lower Limit) (kPa)	Pressure (Calculated System Lower Limit) (kPa)	Junction w/ Minimum Pressure (System)
J-1	True	200.00	205.00	140	420	140	419	J-6
J-2	True	200.00	205.00	140	367	140	414	J-7
J-3	True	200.00	205.00	140	371	140	384	J-4
J-4	True	200.00	205.00	140	257	140	268	J-5
J-5	True	200.20	205.20	140	144	140	257	J-4
J-6	True	200.00	205.00	140	399	140	400	J-7
J-7	True	200.20	205.20	140	387	140	388	J-11
J-8	True	200.30	205.30	140	365	140	365	J-11
J-9	True	200.20	205.20	140	380	140	365	J-11
J-10	True	202.46	207.46	140	360	140	365	J-11
J-11	False	200.00	198.76	140	140	140	151	J-12
J-12	False	200.40	175.12	140	140	140	143	J-13
J-13	False	200.00	151.21	140	140	140	234	J-12

Upper Greengate - 1045 Main Street, Cambridge

FlexTable: Junction Table

Active Scenario: Max Day + 133 L/s Fire Flow to J-5

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-1	296.50	0.00	345.49	479
J-2	296.20	0.00	344.50	473
J-3	293.70	0.00	342.02	473
J-4	292.35	0.00	336.24	430
J-5	291.20	133.20	330.63	386
J-6	296.60	0.00	345.01	474
J-7	296.50	0.20	344.62	471
J-8	296.40	0.30	344.62	472
J-9	292.80	0.20	344.62	507
J-10	292.40	2.46	344.62	511
J-11	296.45	0.00	344.62	471
J-12	295.30	0.40	344.62	483
J-13	295.00	0.00	344.62	486

Upper Greengate - 1045 Main Street, Cambridge

FlexTable: Junction Table

Active Scenario: Max Day + 200 L/s Fire Flow to J-10

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-1	296.50	0.00	339.96	425
J-2	296.20	0.00	339.32	422
J-3	293.70	0.00	337.72	431
J-4	292.35	0.00	337.72	444
J-5	291.20	0.20	337.72	455
J-6	296.60	0.00	338.21	407
J-7	296.50	0.20	336.81	394
J-8	296.40	0.30	334.54	373
J-9	292.80	0.20	332.55	389
J-10	292.40	202.46	330.18	370
J-11	296.45	0.00	334.54	373
J-12	295.30	0.40	334.54	384
J-13	295.00	0.00	334.54	387

Upper Greengate - 1045 Main Street, Cambridge

FlexTable: Junction Table

Active Scenario: Max Day + 133 L/s Fire Flow to J-12

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)
J-1	296.50	0.00	345.49	479
J-2	296.20	0.00	345.19	479
J-3	293.70	0.00	344.44	497
J-4	292.35	0.00	344.44	510
J-5	291.20	0.20	344.44	521
J-6	296.60	0.00	344.67	470
J-7	296.50	0.20	344.00	465
J-8	296.40	0.30	342.94	455
J-9	292.80	0.20	342.94	491
J-10	292.40	2.46	342.94	495
J-11	296.45	0.00	331.59	344
J-12	295.30	133.40	325.73	298
J-13	295.00	0.00	325.73	301

Upper Greengate - 1045 Main Street, Cambridge

FlexTable: Pipe Table

Active Scenario: Max Day + 133 L/s Fire Flow to J-5

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Hazen-Williams C	Minor Loss Coefficient (Local)	Flow (L/s)	Velocity (m/s)
P-1	22	R-1	PMP-1	300.0	140.0	1.330	136.76	1.93
P-2	29	PMP-1	J-1	300.0	140.0	1.330	136.76	1.93
P-3	56	J-1	J-2	200.0	140.0	1.330	56.19	1.79
P-4	163	J-2	J-3	200.0	140.0	1.330	56.19	1.79
P-5	66	J-3	J-4	200.0	140.0	1.330	133.20	4.24
P-6	64	J-4	J-5	200.0	140.0	1.330	133.20	4.24
P-7	106	J-1	J-6	300.0	140.0	1.330	80.57	1.14
P-8	80	J-6	J-7	300.0	140.0	1.330	80.57	1.14
P-9	82	J-7	J-8	300.0	140.0	1.330	3.36	0.05
P-10	69	J-8	J-9	300.0	140.0	1.330	2.66	0.04
P-11	87	J-9	J-10	300.0	140.0	1.330	2.46	0.03
P-12	88	J-7	J-3	200.0	140.0	1.330	77.01	2.45
P-13	147	J-8	J-11	200.0	140.0	1.330	0.40	0.01
P-14	67	J-11	J-12	200.0	140.0	1.330	0.40	0.01
P-15	96	J-12	J-13	200.0	140.0	1.330	0.00	0.00
P-21	45	R-1	J-1	300.0	140.0	1.330	(N/A)	(N/A)

Upper Greengate - 1045 Main Street, Cambridge

FlexTable: Pipe Table

Active Scenario: Max Day + 200 L/s Fire Flow to J-10

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Hazen-Williams C	Minor Loss Coefficient (Local)	Flow (L/s)	Velocity (m/s)
P-1	22	R-1	PMP-1	300.0	140.0	1.330	203.76	2.88
P-2	29	PMP-1	J-1	300.0	140.0	1.330	203.76	2.88
P-3	56	J-1	J-2	200.0	140.0	1.330	44.37	1.41
P-4	163	J-2	J-3	200.0	140.0	1.330	44.37	1.41
P-5	66	J-3	J-4	200.0	140.0	1.330	0.20	0.01
P-6	64	J-4	J-5	200.0	140.0	1.330	0.20	0.01
P-7	106	J-1	J-6	300.0	140.0	1.330	159.39	2.25
P-8	80	J-6	J-7	300.0	140.0	1.330	159.39	2.25
P-9	82	J-7	J-8	300.0	140.0	1.330	203.36	2.88
P-10	69	J-8	J-9	300.0	140.0	1.330	202.66	2.87
P-11	87	J-9	J-10	300.0	140.0	1.330	202.46	2.86
P-12	88	J-7	J-3	200.0	140.0	1.330	-44.17	1.41
P-13	147	J-8	J-11	200.0	140.0	1.330	0.40	0.01
P-14	67	J-11	J-12	200.0	140.0	1.330	0.40	0.01
P-15	96	J-12	J-13	200.0	140.0	1.330	0.00	0.00
P-21	45	R-1	J-1	300.0	140.0	1.330	(N/A)	(N/A)

Upper Greengate - 1045 Main Street, Cambridge

FlexTable: Pipe Table

Active Scenario: Max Day + 133 L/s Fire Flow to J-12

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Hazen-Williams C	Minor Loss Coefficient (Local)	Flow (L/s)	Velocity (m/s)
P-1	22	R-1	PMP-1	300.0	140.0	1.330	136.76	1.93
P-2	29	PMP-1	J-1	300.0	140.0	1.330	136.76	1.93
P-3	56	J-1	J-2	200.0	140.0	1.330	29.73	0.95
P-4	163	J-2	J-3	200.0	140.0	1.330	29.73	0.95
P-5	66	J-3	J-4	200.0	140.0	1.330	0.20	0.01
P-6	64	J-4	J-5	200.0	140.0	1.330	0.20	0.01
P-7	106	J-1	J-6	300.0	140.0	1.330	107.03	1.51
P-8	80	J-6	J-7	300.0	140.0	1.330	107.03	1.51
P-9	82	J-7	J-8	300.0	140.0	1.330	136.36	1.93
P-10	69	J-8	J-9	300.0	140.0	1.330	2.66	0.04
P-11	87	J-9	J-10	300.0	140.0	1.330	2.46	0.03
P-12	88	J-7	J-3	200.0	140.0	1.330	-29.53	0.94
P-13	147	J-8	J-11	200.0	140.0	1.330	133.40	4.25
P-14	67	J-11	J-12	200.0	140.0	1.330	133.40	4.25
P-15	96	J-12	J-13	200.0	140.0	1.330	0.00	0.00
P-21	45	R-1	J-1	300.0	140.0	1.330	(N/A)	(N/A)

Upper Greengate - 1045 Main Street, Cambridge
Active Scenario: Min Hour
Scenario: Min Hour

