
TYLin Servicing Memorandum
May 8, 2023

TECHNICAL MEMORANDUM

DATE	May 8, 2023
TO	Anastasiya Summers
CC	Miriam Polga, Justin Lee
SUBJECT	Springbrook Servicing Study Update
FROM	Kevin Brown P.Eng
PROJECT NUMBER	10781



1 Introduction

T.Y. Lin International Canada Inc. (TYLin) was retained by the Region of Peel to complete a water and wastewater servicing strategy update for the redevelopment of the Springbrook Settlement Area. The servicing update considers the revised population projections provided by the Region (Table 1-1). This memorandum serves to outline the necessary updates required in “Springbrook Settlement Area Study” (July 2018). TYLin has reviewed the previous strategies and have revised the servicing strategy where needed.

2 Population Context

Springbrook’s future development comprises 11 blocks (A through K). These blocks are situated at the intersection of Queen Street West and Creditview Road in the City of Brampton. A recent Tertiary Plan denotes a proposed residential and employment population of 10,226. The original 2018 study identified a population projection of 1,202 people in the area. It is to be noted that blocks B, E, G, K were included in original study, but not in the updated tertiary plan. For these blocks, population values from the previous secondary plan were retained for the purpose of this servicing review. Current development population values are documented in Table 1-1.

FIGURE 1-1 SPRINGBROOK STUDY AREA

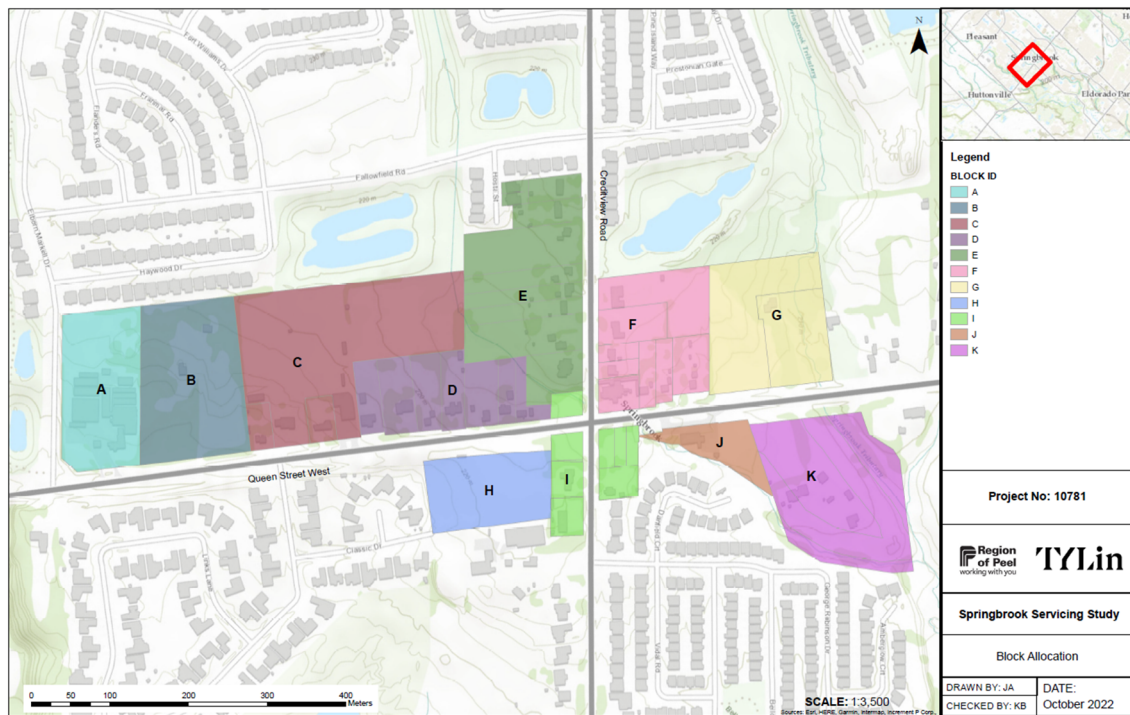


TABLE 1-1 REVISED POPULATION PROJECTIONS

Block ID	Residential Population	Employment Population	Total Population
A ⁽²⁾	1759	92	1851
B ⁽¹⁾	76	0	76
C	2094	72	2166
D	2021	114	2135
E ⁽¹⁾	103	0	103
F	1129	77	1206
G ⁽¹⁾	46	0	46
H	1102	72	1174
I	885	91	976
J	273	45	318
K ⁽¹⁾	175	0	175
Total	9663	563	10226

Notes:

1. Not updated in current Tertiary Plan. 2018 population projections are considered.
2. Proposed Tertiary Plan population as per correspondence received in February 2023 – Can be viewed in Appendix C-2

Based on the area-based proportion of SGUs, the current development plan for the Springbrook settlement area are greater than the Region's previous forecast (October 2018), which accounted for a total population of 558 People + Jobs by 2041. The proposed development lies within four adjacent SGUs: B0239, B0340, B0256 and B0057.

TABLE 1-2 POPULATION GROWTH FORECAST COMPARISON

Scenario / Year	Population	Employment	Total
Growth to 2041 based on Weighted SGUs¹	501	57	558
Proposed Development Growth²	9663	563	10226
1) <i>Weighted Growth takes proportion of SGUs based on Area, using 2016 and 2041 forecasts from SGU Scenario 16 (October 2018)</i>			
2) <i>Revised Planning Forecasts from the Region of Peel.</i>			

This servicing study reviews the impacts of the above increase.

3 Water Servicing

3.1 Governing Policies

3.1.1 Peel Region Infrastructure Design Criteria

The Region of Peel *2020 Water and Wastewater Master Plan* for Lake-Based Systems (last updated June 2020) was used to define the design criteria for the Springbrook Servicing Study.

Table 3-1 outlines the design criteria to be used for watermain within the Region of Peel.

TABLE 3-1 WATER DESIGN CRITERIA

Consumption Rates:	Average Day Demand	Max Day Factor	Peak Hour Factor	Fire Flow
Residential Average Daily Demand	270 Lpcd	1.8x	3.0x	83.3 L/s
Employment Average Daily Demand	250 Lpcd	1.4x	3.0x	250 L/s
Pressures				
Minimum Pressures during Peak Hourly Demand	275 kPa (40 psi)			
Maximum Pressure during Minimum Hourly Demand	690 kPa (100 psi)			
Minimum Fire Flow Pressure under Fire Flow plus Max Daily Demand	140 kPa (20 psi)			

3.2 Water Servicing Analysis

Using the design criteria outlined in Section 3-1, the Average Day Demand (ADD), Maximum Day Demand (MDD), and Peak Hour Demands (PHD) for the proposed development were calculated. Water demands for the current development plan exceed those from the Region of Peel's 2017 forecast. These demands can be seen in Table 3-3.

TABLE 3-3 WATER DEMANDS FOR SPRINGBROOK SETTLEMENT AREA

Demand Scenario	Proposed Development	SGU Weighted Estimate (From 2018) ¹
Average Day Demand (L/s)	31.8	1.7
Maximum Day Demand (L/s)	56.6	3.1
Peak Hour Demand (L/s)	95.5	5.2

1) Demand Scenarios calculated from Population figures denoted on Table 1-2 - Growth to 2041 based on Weighted SGUs.

Using the design criteria outlined in Table 3-1, the ADD, MDD, and PHD per block were calculated. These demands are summarized in Table 3-4.

TABLE 3-4 DESIGN WATER DEMANDS, BY BLOCK

Block ID	Average Day Demand (L/s)	Max Day Demand (L/s)	Peak Hour Demand (L/s)
A	5.76	10.27	17.29
B	0.24	0.43	0.71
C	6.75	12.07	20.26
D	6.65	11.83	19.94
E	0.32	0.58	0.97
F	3.75	6.66	11.25
G	0.14	0.26	0.43
H	3.65	6.49	10.96
I	3.03	5.35	9.09
J	0.98	1.72	2.95
K	0.55	0.98	1.64
Total	31.8	56.6	95.5

3.3 Servicing Recommendations

Utilizing the information in Table 3-4, modelling was undertaken by the Region of Peel. Results of the modelling are included in Appendix D. The following four scenarios were analyzed:

- 1) 2021 Max Day Demand
- 2) 2021 Max Day Demand + Fire Flow
- 3) 2041 Max Day Demand
- 4) 2041 Max Day Demand + Fire Flow

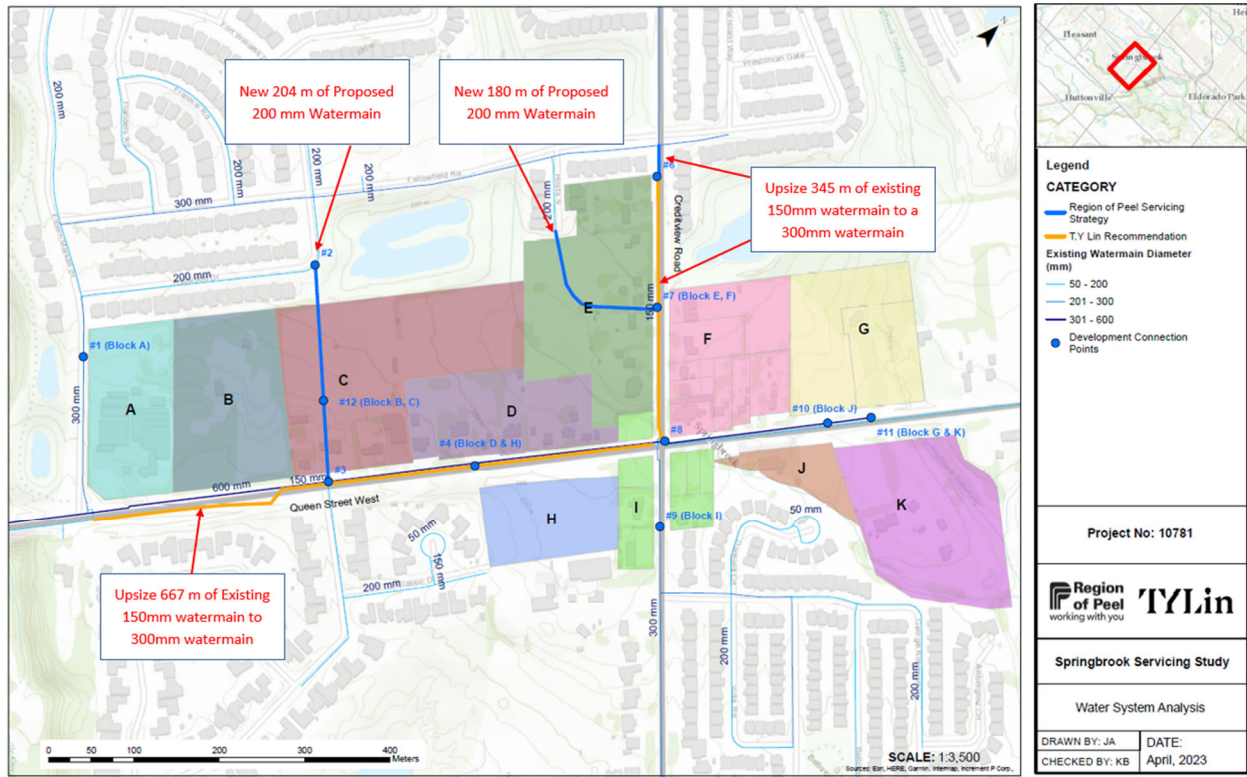
The current servicing strategy is based on providing water service to the blocks via connections to existing watermains on Queen Street West, Elbern Markell Drive, Haywood Drive, Creditview Road, and Classic Drive. There are two new watermains proposed within the study area. A proposed 200 mm north south watermain connecting to Haywood Drive and Queen Street West will provide additional looping to system, enhancing security of supply. This 200 mm main will provide service to future buildings located more internal to the development. The proposed servicing strategy also includes upsizing the existing 150 mm distribution main on Creditview Road north of Queen Street to a 300 mm watermain to service the proposed mixed-use areas along Creditview Road.

The overall connectivity of the development blocks is as follows:

- Block A – connection to 300 mm watermain on Elbern Markell Drive.
- Block D & H – connection to watermain on Queen Street, **to be upgraded from 150 mm to 300 mm** from Elbern Markell Drive to Creditview Road.
- Block B, C – connections the 200 mm watermain on Haywood Drive and 200 mm watermain on Links Lane via a proposed 200 mm north-south watermain.
- Block E, F – connections to 150 mm watermain on Creditview Road; **proposed 300 mm upsized watermain on Creditview Road**, approximately 160 m north of Queen Street; and extension of servicing on proposed road right of way (through Block E) and on Creditview Road to enhance connectivity.
- Blocks G – connection to 600 mm sub-transmission watermain via 200 mm stub on Queen Street.
- Blocks J, K – connections to 600 mm sub-transmission watermain via 200 mm stub on Queen Street.
- Block I – connection to 300 mm watermain on Creditview Road.

The modelling results confirm that, there are no concerns with reference to pressures (all above 50 psi) and velocities (none greater than 1.0 m/s). Minimum fire flows (typically 83.3 L/s for residential units and 250 L/s for ICI units) are available at all junctions.

FIGURE 3-1 REGION OF PEEL PREFERRED WATER SERVICING STRATEGY



Max Day Demand for the various junctions shown on Figure 3-1 can be seen on Table 3-5.

TABLE 3-5 FIRE FLOW BY JUNCTION BASED ON PREFERRED WATER SERVICING STRATEGY

Junction ID	Watermain Connection	Blocks Served	Total Population Served	Max Day Demand (L/s)	MDD + FF (2021) Available FF L/s	MDD + FF (2041) Available FF L/s
1 (J-NEW-6217)	300 mm on Elbern Markell Drive	A	1,851	10.3	824	839
7 (J-NEW-6221)	Upsize 345 m of existing 150 mm to 300 mm on Creditview Road	E, F	1,309	7.2	739	754
4 (J-NEW-6220)	Upsize 667 m of existing 150 mm to 300 mm on Queen Street West	D, H	3,309	18.3	655	669
9 (J-NEW-6222)	300 mm on Creditview Road	I	976	5.4	767	781
10 (6586196)	600 mm sub-transmission watermain via 200 mm stub on Queen Street	J	318	1.7	1,232	1,273
11 (6586197)	600 mm sub-transmission watermain via 200 mm stub on Queen Street	G & K	221	1.2	1,235	1,275
12 (J-NEW-6217)	New 241 m watermain of 200 mm	B & C	2,242	12.5	392	399

3.4 Constraints for Servicing Growth

The Region of Peel’s servicing strategy included a future provision to extend the dead ended watermain on Hosta Street to Creditview Road with a 200mm watermain. This provision requires a 200 mm watermain to enter block E. With the development densities for Block E not having been updated in the Tertiary Plan, upsizing the existing 150mm to a 300mm watermain along the full stretch of Creditview Road (from Queen to Fallowfield) is recommended to allow for enhancement to the water distribution system.

The hydraulic modeling results provided by the Region indicate that the existing 150mm watermain along Queen Street between Creditview Road and Elbern Markell Drive cannot provide the required non-residential fire flow to Blocks D and H. It is recommended that it be upsized to a 300mm watermain. Providing this upgrade will improve the available fire flow to Block D and H to 669 L/s under 2041 conditions.

4 Wastewater

4.1 Governing Policies

4.1.1 Peel Region Infrastructure Design Criteria

The Region of Peel *2020 Water and Wastewater Master Plan* for Lake-Based Systems (2020) Table 4-1 outlines the design criteria to be used for sanitary sewers within Peel Region.

TABLE 4-1 WASTEWATER DESIGN CRITERIA

Residential Average Day Flow	290 Lpcd
Employment Average Day Flow	270 Lpcd
Peaking Factor	Harmon
Inflow and infiltration allowance	0.26 L/s/ha
Maximum Velocity	3.5 m/sec
Maximum Capacity	85 %

4.2 Wastewater Analysis

The Average Dry Weather Flow (DWF), Peak Dry Weather Flow and Design Flows were calculated using the design criteria described in Table 4-1. The estimated wastewater flows for the entire Springbrook development are presented in Table 4-2.

TABLE 4-2 WASTEWATER FLOWS FOR SPRINGBROOK SETTLEMENT AREA

Flow Scenario	Proposed Development	SGU Weighted Estimate (2041) ¹
Average Dry Flow (L/s)	34.2	1.9
Peak Dry Flow (L/s)	100.7	8.0
Peak Wet Weather (L/s)	107.9	15.1

1) Flow Scenarios calculated from population figures denoted on Table 1-2 - Growth to 2041 based on Weighted SGUs.

Using the design criteria outlined in Table 4-1, The Average DWF, Peak DWF, and Design Flows for the proposed developments were calculated. These flows are summarized in Table 4-3.

TABLE 4-3 WASTEWATER DESIGN FLOWS BY BLOCK

Block ID	Residential Population	Employment Population	Total Population	Area (ha)	Average Flow (L/s)	Harmon Peaking Factor	Peak Dry Weather Flow (L/s)	Extraneous Flow Allowance (L/s)	Design Flow (L/s)
A	1,759	92	1,851	2.22	6.2	3.61	22.36	0.58	22.94
B	76	0	76	2.75	0.26	4.00	1.02	0.72	1.74
C	2,094	72	2,166	4.20	7.25	3.56	25.81	1.09	26.90
D	2,021	114	2,135	2.57	7.1	3.56	25.44	0.67	26.11
E	103	0	103	3.66	0.35	4.00	1.38	0.95	2.33
F	1,129	77	1,206	2.60	4.03	3.75	15.10	0.68	15.77
G	46	0	46	2.71	0.15	4.00	0.62	0.70	1.32
H	1,102	72	1,174	1.80	3.92	3.75	14.73	0.47	15.20
I	885	91	976	1.20	3.25	3.81	12.39	0.31	12.70
J	273	45	318	1.16	1.06	4.00	4.23	0.30	4.53
K	175	0	175	2.71	0.6	4.00	2.35	0.70	3.05
Total	9,663	563	10,226	27.6	34.2	2.9	100.7	7.2	107.9

The Design Flow for the entire subdivision are not equal to the sum of the individual blocks since the Peaking Factor decreases with increased population.

4.2.1 Sanitary Sewer Model Summary

Denoted in Table 4-4, the current local sanitary sewers servicing Springbrook are deemed adequate according to Region of Peel Infrastructure Design standards. However, the modelling exercise undertaken by the Region provided upsizing on previously identified sewer diameters to allow for all capacities to be under 85%. The proposed sanitary sewer connecting Block B, C, D, H is to be 375mm. Upsizing is recommended on the existing 450 mm downstream sanitary sewer along Queen Street from a 450 mm to a 525 mm.

The conceptual design for the proposed 375 mm sewer along Queen Street West can be seen on Appendix F. It is established on this figure that the sewer will run from proposed Block D, west to the existing 450 mm sanitary sewer at Queen Street West and Elbern Markell Drive via SMH-6541757. The figure also denotes that the sewer has a slope of 1%. The “Springbrook Settlement Area Study” (2018) states that the proposed sewer will be 640m in length. Blocks D & C are proposed to be a mixed-use area containing some commercial space. As noted in the Region of Peel’s Sanitary Sewer Design Criteria, the obvert of the sewer will be a minimum of 3.5 m (for Commercial Areas) below the centreline of the road allowance. A conceptual design of the above is provided in Appendix F to demonstrate constructability. This figure shall be refined in the detailed design stage.

The conceptual design for the proposed sewer upsizing from 450 mm to 525 mm along Queen Street from Royal West Drive to Mississauga Road can be seen on Appendix G. Invert and obvert elevations can also be found in Appendix G.

TABLE 4-4 SANITARY DESIGN FLOWS IN SHEET SUMMARY

Sanitary Sewer	Blocks Serviced	Pipe Flow Constraint			
		Existing Diameter (mm)	Existing Capacity (L/s)	Max Design Flow (L/s)	Max % Capacity ⁽¹⁾
Proposed 375 mm sewer along Queen Street	B, C, D, H	375	124	70	56%
600 mm sewer on Queen Street West	G, J, K & I (East Side)	600	444	269.9	60%
450 mm sewer along Elbern Markell Drive	A	450	255	124.6	49%
250 mm sewer along Creditview Road, North of Queen Street West	E & F	250	62	50	80%
250 mm sewer along Creditview Road, South of Queen Street West	I (West Side)	250	73	22.5	31%

Note

1. Max Capacity is taken from the dynamic hydraulic model results, included in Appendix E.

4.3 Servicing Recommendations

Based on TYLin’s review of the design flows generated from the currently proposed development, The Region of Peel’s preferred servicing alternative will experience downstream constraints. TYLin has reviewed Alternative 2 from the “Springbrook Settlement Area Study” (2018). This alternative proposed to convey the flows from Blocks B, C and D east to the existing 600 mm sanitary sewer at Queen Street and Creditview Road. TYLin has reviewed the constructability of this alternative and have deemed the alternative to not be feasible. This alternative can be seen on Appendix H “Proposed (Alternative 2) Sanitary Sewer Obverts”.

Utilizing the preferred alternative with changes in diameter from the “Springbrook Settlement Area Study” (2018), the blocks would connect to the existing collection system as seen on Table 4-5:

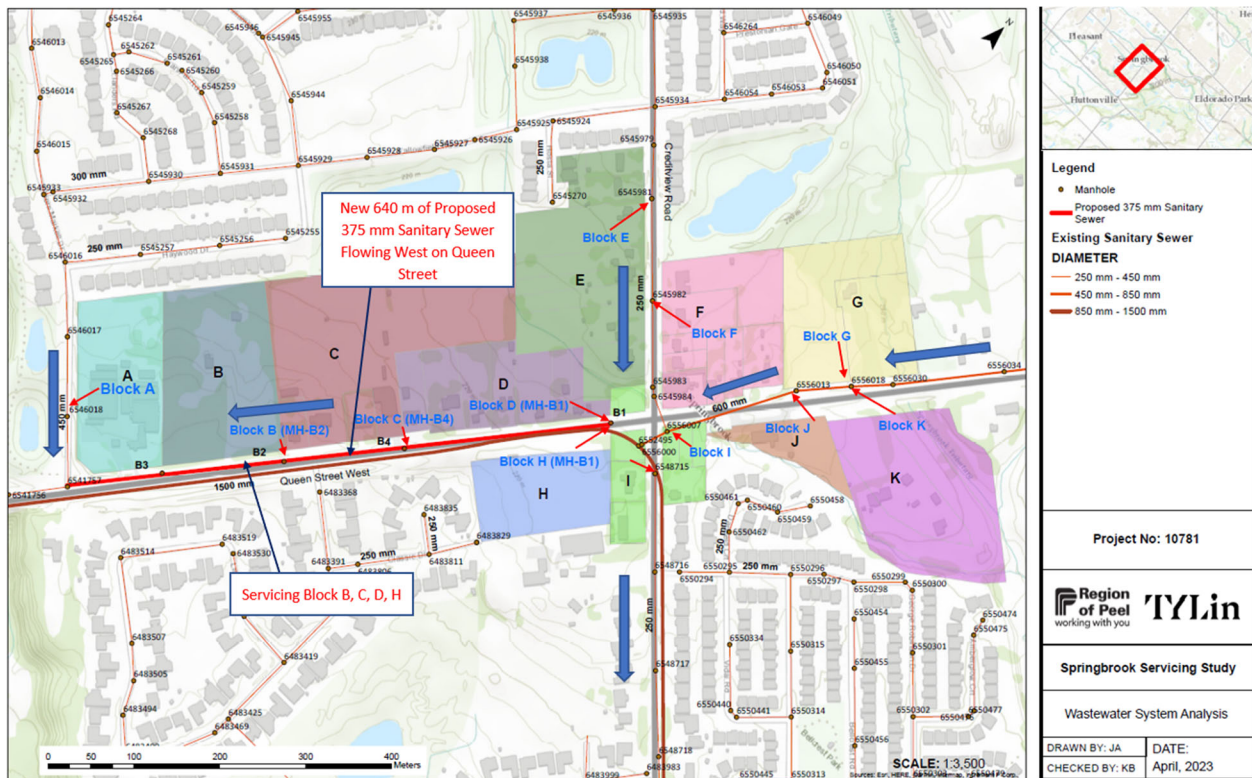
TABLE 4-5 BLOCK TO MANHOLE ALLOCATION

Block	Sanitary Sewer	Manhole	Peak Dry Weather Flow (L/s)	Peak Wet Weather Flow (L/s)
A	450 mm sewer along Elbern Markell Drive & Queen Street West	SMH-6546018	22.4	22.9
B	Proposed 375 mm sewer along Queen Street	B2	1.0	1.7
C	Proposed 375 mm sewer along Queen Street	B4	25.8	26.9
D	Proposed 375 mm sewer along Queen Street	B1	25.4	26.1
E	250 mm sewer along Creditview Road, North of Queen Street West	SMH-6545981	1.4	2.3
F	250 mm sewer along Creditview Road, North of Queen Street West	SMH-6545982	15.1	15.8
G	600 mm sewer on Queen Street West	SMH-6556018	0.6	1.3
H	Proposed 375 mm sewer along Queen Street	B1	14.7	15.2
I (East)	600 mm sewer on Queen Street West	SMH-6556007	6.0	6.2
I (West)	250mm on Creditview Road, South of Queen Street West	SMH-6548715	6.9	7.1
J	600 mm sewer on Queen Street West	SMH-6556013	4.2	4.5
K	600 mm sewer on Queen Street West	SMH-6556018	0.7	3.1

Referring to Figure 4-1 the following shows the sanitary sewer flows from each Block and where they are conveyed to.

- Block A – Drains to the 450 mm sewer on Elbern Markell Drive
- Blocks B, C, D, H – Drain to a proposed 375 mm east-west sewer on the north side of Queen Street.
- Blocks E, F – Drain to the 250 mm sewer on Creditview Road.
- Blocks G, J, K – Drain to the 600 mm sewer on Queen Street.
- Block I – East side drains to the 600mm sewer on Queen Street West, and the west side to the 250mm on Creditview Road.

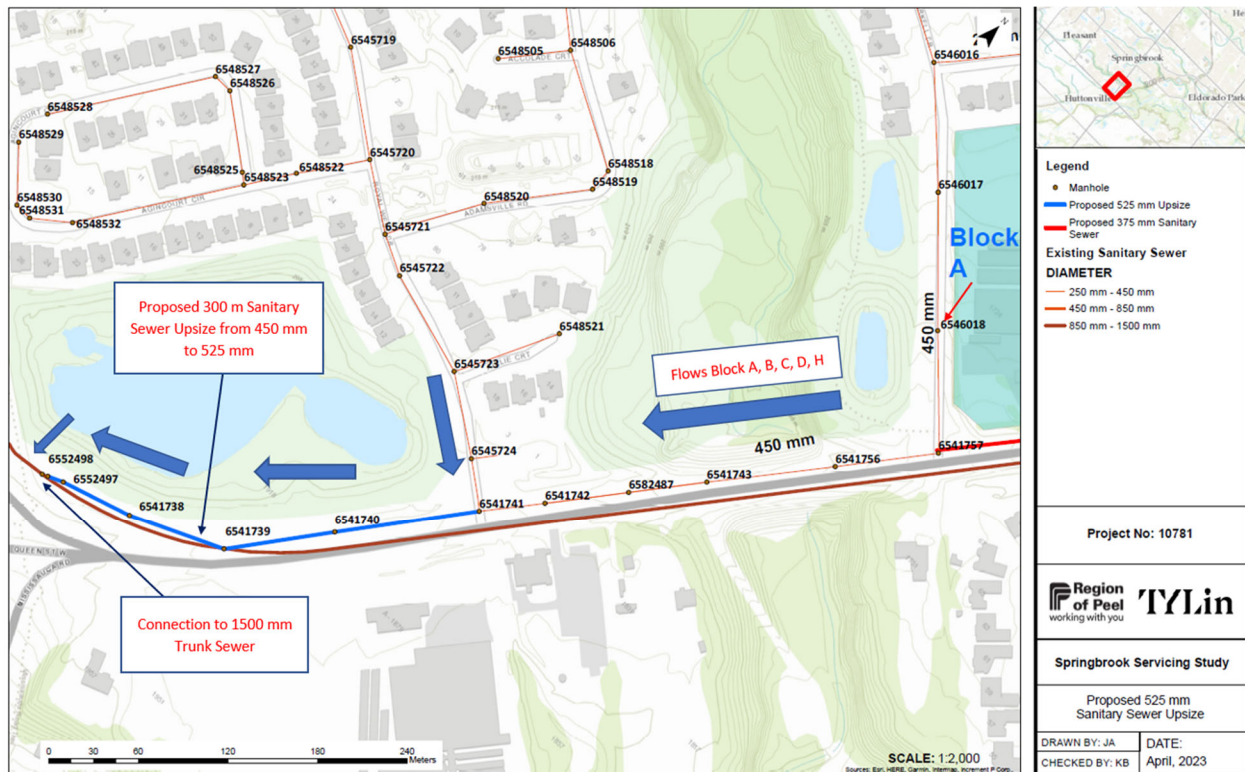
FIGURE 4-1 REGION OF PEEL PREFERRED WASTEWATER SERVICING



4.4 Constraints for Servicing Growth

Given the current proposed development population, the Region's modelling has identified that downstream constraints are likely within the existing 450mm Queen Street sanitary sewer west of Springbrook (between SMH-6541741 and SMH-6552498). Upsizing 300 m of the 450mm sanitary sewer to a 525 mm will accommodate design flows from the proposed development, as per the results provided in Appendix E. The upsizing location can be seen on Figure 4-2.

FIGURE 4-2 PROPOSED 525 MM SANITARY SEWER UPSIZE



The recommended servicing strategy includes a new east-to-west sewer along Queen Street West, which according to the previous servicing strategy may require an easement along the north side. While an easement could likely be negotiated through the redevelopment of Blocks A, C and D, it is unclear at present what specifically is planned for Block B, and whether an easement there is possible. The Region of Peel will need to ensure that entities located in Block B will be participating parties for easement requirements.

It is recommended that flows from Block I be split, with the east side discharging to the 600mm sewer on Queen Street, at SMH-6556007, and the west side to the 250mm on Creditview at SMH-6548715. Although currently there are no capacity constraints on the 250mm Creditview Road sewer, this recommendation is for future planning purposes due to the potential for developers coming in with larger proposed populations.

5 Conclusion

It was found that with an updated population figure of 10,226 people, the original proposed servicing strategy for both water and wastewater is deemed to still be appropriate, provided that some watermain and sewer upgrades are considered.

5.1 Water

The Region of Peel's servicing strategy included a future provision to extend the dead ended watermain on Hosta Street to Creditview Road with a 200mm watermain. This provision requires a 200 mm watermain to enter block E. With the no detail being updated regarding Block E on the current secondary plan, upsizing the existing 150mm to a 300mm watermain along the full stretch of Creditview Road (from Queen to Fallowfield) is recommended to allow for enhancement to the water distribution system.

The hydraulic modeling results provided by the Region indicate that the existing 150mm watermain along Queen Street between Creditview Road and Links Lane cannot provide the required non-residential fire flow to Blocks D and H. It is recommended that the 150 mm between Creditview Road and Elbern Markell Drive be upsized to a 300mm watermain. Providing this upgrade will improve the available fire flow to Block D and H to 669 L/s under 2041 conditions.

5.2 Wastewater

Given the current proposed development population, the Region's modelling has identified that downstream constraints are likely within the existing 450mm Queen Street sanitary sewer west of Springbrook (between SMH-6541741 and SMH-6552498). Upsizing 300 m of this 450mm sanitary sewer to a 525 mm will accommodate design flows from the proposed development, as per the results provided in Appendix E.

6 Appendix A

WATER & WASTEWATER CALCULATIONS



Springbrook Tertiary Plan as of January 25th 2023				Water Demands					Wastewater Servicing							
	Resident Population	Employee Population	Res + Emp	Average Day Demand (Residential) (L/s)	Average Day Demand (Employment) (L/s)	Average Day Demand (Res + Emp) (L/s)	Max Day Demand (L/s)	Peak Hour Demand (L/s)	Average Day Flow (Residential) (L/s)	Average Day Flow (Employment) (L/s)	Average Day Flow (Res + Emp) (L/s)	Harmon Factor	Peak Dry Weather Flow (L/s)	Area (ha)	Extraneous Flow Allowance (L/s)	Design Flow (L/s)
				L/s	L/s	L/s	L/s	L/s	L/s	L/s	L/s	Factor	L/s	ha	L/s	L/s
Block A																
Updated Population as Per Final Memo Updates - 2022.12.22	1759	92	1851	5.5	0.3	5.8	10.27	17.3	5.9	0.3	6.2	3.61	22.36	2.2	0.6	22.9
SUBTOTAL	1,759	92	1,851	5.5	0.3	5.8	10.27	17.3	5.9	0.3	6.2	3.61	22.36	2.2	0.6	22.9
Block B																
Included From Previous Springbrook Study	76	0	76	0.2	0.0	0.2	0.43	0.7	0.3	0.0	0.3	4.00	1.02	2.8	0.7	1.7
SUBTOTAL	76	0	76	0.2	0.0	0.2	0.43	0.7	0.3	0.0	0.3	4.00	1.02	2.8	0.7	1.7
Block C																
B1	489	34	523	1.5	0.1	1.6	2.89	4.9	1.6	0.1	1.7					
B2	505	38	543	1.6	0.1	1.7	2.99	5.1	1.7	0.1	1.8					
B6	253	0	253	0.8	0.0	0.8	1.42	2.4	0.8	0.0	0.8					
B7	253	0	253	0.8	0.0	0.8	1.42	2.4	0.8	0.0	0.8					
B10	297	0	297	0.9	0.0	0.9	1.67	2.8	1.0	0.0	1.0					
B11	297	0	297	0.9	0.0	0.9	1.67	2.8	1.0	0.0	1.0					
SUBTOTAL	2,084	72	2,156	6.5	0.2	6.8	12.07	20.3	7.0	0.2	7.3	3.56	25.81	4.2	1.1	26.9
Block D																
B3	505	38	543	1.6	0.1	1.7	2.99	5.1	1.7	0.1	1.8					
B4	505	38	543	1.6	0.1	1.7	2.99	5.1	1.7	0.1	1.8					
B5	505	38	543	1.6	0.1	1.7	2.99	5.1	1.7	0.1	1.8					
B8	253	0	253	0.8	0.0	0.8	1.42	2.4	0.8	0.0	0.8					
B9	253	0	253	0.8	0.0	0.8	1.42	2.4	0.8	0.0	0.8					
SUBTOTAL	2,021	114	2,135	6.3	0.3	6.6	11.83	19.9	6.8	0.4	7.1	3.56	25.44	2.6	0.7	26.1
Block E																
Included From Previous Springbrook Study	103	0	103	0.3	0.0	0.3	0.58	1.0	0.3	0.0	0.3	4.00	1.38	3.7	1.0	2.3
SUBTOTAL	103	0	103	0.3	0.0	0.3	0.58	1.0	0.3	0.0	0.3	4.00	1.38	3.7	1.0	2.3
Block F																
C1	831	77	908	2.6	0.2	2.8	4.99	8.5	2.8	0.2	3.0					
C2	92	0	92	0.3	0.0	0.3	0.52	0.9	0.3	0.0	0.3					
C3	114	0	114	0.4	0.0	0.4	0.64	1.1	0.4	0.0	0.4					
C4	92	0	92	0.3	0.0	0.3	0.52	0.9	0.3	0.0	0.3					
SUBTOTAL	1,129	77	1,206	3.5	0.2	3.8	6.66	11.3	3.8	0.2	4.0	3.75	15.10	2.6	0.7	15.8
Block G																
Included From Previous Springbrook Study	46	0	46	0.1	0.0	0.1	0.26	0.4	0.2	0.0	0.2	4.00	0.62	2.7	0.7	1.3
SUBTOTAL	46	0	46	0.1	0.0	0.1	0.26	0.4	0.2	0.0	0.2	4.00	0.62	2.7	0.7	1.3
Block H																
D1	311	35	346	1.0	0.1	1.1	1.89	3.2	1.0	0.1	1.2					
D2	552	37	589	1.7	0.1	1.8	3.25	5.5	1.9	0.1	2.0					
D4	138	0	138	0.4	0.0	0.4	0.78	1.3	0.5	0.0	0.5					
D5	101	0	101	0.3	0.0	0.3	0.57	0.9	0.3	0.0	0.3					
SUBTOTAL	1,102	72	1,174	3.4	0.2	3.7	6.49	11.0	3.7	0.2	3.9	3.75	14.73	1.8	0.5	15.2
Block I																
D3 (West Side of Creditview Road)	479	44	523	1.5	0.1	1.6	2.87	4.9	1.6	0.1	1.7	3.96	6.9	0.6	0.2	7.07
E1 (East Side of Creditview Road)	406	47	453	1.3	0.1	1.4	2.47	4.2	1.4	0.1	1.5	4.00	6.0	0.6	0.2	6.19
SUBTOTAL	885	91	976	2.8	0.3	3.0	5.35	9.1	3.0	0.3	3.3	3.81	12.99	1.2	0.3	12.70
Block J																
E2	273	45	318	0.9	0.1	1.0	1.72	3.0	0.9	0.1	1.1	4.00	4.23	1.2	0.3	4.5
SUBTOTAL	273	45	318	0.9	0.1	1.0	1.72	3.0	0.9	0.1	1.1	4.00	4.23	1.2	0.3	4.5
Block K																
Included From Previous Springbrook Study	175	0	175	0.5	0.0	0.5	0.98	1.6	0.6	0.0	0.6	4.00	2.35	2.7	0.7	3.1
SUBTOTAL	175	0	175	0.5	0.0	0.5	0.98	1.6	0.6	0.0	0.6	4.00	2.35	2.7	0.7	3.1
GRAND TOTAL	9,663	563	10,226	30.2	1.6	31.8	56.64	95.5	32.4	1.8	34.2	2.945	100.7	27.6	7.2	107.9
				Average Day Demand (Residential) (L/s)	Average Day Demand (Employment) (L/s)	Average Day Demand (Res + Emp) (L/s)	Max Day Demand (L/s)	Peak Hour Demand (L/s)	Average Day Flow (Residential) (L/s)	Average Day Flow (Employment) (L/s)	Average Day Flow (Res + Emp) (L/s)	Harmon Factor	Peak Dry Weather Flow (L/s)	Area (ha)	Extraneous Flow Allowance (L/s)	Design Flow (L/s)

Assumptions

Water Design Criteria					Wastewater Design Criteria			
Type of Development	Average Day Demand (L/Capita/Day)	Unit	MDD	PHD	Average Day Flow (L/Capita/Day)	Peaking Factor	I&I (L/s/ha)	
Residential	270		1.8	3	290 Harmon		0.26	
ICI	250		1.4	3	270 Harmon		0.26	

Appendix B

ORIGINAL SPRINGBROOK SANITARY DESIGN SHEET

Appendix C-1

Previous Block Population Values

Block	Resident Pop	Employment Pop	Old Population
A	175	0	175
B	76	0	76
C	317	0	317
D	80	10	90
E	103	0	103
F	60	30	90
G	46	0	46
H	96	0	96
I	0	24	24
J	0	20	20
K	175	0	175
Total	1128	84	1212

Appendix C-2 Tertiary Plan Population

BLOCK	Building Number	GF Plate	# Storey	GFA (RES)	GFA (MIX)	1 Bed (61m ²)	2 Bed (80m ²)	3 Bed (114m ²)	Townhouse (140m ²)	Total Units	RES	JOBS	Total PPL+JOBS
A	A1	733	4	2565	N/A	N/A	N/A	N/A	N/A	24	82	0	82
A	A2	489	4	1710	N/A	N/A	N/A	N/A	N/A	16	55	0	55
A	A3	793	4	2775	N/A	N/A	N/A	N/A	N/A	26	89	0	89
A	A4	489	4	1710	N/A	N/A	N/A	N/A	N/A	16	55	0	55
A	A5	733	4	2565	N/A	N/A	N/A	N/A	N/A	24	82	0	82
A	A6	733	4	2565	N/A	N/A	N/A	N/A	N/A	24	82	0	82
A	A7	4068	varies	37512	4068	205	156	110	N/A	471	1314	92	1406
B	Include from Previous										76	0	76
C	B1	1522	12	13949	1522	76	58	41	N/A	175	489	34	523
C	B2	1700	12	14428	1700	79	60	42	N/A	181	505	38	543
C	B6	1446	5	7230	N/A	40	30	21	N/A	91	253	0	253
C	B7	1446	5	7230	N/A	40	30	21	N/A	91	253	0	253
C	B10	1694	5	8470	N/A	46	35	25	N/A	106	297	0	297
C	B11	1694	5	8470	N/A	46	35	25	N/A	106	297	0	297
D	B3	1700	12	14428	1700	79	60	42	N/A	181	505	38	543
D	B4	1700	12	14428	1700	79	60	42	N/A	181	505	38	543
D	B5	1700	12	14428	1700	79	60	42	N/A	181	505	38	543
D	B8	1446	5	7230	N/A	40	30	21	N/A	91	253	0	253
D	B9	1446	5	7230	N/A	40	30	21	N/A	91	253	0	253
E	Include from Previous										103	0	103
F	C1	3405	varies	23716	3405	130	99	69	N/A	298	831	77	908
F	C2	1076	4	3766	N/A	N/A	N/A	N/A	N/A	27	92	0	92
F	C3	1332	4	4662	N/A	N/A	N/A	N/A	N/A	33	114	0	114
F	C4	1076	4	3766	N/A	N/A	N/A	N/A	N/A	27	92	0	92
G	Include from Previous										46	0	46
H	D1	1535	varies	8867	1535	48	37	26	N/A	111	311	35	346
H	D2	1655	12	15755	1655	86	66	46	N/A	198	552	37	589
H	D4	1610	4	5635	N/A	N/A	N/A	N/A	N/A	40	138	0	138
H	D5	1184	4	4144	N/A	N/A	N/A	N/A	N/A	30	101	0	101
I	D3	1934	12	13668	1934	75	57	40	N/A	172	479	44	523
I	E1	2079	varies	11582	2079	63	48	34	N/A	145	406	47	453
J	E2	1991	8	7784	1991	43	32	23	N/A	98	273	45	318
K	Include from Previous										175	0	175
Total											9663	563	10226

Appendix D

Region of Peel Water Modelling Data

Springbrook Settlement Area Growth and Impact to Peel Water System

WATER DEMANDS (MDD)

Description	Juntion ID	Demand 4	Demand 5
Springbrook Block A	J-NEW-6217	10.27	
Springbrook Block B & C	J-NEW-6219	0.43	12.07
Springbrook Block D	J-NEW-6220	11.83	
Springbrook Block E & F	J-NEW-6221	0.58	6.66
Springbrook Block G & K	6586197	0.26	0.98
Springbrook Block H	6508144	6.49	
Springbrook Block I	J-NEW-6222	5.35	
Springbrook Block J	6586196	1.72	
Total MDD		56.64	

SCENARIOS

2021_MDD and 2041_MDD: without and with growth

Note that the existing watermain along Creditview from Queen St to Fallowfield Rd is 150 mm according to our Peel Asset Locator (PAL). However, the Springbrook Servicing Study Update Memo (TYLin, 2022) indicated that partial segment (from Junction #7 to #8, see memo) is a 300mm watermain--which is not the case in PAL. Nevertheless, this latest modelling task assumed that the whole length of watermain from Creditview Rd from Queen St to Fallowfield Rd will be replaced by a 300 mm watermain.

NEAREST LOGGER/S	27 Beacon Hill Dr		
	Range	Ave	
Model Pressure_2021 MDD	46-53 psi		49.3
SCADA Pressure_Dec 7-9, 2022	48-54 psi		51.0
Difference			1.7

MODEL RESULTS

2021 MDD ISOLATION 2041 MDD ISOLATION

AVAILABLE FIREFLOW	2021 MDD+FF	2041 MDD+FF
Description	Available FF, L/s	Available FF, L/s
Springbrook Block A	824	839
Springbrook Block B & C	392	399
Springbrook Block D	148	153
Springbrook Block E & F	739	754
Springbrook Block G & K	1,235	1,275
Springbrook Block H	190	194
Springbrook Block I	767	781
Springbrook Block J	1,232	1,273

PRESSURE AND VELOCITIES

In all scenarios, pressures are above 50 psi while velocities are no greater than 1.0 m/s in the vicinity of Springbrook Settlement Area.

DISCHARGE PRESSURES

In all scenarios, discharge pressures are within the limits at BS Z5, EB Z5, MZV Z5 and WB Z5 pumping stations

CONCLUSIONS:

1. Watermain Diameter:

- The whole length of watermain along Creditview from Queen St to Fallowfield Rd is 150 mm according to PAL but the Springbrook Servicing Update memo assumed that half of the segment was an existing 300 mm watermain
- The whole length of watermain along Creditview from Queen St to Fallowfield Rd is replaced with 300 mm to reflect the memo's assumption.

2. Pressures and Velocities

- There are no concerns with pressures and velocities as well as discharge pressures with the addition of the latest Springbrook Demands (i.e. total of 30.8 MDD)

3. Available Fire Flows

- The available fire flows are greater than the typical 83.3 L/s fire flow for residential units and greater than 250 L/s for ICI units except for Block D and Block--each having less than 250 L/s available fire flow.
- Connection of a development to a 150 mm watermain should be revisited since this watermain would be too small for new connections For example, **Block D** has an available fire flow less than 250 L/s but the required fire flow based on the FUS calculations in the future could be greater. In this case, the 150 mm watermain would be insufficient.
- **Block H** has an available fire flow capacity less than 250 L/s and is recommended to be revisited in case the future required fire flow is higher
- Future FUS calculations based on the details of the development would need to be compared to the simulated fire flow results as shown in the Model Results table.

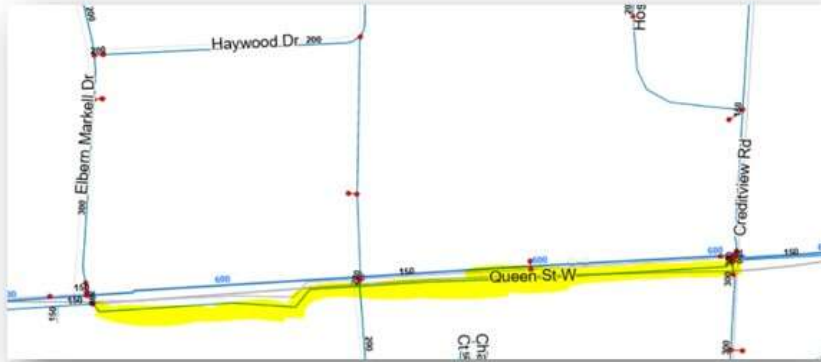
RECOMMENDATIONS:

If the Queen St 150mm (at least from Elbern Markell Dr to Creditview Rd as highlighted in the screenshot) is replaced with 300mm, the available fire flow will improve at Springbrook Block D as shown below:

Available Fire Flow at Block D:

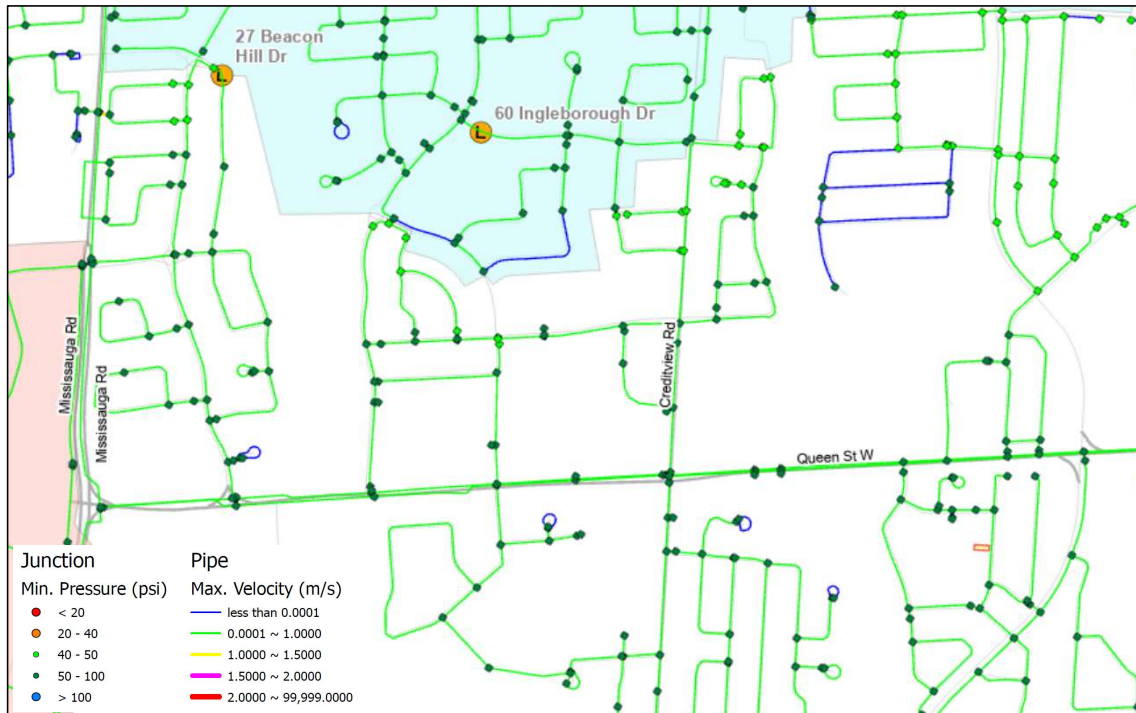
2021 MDD + Growth: 661 L/s

2041 MDD + Growth: 675 L/s

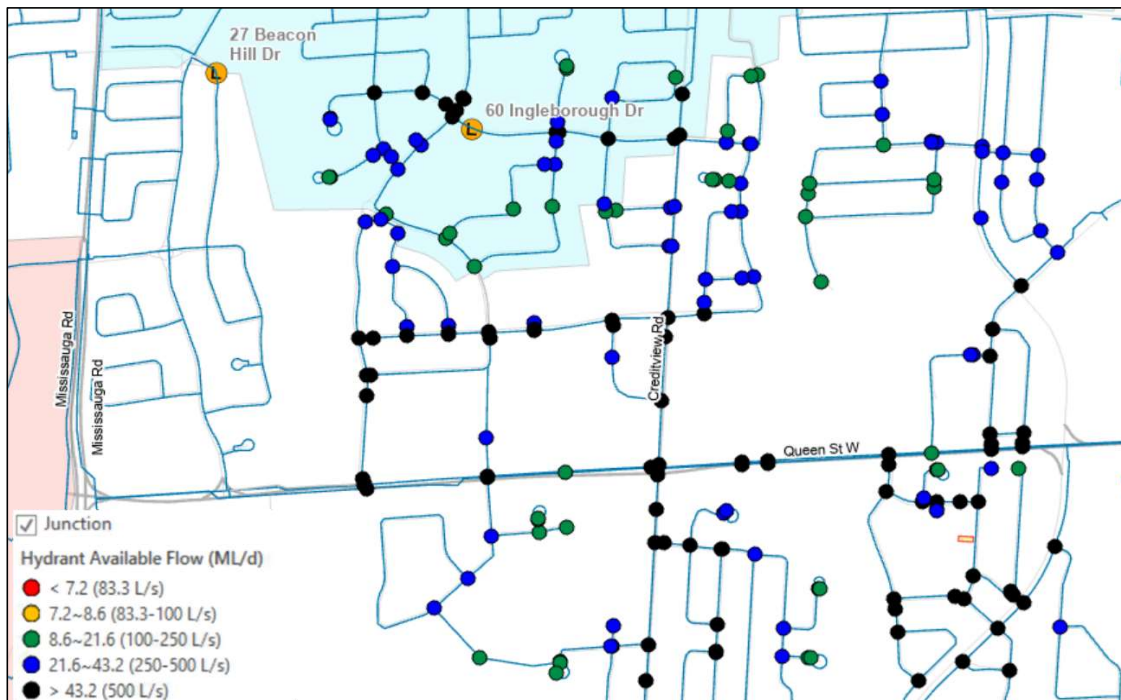


APPENDIX A: MODEL SIMULATIONS IN 2021 MDD

Pressure and Velocities during 2021 MDD + Springbrook Growth

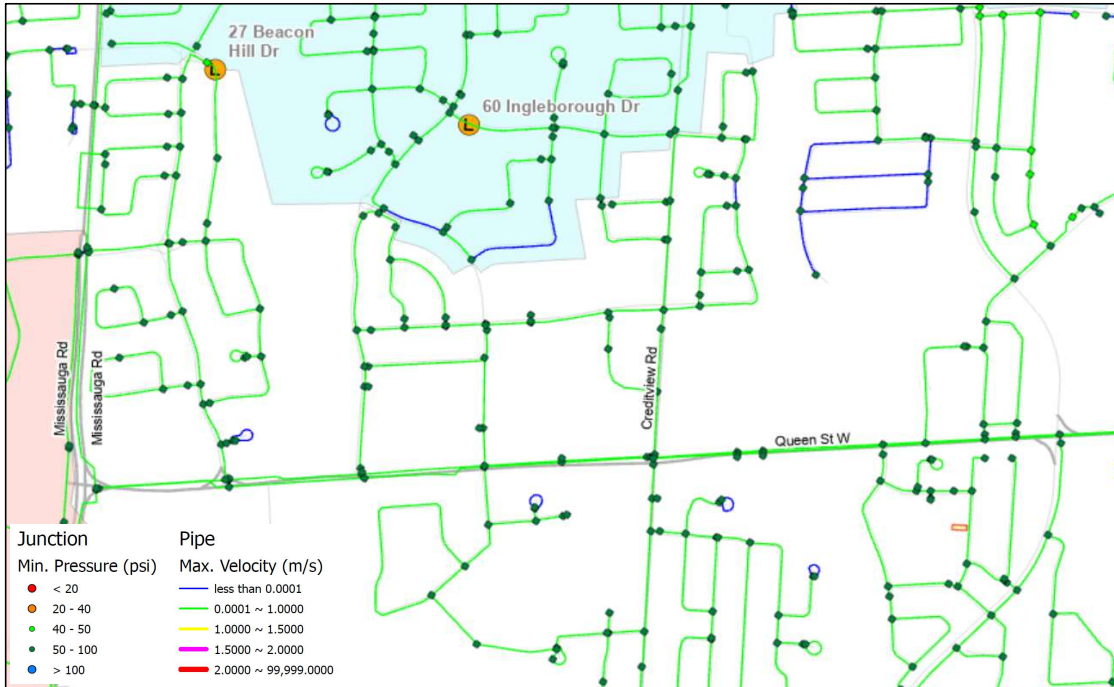


Available Fire Flow during 2021 MDD + Springbrook Growth

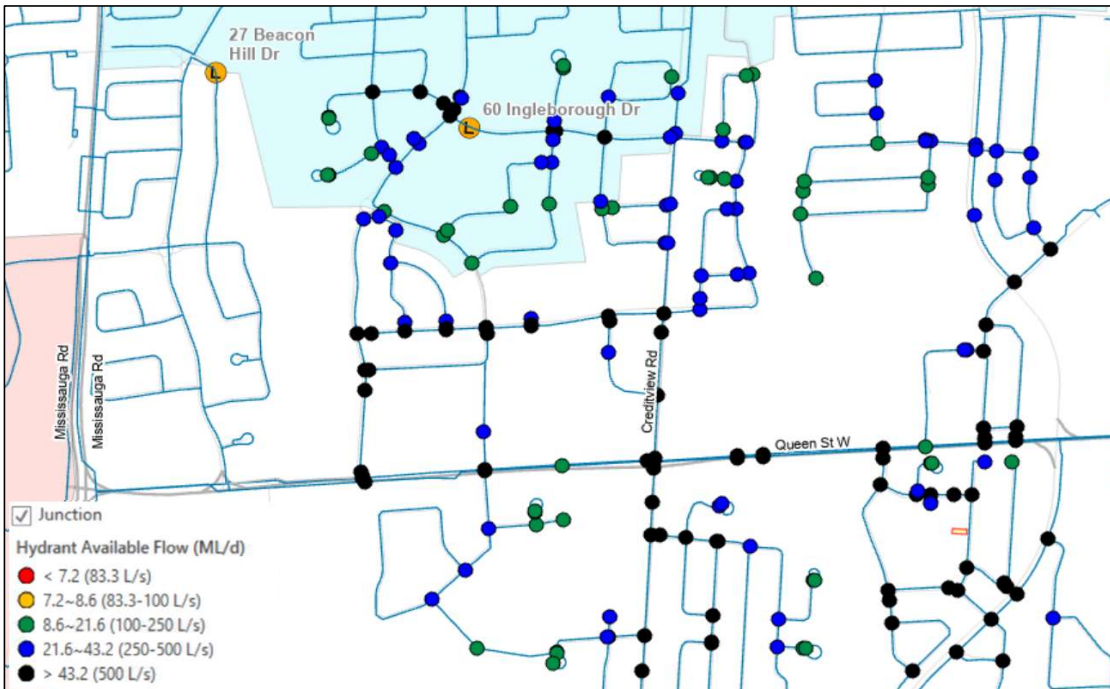


APPENDIX B: MODEL SIMULATIONS IN 2041 MDD

Pressure and Velocities during 2041 MDD + Springbrook Growth



Available Fire Flow during 2041 MDD + Springbrook Growth



Appendix E

Region of Peel Wastewater Modelling Data

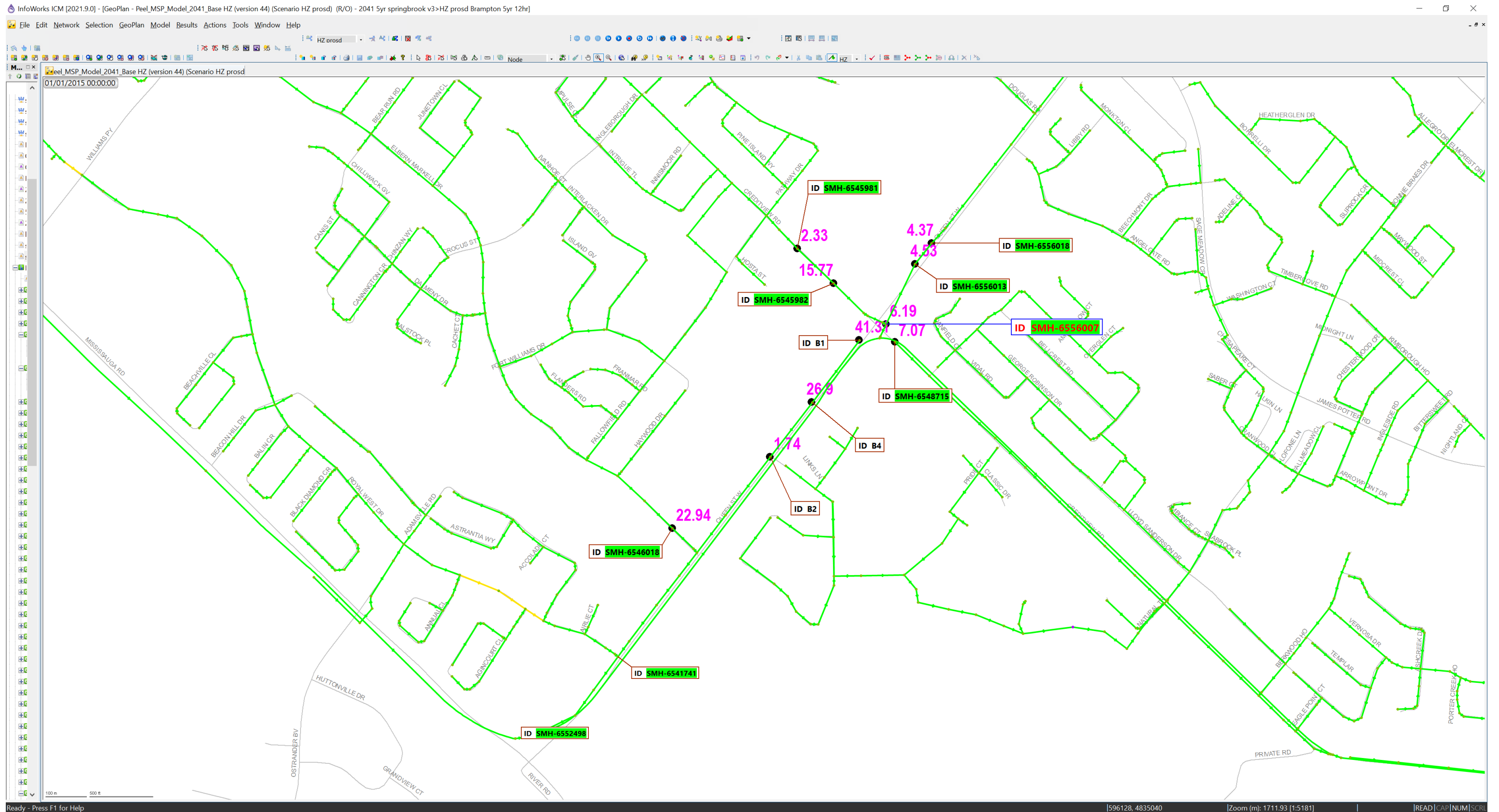


Fig.1 Development flow adding points

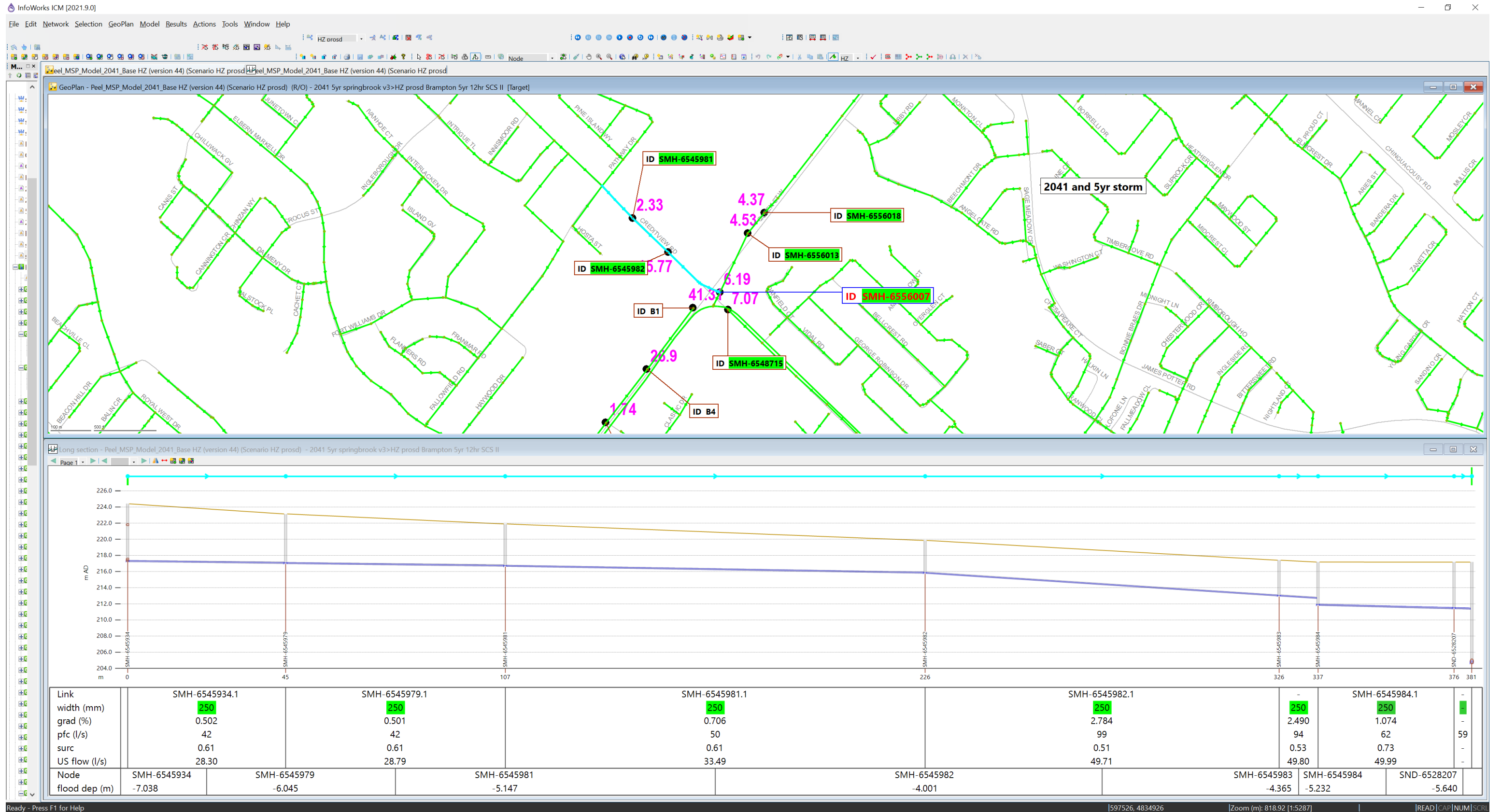


Fig 2. HGL along Creditview Rd

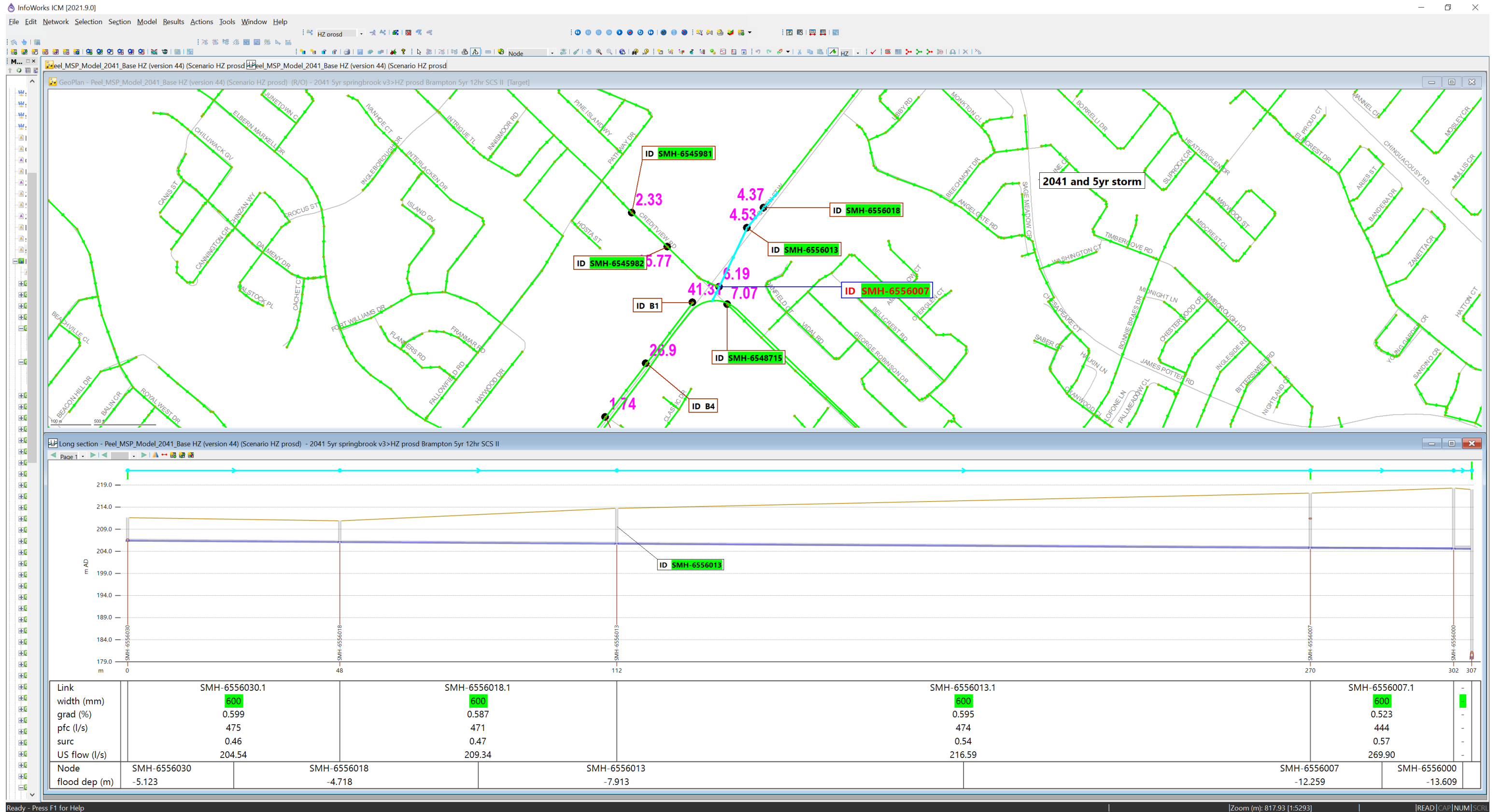


Fig.3 HGL along Queen St W

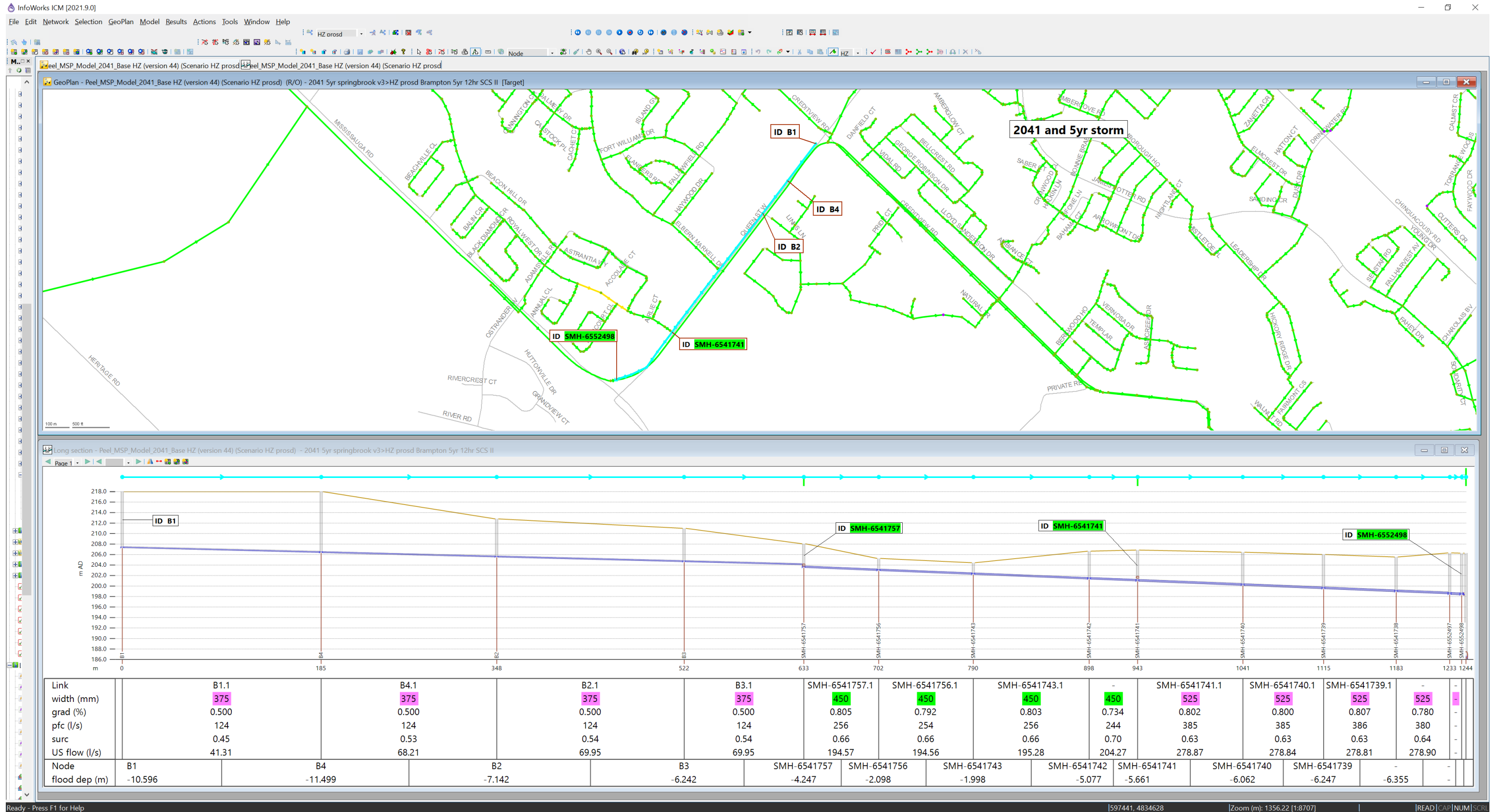
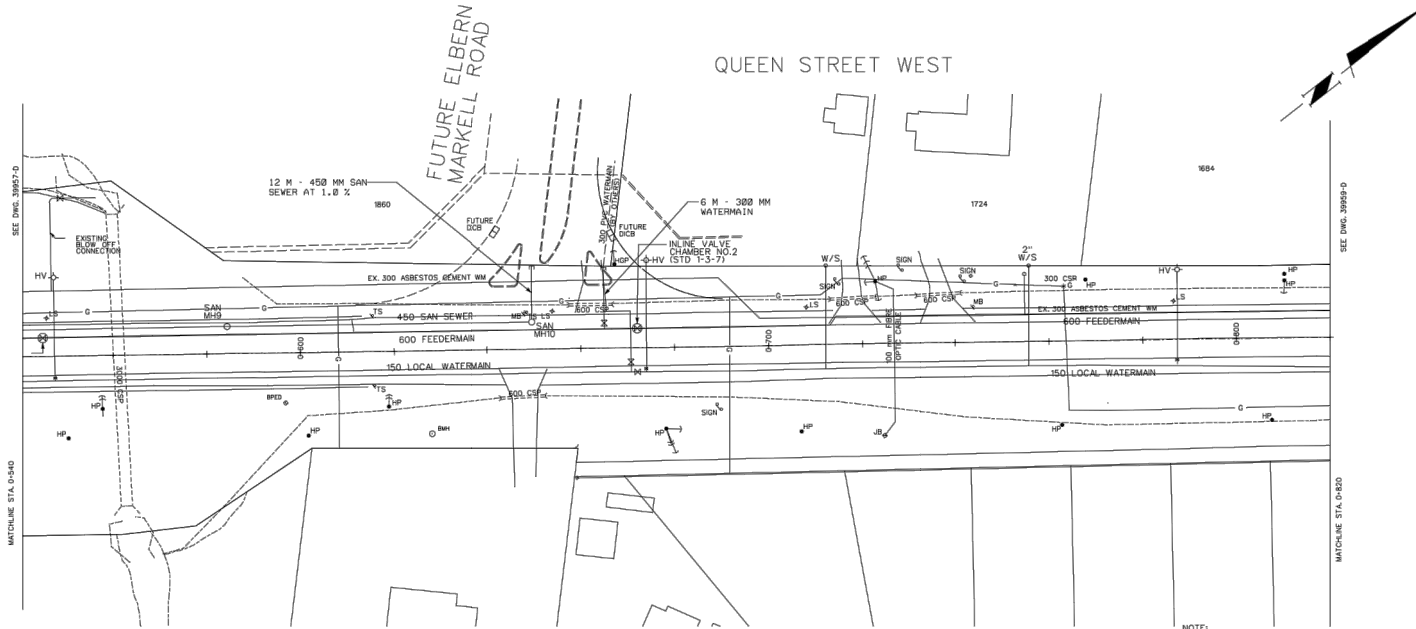


Fig.4 Proposed sewers (pink color)

Appendix F

Conceptual Proposed 375 mm Sewer Along Queen St West

QUEEN STREET WEST



SERVICE DATA					
SERVICE	DATE	INT.	SERVICE	DATE	INT.
SAN SEWERS	DEC. 13/08	PW	GAS MAINS	JAN. 12/07	PW
STONE SEWERS	DEC. 13/08	PW	BELL UFS CABLE	FEB. 5/07	PW
WATERMANS	DEC. 13/08	PW	HYDRO UFS CABLE	FEB. 5/07	PW
TRANSIT			HYDRO ONE	FEB. 5/07	PW
PARCEL & REC.			CLV	JAN. 18/07	PW
INT. CLEAR WATER	DEC. 13/08	PW	COMMING CABLES	FEB. 5/07	PW

REVISIONS		
DATE	DETAILS	INT.
07/22/08	ISSUED AS PER ADDENDUM No.1	H.H.T.
09/02/08	ISSUED FOR CONSTRUCTION	H.H.T.
09/23/08	CONNECTION OF FUTURE 300 WM LOCATION REVISED	H.H.T.
09/23/08	AS BUILT	H.H.T.



THIS DRAWING TO BE USED FOR WATERMANS AND SANITARY SEWER CONSTRUCTION ONLY

- General Notes**
- All Elevations ASPHALT Unless Otherwise Noted.
 - All Service Locations Are Approximate And Must Be Located Accurately In The Field
 - denotes Building - Not Located
 - ⊙ denotes Building Located
 - Type 'B' Bedding Unless Otherwise Noted (S&M)

S.M. No. B3-216 Elev. 210.875 m
 The Contractor is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction. Location of Existing Utilities Approximate Only, To Be Verified In Field By Contractor.

AECOM

AECOM Canada Ltd.
 300 Water Street, Windsor, Ontario, Canada L1N 8S2
 1905.868.0389 1905.468.0221

Designed by: *Chad* Approved by: _____

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING:

THE REGIONAL MUNICIPALITY OF PEEL	CABLE TELEVISION/BROADCAST PROVIDERS
CITY OF MISSISSAUGA WORKS DEPT.	BELL CANADA
CITY OF BRAMPTON WORKS DEPT.	INDUSOURCE TELCOM
TOWN OF CALEDON WORKS DEPT.	HYDRO ONE TELECOM
BELL CANADA	RODERS CABLE
ENBRIDGE INCORPORATED-GAS DISTRIBUTION	ALLSTREAM
CANADIAN MINISTRY OF TRANSPORTATION	PW (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	FUTUREVIEW (FCIBRABAND)
HYDRO ONE NETWORKS	
ENERGYSOURCE/HYDRO MISSISSAUGA	
HYDRO ONE BRAMPTON	

10m 0 10 20 30m HORIZONTAL SCALE
 0 1 2 3m VERTICAL SCALE

Region of Peel
 Working for you

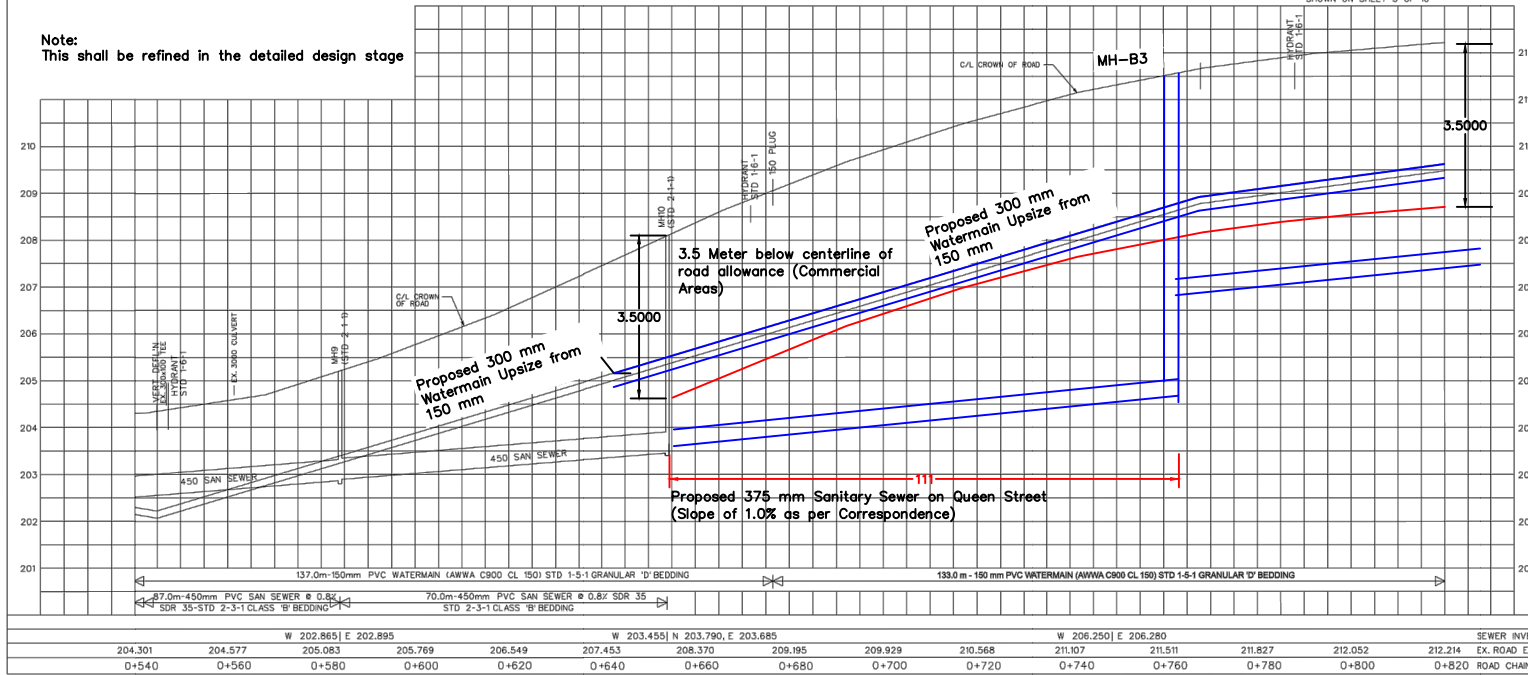
QUEEN STREET WEST
 (FROM MISSISSAUGA RD. TO CREDITVIEW RD.)

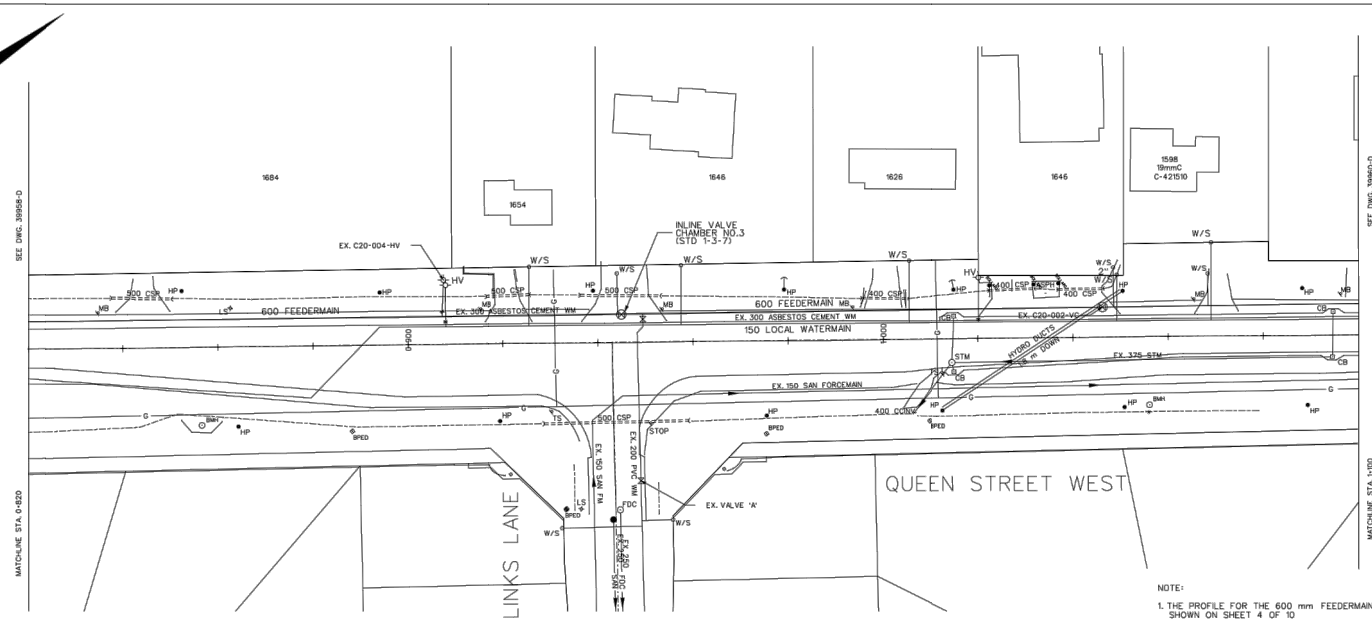
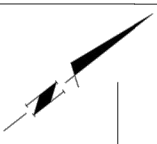
Proposed 375 mm Sanitary Sewer and 300 mm Watermain Upsize

STA. 0+540	TO STA. 0+820
CAD Area	Area B-15/B-24
Project No.	07-114.7 & 08-2150
Checked by J.H.T.	Drawn by J.G.
Date JUNE 2008	Sheet 8 of 10
	Plan No. 39958-D

Note:
 This shall be refined in the detailed design stage

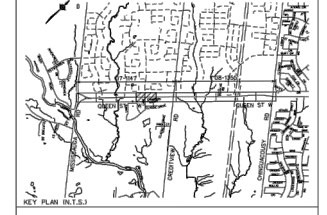
NOTE:
 1. THE PROFILE FOR THE 600 mm FEEDERMAN IS SHOWN ON SHEET 3 OF 10





SERVICE DATA					
SERVICE	DATE	INT.	SERVICE	DATE	INT.
SAN SEWERS	DEC. 3/08	PW	GAS MAINS	JAN. 31/07	PW
STORM SEWERS	DEC. 3/08	PW	BELL U/G CABLE	FEB. 5/07	PW
WATERMANS	DEC. 3/08	PW	HYDRO U/G CABLE	FEB. 5/07	PW
TRANS.			HYDRO O/G		
PARKS & RECR.			CTV	JAN. 9/07	PW
DET. CLEAN WATER	DEC. 1/08	PW	COMM. CABLES	FEB. 5/07	PW

REVISIONS		
DATE	ISSUED AS PER	DETAILS
07/27/08	ISSUED AS PER	ADDENDUM No.1
09/02/08	ISSUED FOR CONSTRUCTION	J.H.T.
08/27/09	AS-BUILT	J.H.T.



THIS DRAWING TO BE USED FOR WATERMANS AND SANITARY SEWER CONSTRUCTION ONLY

- General Notes**
- All Driveways ASPHALT Unless Otherwise Noted.
 - All Service Locations are Approximate and must be Located Accurately in The Field
 - ⊙ Denotes Building - Not Located
 - ⊙ Denotes Building Located
 - Type 'W' Bending Unless Otherwise Noted (S&W)

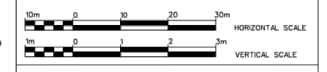
B.M. No. 85-215 Elev. 210.875 m
 The Contractor is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction Location of Existing Utilities Approximate Only, To Be Verified in Field by Contractor.



AECOM Canada Ltd.
 800 West Street, Whiteby, Ontario, Canada L1N 9S1
 (905) 884-8888 (FAX) (905) 884-0021

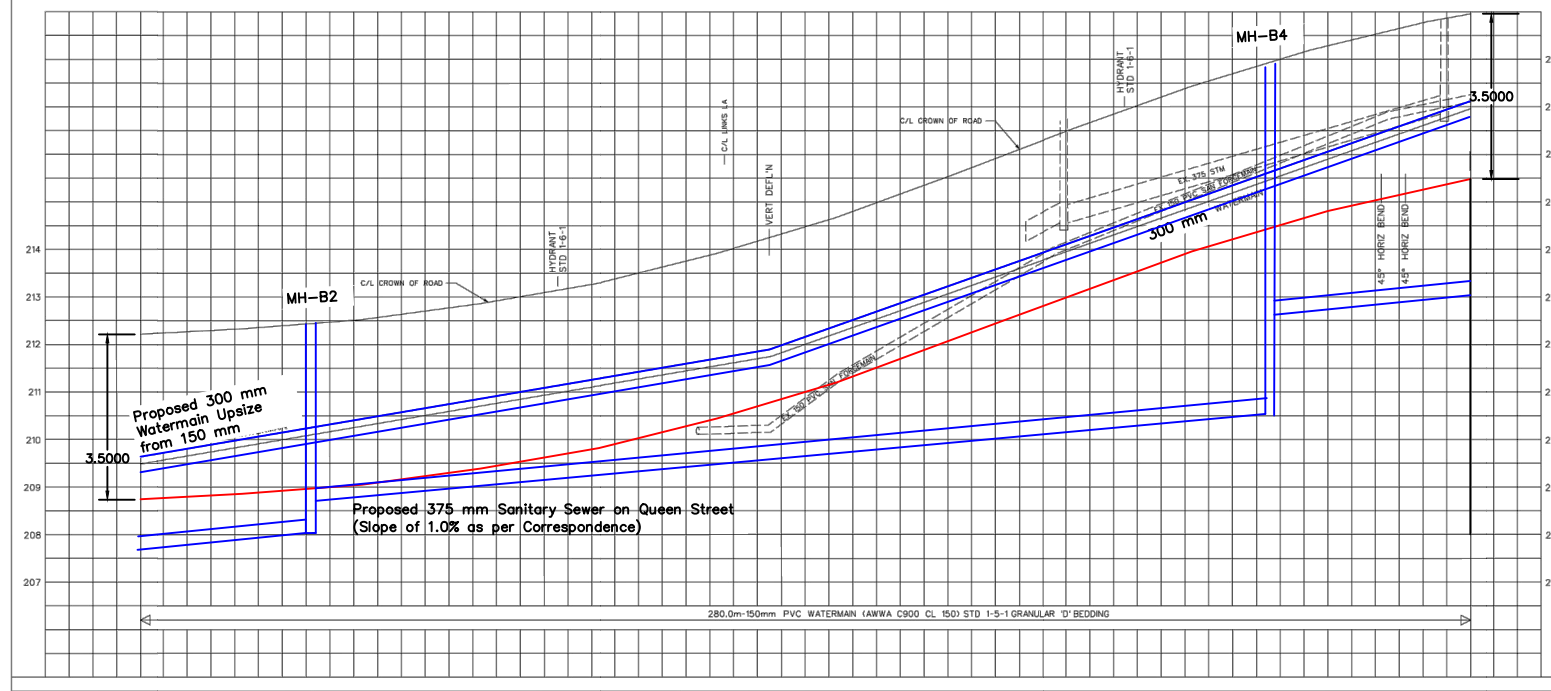
Designed by: [Signature] Approved by: [Signature]

- NOTICE TO CONTRACTOR**
 48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING
- | | |
|---|--------------------------------------|
| THE REGIONAL MUNICIPALITY OF PEEL | CABLE TELEVISION/FIBROPTIC PROVIDERS |
| CITY OF MISSISSAUGA WORKS DEPT. | BELL CANADA |
| CITY OF BRAMPTON WORKS DEPT. | ENERGISELEC TELECOM |
| TOWN OF CALEDON WORKS DEPT. | HYDRO ONE TELECOM |
| BELL CANADA | ROGERS CABLE |
| ENERGISELEC INCORPORATED-GAS DISTRIBUTION | ALLSTREAM |
| ONTARIO MINISTRY OF TRANSPORTATION | FOR PUBLIC SECTOR NETWORK |
| ONTARIO CLEAN WATER AGENCY | FUTUREWAY (FIBROPTIC) |
| HYDRO ONE NETWORKS | |
| ENERGISELEC HYDRO MISSISSAUGA | |
| HYDRO ONE BRAMPTON | |



QUEEN STREET WEST
 (FROM MISSISSAUGA RD. TO CREDITVIEW RD.)
Proposed 375 mm Sanitary Sewer and 300 mm Watermain Upsize

STA. 0+820	TO STA. 1+100
CAD Area	Area B-15/B-24
Checked by J.H.T.	Drawn by J.G.
Date JUNE 2008	Sheet 9 of 10
Project No. 07-1147	Plan No. 39959-D



STATION	W 207.885 E 207.915	W 209.258 E 209.278 S 209.590	SEWER INVERT	CAD Area	Area B-15/B-24	Project No. 07-1147												
212.214	212.321	212.473	212.706	213.010	213.385	213.889	214.485	215.178	215.927	216.683	217.401	218.021	218.548	218.978	EX. ROAD ELEV.	Checked by J.H.T.	Drawn by J.G.	Project No. 07-1147
0+820	0+840	0+860	0+880	0+900	0+920	0+940	0+960	0+980	1+000	1+020	1+040	1+060	1+080	1+100	ROAD CHANGE	Date JUNE 2008	Sheet 9 of 10	Plan No. 39959-D

Appendix G

Conceptual Proposed 525 mm Upsize of the 450 mm Sewer Along Queen St West

REGION OF PEEL																
TY Lin. 8800 Dufferin Street Suite 200, Vaughan L4K 0C5 905-738-5700		INFRASTRUCTURE PLANNING, GROWTH & WATER RESOURCES - PUBLIC WORKS DIVISION										PREPARED BY: <u>JA</u>				
		SANITARY SEWER DESIGN										CHECKED BY: <u>KB</u>				
		Conceptual Design of Queen St Upsizing SPRINGBROOK										DATE: <u>2023-04-03</u>				
												FILE NO:				
		TOTAL FLOWS	PIPE DESIGN													
Upstream Manhole	Downstream Manhole	Cumulative Design Flow (L/s) From Region Provided Modelling Results 2023	Pipe Size (mm)	Upstream Invert	Downstream Invert	Upstream Obvert	Downstream Obvert	Grade (%)	Capacity (l/s)	Velocity (m/s)	Drop (m)	Length (m)	Data Source for Length	Actual Velocity (m/s)	% Capacity	
B1	B4	41.3	375	214.035	212.185	214.41	212.56	1.00	182.9	1.60	1.39	185.0	Modelling Data	1.30	23%	
B4	B2	68.2	375	210.795	209.165	211.17	209.54	1.00	182.9	1.60	1.39	163.0	Modelling Data	1.49	37%	
B2	B3	70.0	375	207.775	206.035	208.15	206.41	1.00	182.9	1.60	1.39	174.0	Modelling Data	1.50	38%	
B3	6541757	70.0	375	204.645	203.535	205.02	203.91	1.00	182.9	1.60	1.39	111.0	Modelling Data	1.50	38%	
6541757	6541756	194.6	450	203.46	202.90	203.91	203.35	0.80	266.9	1.63	0.03	69.6	EPAL	1.77	73%	
6541756	6541743	194.6	450	202.87	202.17	203.32	202.62	0.80	265.4	1.62	0.03	87.9	EPAL	1.77	73%	
6541743	6541742	195.3	450	202.14	201.28	202.59	201.73	0.80	265.9	1.62	0.03	107.6	EPAL	1.77	73%	
6541742	6541741	204.3	450	201.25	200.91	201.70	201.360	0.76	258.6	1.58	0.03	45.0	EPAL	1.75	79%	
6541741	6541740	278.9	525	200.84	200.07	201.360	200.60	0.78	379.8	1.75	0.04	97.8	EPAL	1.92	73%	
6541740	6541739	278.8	525	200.03	199.44	200.56	199.97	0.79	398.8	1.78	0.04	75.0	EPAL	1.93	70%	
6541739	6541738	278.8	525	199.40	198.87	199.93	199.39	0.79	398.8	1.78	0.04	67.5	EPAL	1.93	70%	
6541738	6552497	278.9	525	198.83	198.44	199.35	198.97	0.79	382.2	1.77	0.04	48.6	EPAL	1.93	73%	
6552497	6552498	278.9	525	198.40	198.32	198.93	198.84	0.79	382.2	1.77	0.04	11.1	EPAL	1.93	73%	
6552498	6552499	278.9	600	198.24	198.2	198.84	198.80	1.00	640.6	2.19	0.06	4.0	EPAL	0.00	44%	
Pre-Draft Plan Lands Detached, Semidetached, and Townhouse Mix = 50 person/ha Apartment = 475 person/ha Post-Draft Plan Lands Single & Semi Detached (Type A) = 3.8 persons/unit Townhouses (Type B) = 3.5 persons/unit Apartment (Type C) = 2.16 persons/unit		Assumptions:														
		Based on the invert at the existing 600mm diameter sewer and tying upstream into the green obvert.														
		Vertical profile can be optimised during detailed design.														
		Cumulative Design Flow (l/s) are based on Region Provided Modelling Results as of 2023 - 03 - 27														
		Drop between SMH-6541741 - SMH-6552498 are based on Velocity Head formula as per Region of Peel Design Criteria manual.														
					April 2023		JA								DATE: 45019	
		REVISION			DATE		AUTH								SAN 1	
REGION OF PEEL INFRASTRUCTURE PLANNING, GROWTH & WATER RESOURCES PUBLIC WORKS DIVISION SANITARY SEWER DESIGN SHEET 1																

MISSISSAUGA ROAD

QUEEN STREET

SERVICE DATA					
SERVICE	DATE	INT.	SERVICE	DATE	INT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/F CABLE		
WATERMANS			HYDRO U/F CABLE		
TRANSIT			HYDRO ONE		
PARKS & REC.			CTV		
ONLY CLEAN WATER			COMMUNIC. CABLES		

REVISIONS		
DATE	DETAILS	INT.
MAY 2015	AS-BUILT DRAWINGS	CBH

KEY PLAN (INT. 5.3)

AS-BUILT DRAWING

These As-Built Drawings have been prepared based on inspections and observations undertaken during key stages of construction and on information submitted by other parties. They have been prepared to show systems as installed. While this information is believed to be reliable, MMM is not responsible for its accuracy or for errors or omissions that may have been incorporated into this drawing as a result.

General Notes

- All Driveways ASPHALT Unless Otherwise Noted.
- - - All Service Locations Are Approximate And Must Be Located Accurately In The Field
- ⊙ Denotes Building - Not Located
- ⊙ Denotes Building Located
- Type 'B' Bedding Unless Otherwise Noted (S&O)

Rev. No. _____
 Date _____

The Contractor is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction. Location of Existing Utilities Approximate Only. To Be Verified In Field By Contractor.

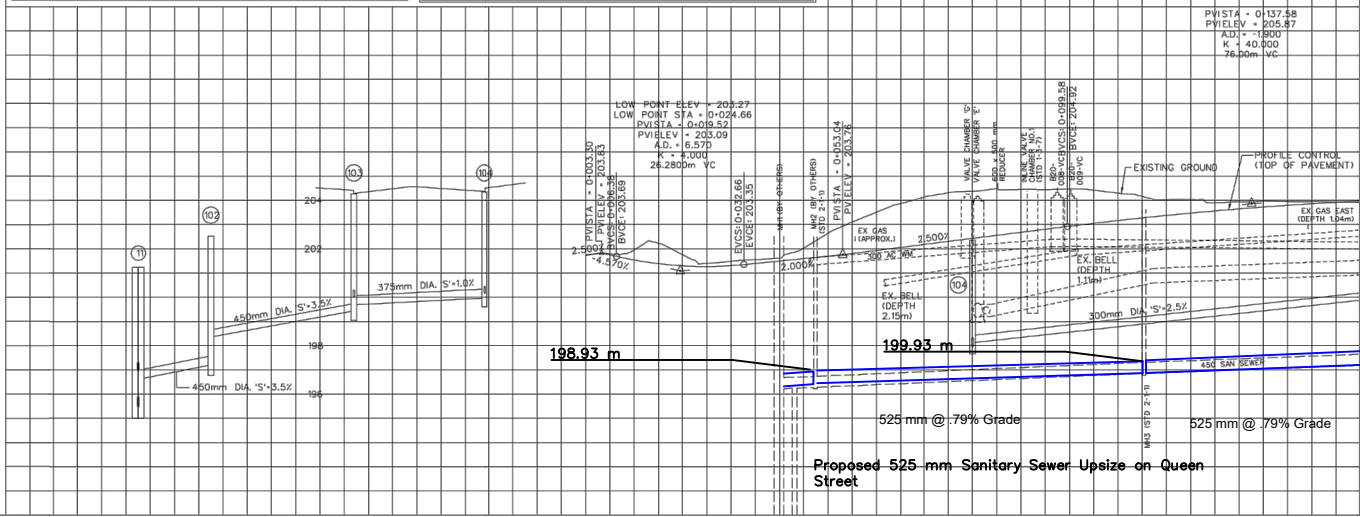
Note:
 This shall be refined in the detailed design stage

THESE DESIGN DOCUMENTS ARE PREPARED SOLELY FOR THE USE BY THE PARTY WITH WHOM THE DESIGN PROFESSIONAL HAS ENTERED INTO A CONTRACT AND THERE ARE NO REPRESENTATIONS OF ANY KIND MADE BY THE DESIGN PROFESSIONAL TO ANY PARTY WITH WHOM THE DESIGN PROFESSIONAL HAS NOT ENTERED INTO A CONTRACT.

THE LOCATION OF UTILITIES IS APPROXIMATE ONLY AND THE EXACT LOCATION SHOULD BE DETERMINED BY CONSULTING THE MUNICIPAL AUTHORITIES AND UTILITY COMPANIES CONCERNED. THE CONTRACTOR SHALL PROVE THE LOCATION OF UTILITIES AND SHALL BE RESPONSIBLE FOR ADEQUATE PROTECTION FROM DAMAGE.

MAINTENANCE HOLE & CATCHBASIN DATA						
NO.	STA.	OFFSET	TYPE		ELEVATION	
			STRUCTURE	COVER	GRATE	LOW INV.
106	0+161	9.50m LT	701.010	400.100	205.750	201.820
104	0+080	10.62m LT	703.021	400.081	202.225	199.835
103	0+080	14.77m RT	701.010	400.081	204.106	199.048
102	0+980.83	28.61m RT	701.010	401.010	202.522	197.182
11	0+946.31	16.75m LT	703.021	400.081	201.227	195.457

SEWER DATA									
FROM	TO	SIZE	LENGTH	CLASS	BEDDING	BACKFILL	INVERTS		
							OUTLET	INLET	INLET
106	104	300	81.00	CL3	B	G	201.820	200.200	200.200
104	103	375	27.00	CL3	B	G	199.835	199.589	199.589
103	102	450	29.50	CL3	B	G	199.046	198.144	198.144
102	11	450	15.00	CL3	B	G	197.182	196.657	196.657



Proposed 525 mm Sanitary Sewer Upsize on Queen Street

Designed by _____
 Checked _____
 Approved by _____

The MUNICIPAL INFRASTRUCTURE Group Ltd.
 8890 Dufferin Street, Suite 200
 Vaughan, Ontario, L4R 1C3
 Tel. 905-738-5700 Fax 905-738-0065

MMM GROUP

NOTICE TO CONTRACTOR
 48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING:

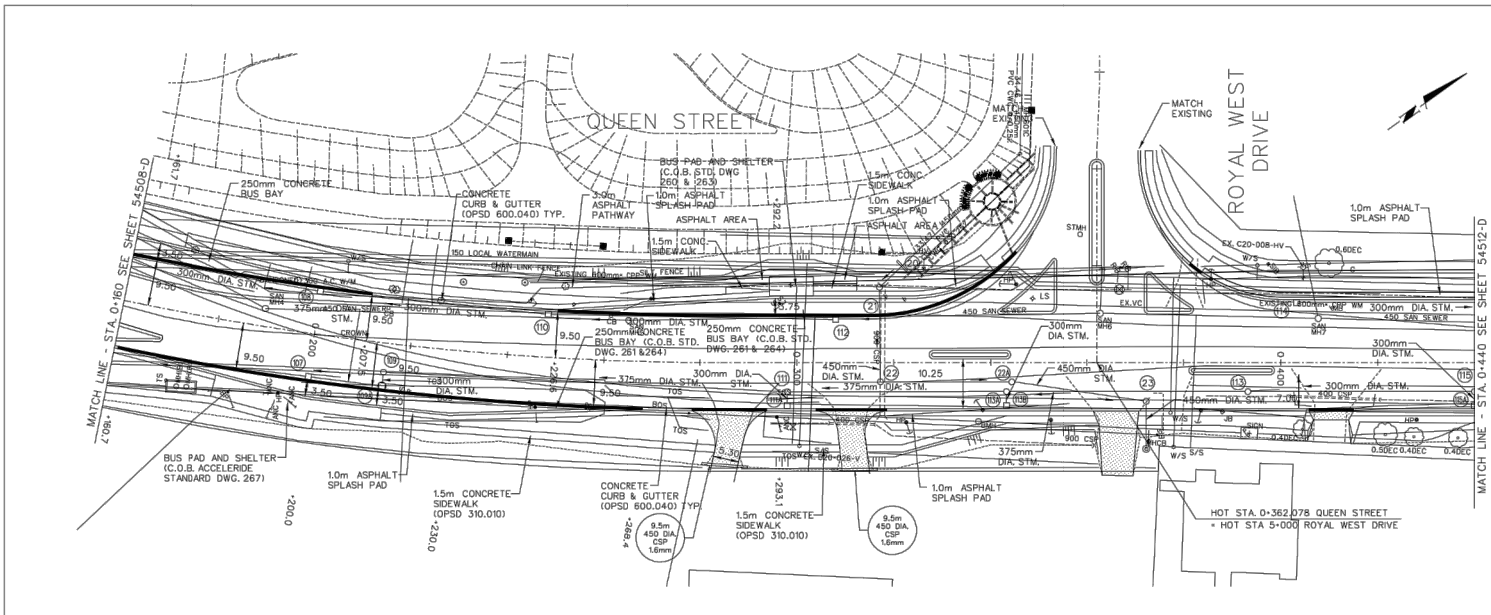
THE REGIONAL MUNICIPALITY OF PEEL	CABLE TELEVISION/FIBRE/OPTIC PROVIDERS
CITY OF MISSISSAUGA WORKS DEPT.	BELL CANADA
CITY OF BRAMPTON WORKS DEPT.	ENERGYSCOPE TELECOM
TOWN OF CALEDON WORKS DEPT.	HYDRO ONE TELECOM
BELL CANADA	ROGERS CABLE
ENERGYSCOPE INCORPORATED-GAS DISTRIBUTION	ALLIANCE
ONTARIO MINISTRY OF TRANSPORTATION	FTS (PUBLIC SECTOR NETWORK)
ONTARIO CLEAN WATER AGENCY	HYDRO ONE NETWORKS
HYDRO ONE NETWORKS	FIBRE (PUBLIC SECTOR NETWORK)
ENERGYSCOPE, HYDRO MISSISSAUGA	FUTUREWAY (FIBRE/DOCSIS)
HYDRO ONE BRAMPTON	

10m 0 10 20 30m HORIZONTAL SCALE
 0 2 4 6 8 10m VERTICAL SCALE

Region of Peel
 Working for you

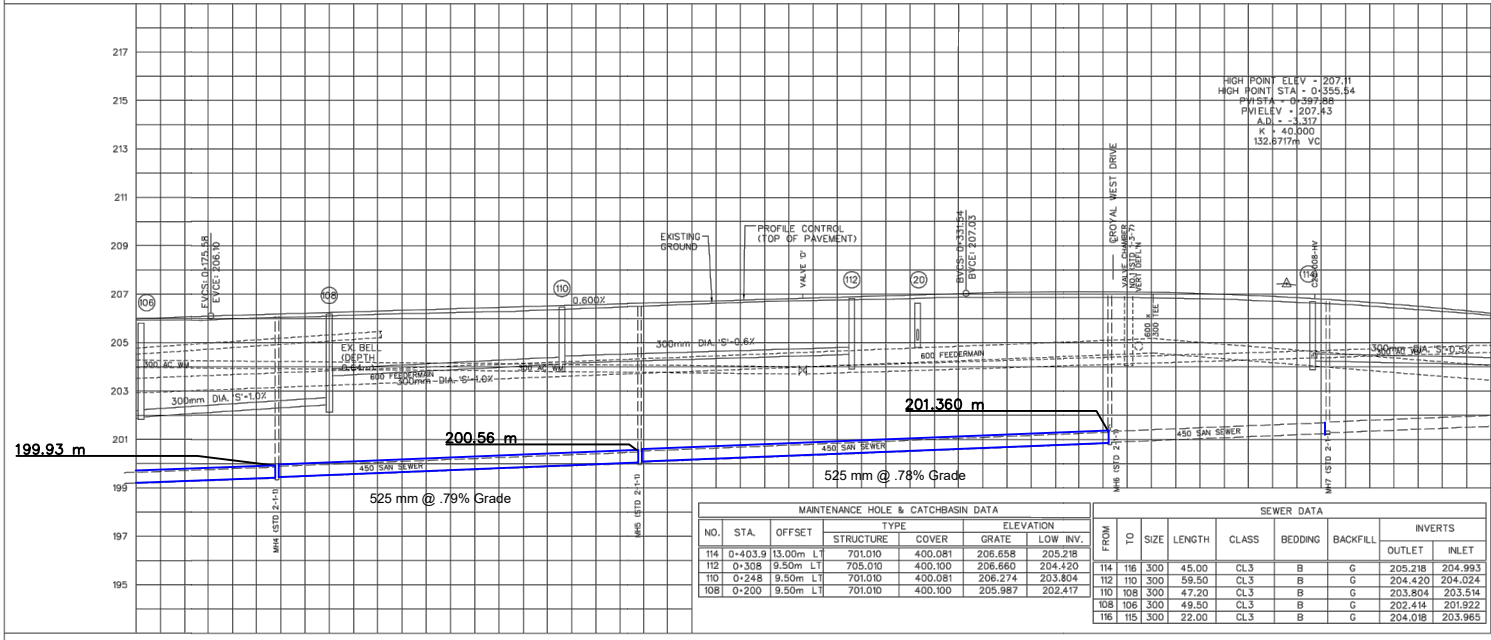
MISSISSAUGA ROAD
 (FROM QUEEN STREET TO WILLIAMS PARKWAY)

Proposed 525 mm Sanitary Sewer Upsize



THESE DESIGN DOCUMENTS ARE PREPARED SOLELY FOR THE USE BY THE PARTY WITH WHOM THE DESIGN PROFESSIONAL HAS ENTERED INTO A CONTRACT AND THERE ARE NO REPRESENTATIONS OF ANY KIND MADE BY THE DESIGN PROFESSIONAL TO ANY PARTY WITH WHOM THE DESIGN PROFESSIONAL HAS NOT ENTERED INTO A CONTRACT.

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NO.	STA.	OFFSET	STRUCTURE	COVER	GRATE	ELEVATION	LOW INV.
114	0+403.9	13.00m LT	701.010	400.081	206.658	205.298	
112	0+308	9.50m LT	705.010	400.100	206.660	204.420	
110	0+248	9.50m LT	701.010	400.081	206.274	203.804	
108	0+200	9.50m LT	701.010	400.100	205.987	202.417	

FROM	TO	SIZE	LENGTH	CLASS	BEDDING	BACKFILL	INVERTS
114	116	300	45.00	CL3	B	G	205.218 204.993
112	110	300	59.50	CL3	B	G	204.420 204.024
110	108	300	47.20	CL3	B	G	203.804 203.514
108	106	300	49.50	CL3	B	G	202.414 201.922
116	115	300	22.00	CL3	B	G	204.018 203.965

SERVICE	DATE	INT.	SERVICE	DATE	INT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL UFG CABLE		
WATERMANS			HYDRO UFG CABLE		
TRANSIT			HYDRO ONE		
PAVKS & REC.			CTV		
ONT. CLEAN WATER			COMMUNIC. CABLES		

DATE	AS-BUILT DRAWINGS	DETAILS	INT.
MAY 2015			CBH



AS-BUILT DRAWING

These As-Built Drawings have been prepared based on inspections and observations undertaken during key stages of construction and on information submitted by others. They have been revised to show systems as installed. While this information is believed to be reliable, MMM is not responsible for its accuracy or for errors or omissions that may have been incorporated into this drawing as a result.

General Notes

- All Driveways ASPHALT Unless Otherwise Noted.
- All Service Locations Are Approximate And Must Be Located Accurately In The Field
- Denotes Building - Not Located
- Denotes Building Located
- Type "B" Bidding Unless Otherwise Noted

B.M. No. Elev.
The Contractor is Responsible For Locating And Protecting All Existing Utilities Prior To And During Construction. Location of Existing Utilities Approximate Only To Be Verified In Field By Contractor.

Designed by _____ Approved by _____

The MUNICIPAL INFRASTRUCTURE Group Ltd.
 8810 Durbin Street, Suite 200
 Vaughan, Ontario, L4K 0C5
 Tel. 905-738-5700 Fax. 905-738-0065

MMM GROUP

NOTICE TO CONTRACTOR

48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING THE REGIONAL MUNICIPALITY OF PEEL CABLE TELEVISION/REPTIC PROVINCES CITY OF MISSISSAUGA WORKS DEPT. ENERGIQUE TELECOM HYDRO ONE TELCOM BELL CANADA BELL CANADA ALSTRIAM ROGERS CABLE ENERGIQUE INCORPORATED-GAS DISTRIBUTION ONTARIO MINISTRY OF TRANSPORTATION ONTARIO CLEAN WATER AGENCY HYDRO ONE NETWORKS ENERGIQUE HYDRO MISSISSAUGA HYDRO ONE BRAMPTON

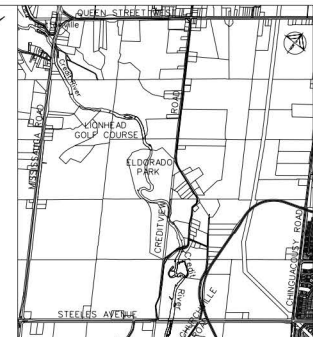
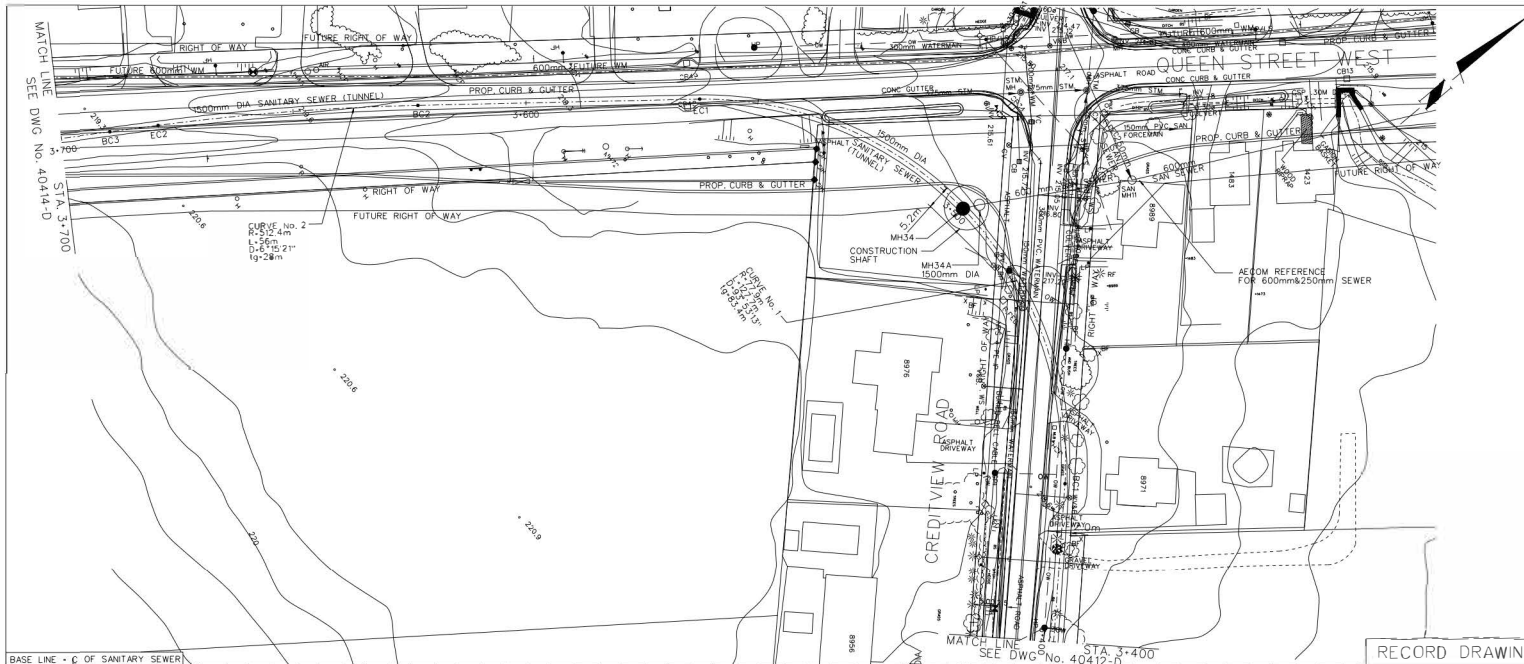


Region of Peel
Working for you

MISSISSAUGA ROAD
(FROM QUEEN STREET TO WILLIAMS PARKWAY)
Proposed 525 mm Sanitary Sewer Upsize

Appendix H

“Proposed (Alternative 2) Sanitary Sewer Obverts”



KEY PLAN - N.T.S.

SERVICE DATA					
SERVICE	DATE	INT.	SERVICE	DATE	INT.
SAN SEWERS			GAS MAINS		
STORM SEWERS			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANS.			INT. HYDRO		
PARKS & REC.			CITY		
DRY. CLEAN WATER					

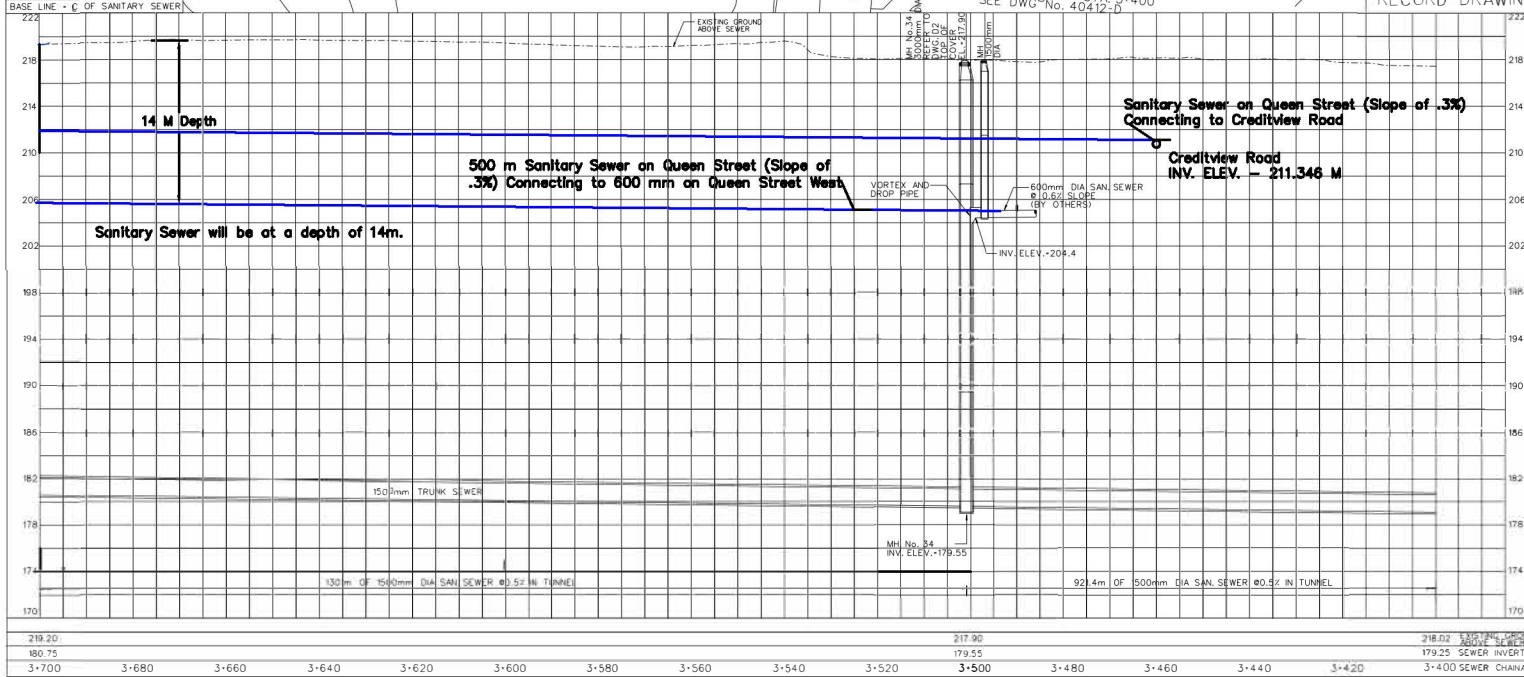
REVISIONS		
DATE	DETAILS	INT.
MAY 2008	ISSUED FOR TENDER	CS
SEP 2008	ISSUED FOR CONSTRUCTION	CS
DEC 2011	AS CONSTRUCTED	CS

General Notes

- ALL DRIVEWAYS ASPHALT UNLESS OTHERWISE NOTED
- ALL SERVICE LOCATIONS ARE APPROXIMATE AND MUST BE LOCATED ACCURATELY IN THE FIELD
- ⊗ DENOTES BUILDING - NOT LOCATED
- ⊕ DENOTES BUILDING LOCATED

NATED 15/01/11

CITY OF BRAMPTON B.M. No. 02-97 ELEV. 232.897 M
 RED BRICK BUILDING ON NORTHWEST CORNER OF QUEEN STREET WEST
 AND CHEMUNOUDY ROAD TABLETS IN SOUTH FACE 0.45M WEST OF
 SOUTHWEST CORNER 1.5M ABOVE GROUND
 THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING ALL
 EXISTING UTILITIES PRIOR TO ANY DURING CONSTRUCTION
 LOCATION OF TRENCH UTILITIES APPROXIMATE ONLY TO BE VERIFIED IN FIELD
 BY CONTRACTOR



600 Cathrine Drive, Suite 500, Markham, ON L3R 5K3
 Telephone: (905) 475-7270 / Fax: (905) 475-5994

ORIGINALLY STAMPED
 By C.G. STEPHEN
 ON SEPT 18, 2008

DESIGNED BY: [Signature] APPROVED BY: [Signature]

NOTICE TO CONTRACTOR

8 HOURS PRIOR TO COMMENCING WORK, NOTIFY THE FOLLOWING:

THE REGIONAL MUNICIPALITY OF PEELE
 CITY OF BRAMPTON WORKS DEPT
 BELL TELEPHONE COMPANY
 CONSUMERS GAS COMPANY
 HYDRO ELECTRIC - SERVICE CO. OF ONTARIO
 HYDRO ELECTRIC - CDWV CITY OF BRAMPTON
 CABLE TELEVISION

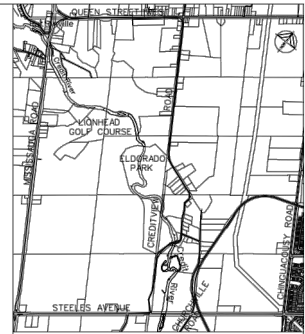
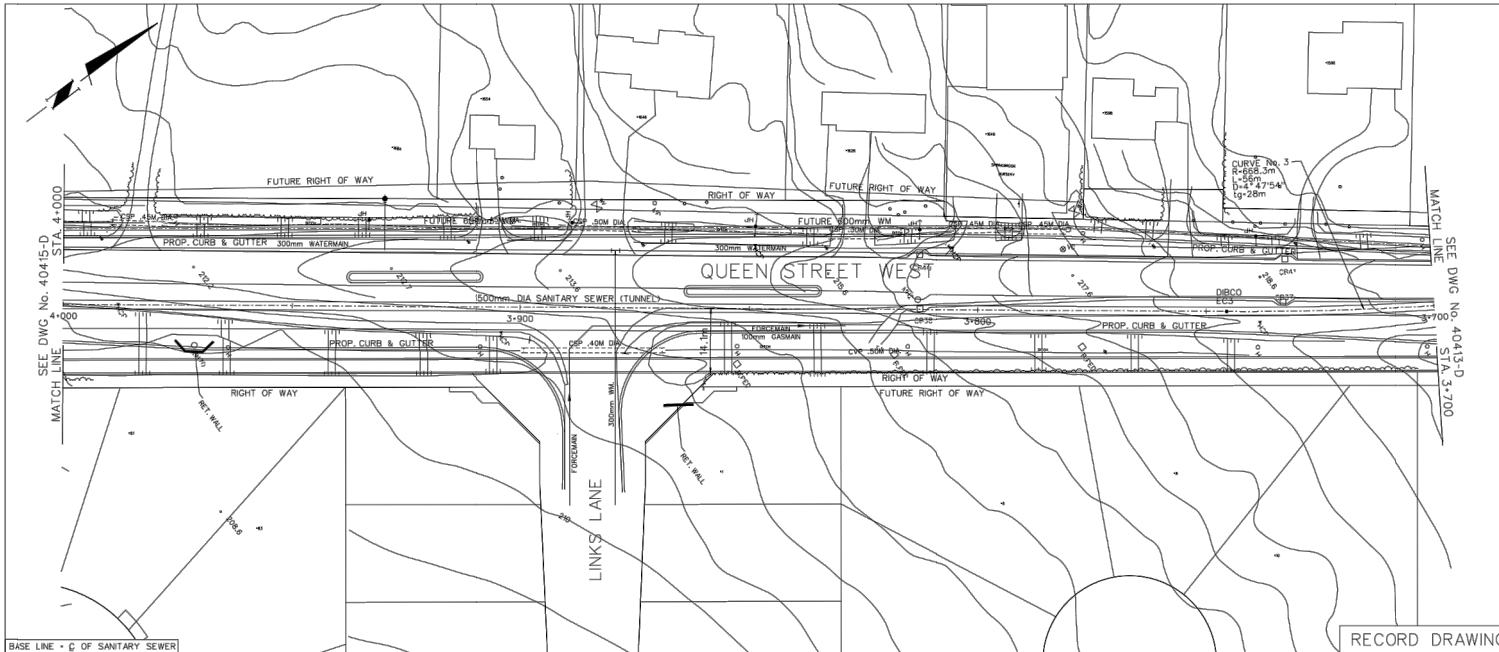
10m HORIZONTAL SCALE
 1m VERTICAL SCALE

Region of Peel
Working for you

**Proposed West-East (Alternative 2)
 Sanitary Sewer Obverts**

ELDORADO PARK TO MISSISSAUGA ROAD
 Sta. 3+400 To Sta. 3+700

Letts: [Blank] Area: [Blank] BWS: [Blank] Project No: 05-2230
 Checked by: BB Drawn by: KK
 Date: FEB. 08 Sheet: 5 of 10 Plot No: 40413-D



KEY PLAN - N.T.S.

SERVICE DATA					
SERVICE	DATE	INT.	SERVICE	DATE	INT.
LOW SEWER			LOW SEWER		
STORM SEWER			BELL U/G CABLE		
WATERMANS			HYDRO U/G CABLE		
TRANSIT			FOOTING		
PARKS & REC.			CITY		
OUT-CLER WATER					

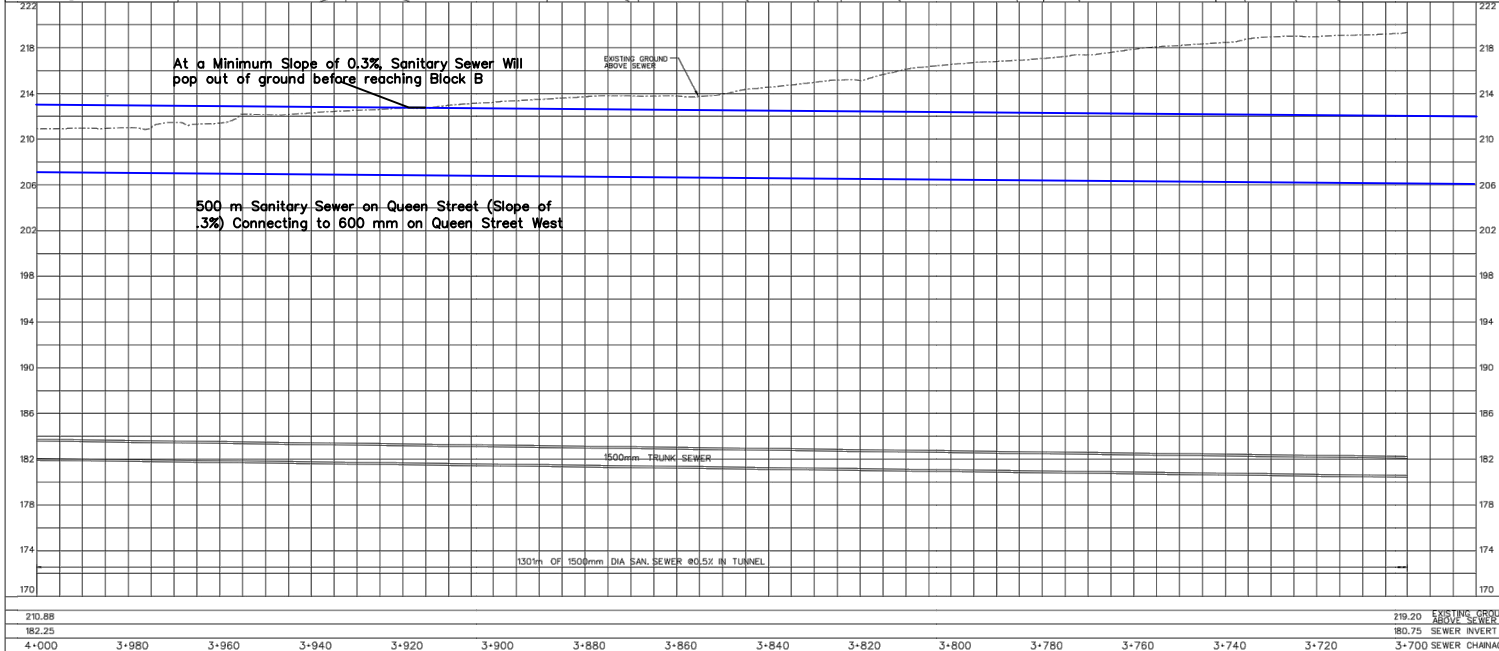
REVISIONS			
DATE	ISSUED FOR	DETAILS	INT.
MAY 2008	ISSUED FOR TENDER		CS
SEPT 2008	ISSUED FOR CONSTRUCTION		CS
DEC 2011	AS CONSTRUCTED		CS

General Notes

- ALL DRIVEWAYS SHOWN UNLESS OTHERWISE NOTED.
- ALL SERVICE LOCATIONS ARE APPROXIMATE AND MUST BE LOCATED ACCURATELY IN THE FIELD.
- ⊙ DENOTES BUILDING - NOT LOCATED
- ⊙ DENOTES BUILDING LOCATED
- ⊙ TYPE 'R' BEADING UNLESS OTHERWISE NOTED (S&W)

CITY OF BRAMPTON B.M. No. 05-87 ELEV. 222.897m
 RED BRICK BUILDING ON NORTHWEST CORNER OF QUEEN STREET WEST AND CHANDLER ROAD TABLET IN SOUTH FACE 0.46m WEST OF SOUTHWEST CORNER 0.5m ABOVE GROUND

THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING UTILITIES PRIOR TO AND DURING CONSTRUCTION. LOCATION OF EXISTING UTILITIES APPROXIMATE ONLY, TO BE VERIFIED IN FIELD BY CONTRACTOR.



RECORD DRAWING

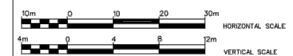
600 Cochrane Drive, Suite 500, Markham, ON, L3R 5K3
 Telephone: (905) 475-7270 / Fax: (905) 475-5994

ORIGINALLY STAMPED
 BY C.D. STERNEN
 ON SEPT 19, 2008

DESIGNED BY: CHD APPROVED BY:

NOTICE TO CONTRACTOR
 48 HOURS PRIOR TO COMMENCING WORK NOTIFY THE FOLLOWING

THE REGIONAL MUNICIPALITY OF PEEL
 CITY OF BRAMPTON WORKS DEPT.
 BELL TELEPHONE COMPANY
 CONSUMERS GAS COMPANY
 HYDRO ELECTRIC POWER COM. OF ONTARIO
 HYDRO ELECTRIC COM. CITY OF BRAMPTON
 CABLE TELEVISION



**Proposed West-East (Alternative 2)
 Sanitary Sewer Obverts**

ELDRADO PARK TO MISSISSAUGA ROAD
 Sta. 3+700 To Sta. 4+000

210.88	219.20	EXISTING GROUND ABOVE SEWER	219.20	EXISTING GROUND ABOVE SEWER											
182.25	180.75	SEWER INVERT	180.75	SEWER INVERT											
4+000	3+980	3+960	3+940	3+920	3+900	3+880	3+860	3+840	3+820	3+800	3+780	3+760	3+740	3+720	3+700 SEWER CHARGE

Lots	Area	BIS	Project No.	05-2230
Checked by	BB	Drawn by	KK	
Date	FEB. 08	Sheet	7 of 10	Plan No.
				40414-D