Flow
Building our future, faster.

Central Brampton

Appendix B

Hydraulic Modelling Technical Memo

AECOM

Peel Region

Flow
Building our future, faster.

Central Brampton

Technical Memorandum No. 1 – Routing Options for Kennedy Sanitary Trunk Sewer (STS)

Regional Municipality of Peel

60736820

November 2025

AECOM

Peel Region

Authors

Report Prepared By:

Sophy Leung
Hydraulic Analysis Modeller

Report Checked By:

Benny Wan
Modelling Manager

Revision History

Revision #	Revision Date	Revised By	Details
0A	July 22, 2025	Sophy Leung	
0B	October 28, 2025 November 17, 2025	Sophy Leung	
00	November 21, 2025		

Distribution List

# Hard Copies	PDF Required	Association / Company Name
	✓	Regional Municipality of Peel
	✓	AECOM Canada ULC

Table of Contents

1. Introduction 1
2. Routing Options 3
3. Analysis Approach 6
   3.1 Service Population / Drainage Area Mapping 6
   3.2 Design Flow Evaluations 12
   3.3 Size and Elevation Review 13
4. Preferred Alignment 20
5. Potential Upsizes Evaluation 25
   5.1 Minimum Required Sizes 25
   5.2 Upsizing to 2100 mm 26
   5.3 Upsizing to 2400 mm 26
   5.4 Discussion 27
6. Potential Project Interfaces 28
7. Next Step 29

Figures

Figure 1.1: Kennedy Sanitary Trunk Sewer Options (North) 2
Figure 1.2: Kennedy Sanitary Trunk Sewer Options (South) 2
Figure 2.1: Routing Option N1 + S1 3
Figure 2.2: Routing Option N1 + S2 4
Figure 2.3: Routing Option N2 + S1 4
Figure 2.4: Routing Option N2 + S2 5
Figure 3.1: Estimated Drainage Areas for Routing Option N1/N2 + S1 9
Figure 3.2: Estimated Drainage Area for Routing Option N1/N2 + S2 (without Connection No. 6) 10
Figure 3.3: Estimated Drainage Area for Routing Option N1/N2 + S2 (with Connection No.6) 11
Figure 3.4: Preliminary Profile for Routing Option N1 + S1 14
Figure 3.5: Preliminary Profile for Routing Option N2 + S1 14

Figure 3.6: Preliminary Profile for Routing Option N1 + S2 (without Connection No. 6) 15
Figure 3.7: Preliminary Profile for Routing Option N2 + S2 (without Connection No. 6) 15
Figure 3.8: reliminary Profile for Routing Option N1 + S2 (with Connection No. 6) 16
Figure 3.9: Preliminary Profile for Routing Option N2 + S2 (with Connection No. 6) 16
Figure 3.10: Modelling Results of Route S2 without Connection No. 6 18
Figure 3.11: Modelling Results of Route S2 with Connection No. 6 19
Figure 4.1: Preferred Alignment and Connection Points for Kennedy STS (N1 + S2) 20
Figure 4.2: Profile for Routing Option N1 + S2 (Option 1) 21
Figure 4.3: Profile for Routing Option N1 + S2 (Option 2) 22
Figure 4.4: Profile for Routing Option N1 + S2 (Option 1) 23

Tables

Table 3.1: Potential Connections for the future Kennedy STS 7
Table 3.2: Design Flows for Kennedy STS 12
Table 3.3: Proposed Pipe Sizes and Slope for Kennedy STS 17
Table 4.1: Design Flows for Kennedy STS 24
Table 6.1: Key Infrastructure Projects and Utilities 28

Appendices

Appendix A. Downtown Brampton Servicing Concept

Appendix B. Design Flow Evaluation Results

Appendix C. Hydraulic Modelling Results

Appendix D. References for Potential Project Interfaces

1. Introduction

AECOM Canada ULC has been retained by Regional Municipality of Peel (Region) to determine the specifications for each future Kennedy Sanitary Trunk Sewer (STS) routing option, the Region's latest hydraulic model (InfoWorks ICM), population projections as per Region's Small Geographic Unit (SGU) and design criteria were utilized. This technical memorandum provides a detailed description of the approach in utilizing the information and the analysis results to support the current Class Environmental Assessment Study (Class EA) for the Kennedy STS. **Figure 1.1** and **Figure 1.2** present the short-listed routing options for the Kennedy STS.

The following short-listed routing options are referenced throughout this report and are defined as follows:

- N1 refers to the proposed alignment along the Orangeville-Brampton Railway (OBR) corridor, shown as the purple line in **Figure 1.1**.
- N2 refers to the proposed alignment along McLaughlin Road, shown as the blue line in **Figure 1.1**.
- S1 refers to the proposed alignment along Bovaird Drive and Kennedy Road, shown as the green and red lines in **Figure 1.2**.
- S2 refers to the proposed alignment along Vodden Street, the OBR corridor, and Kennedy Road, shown as the purple and red lines in **Figure 1.2**.

Figure 1.1: Kennedy Sanitary Trunk Sewer Options (North)

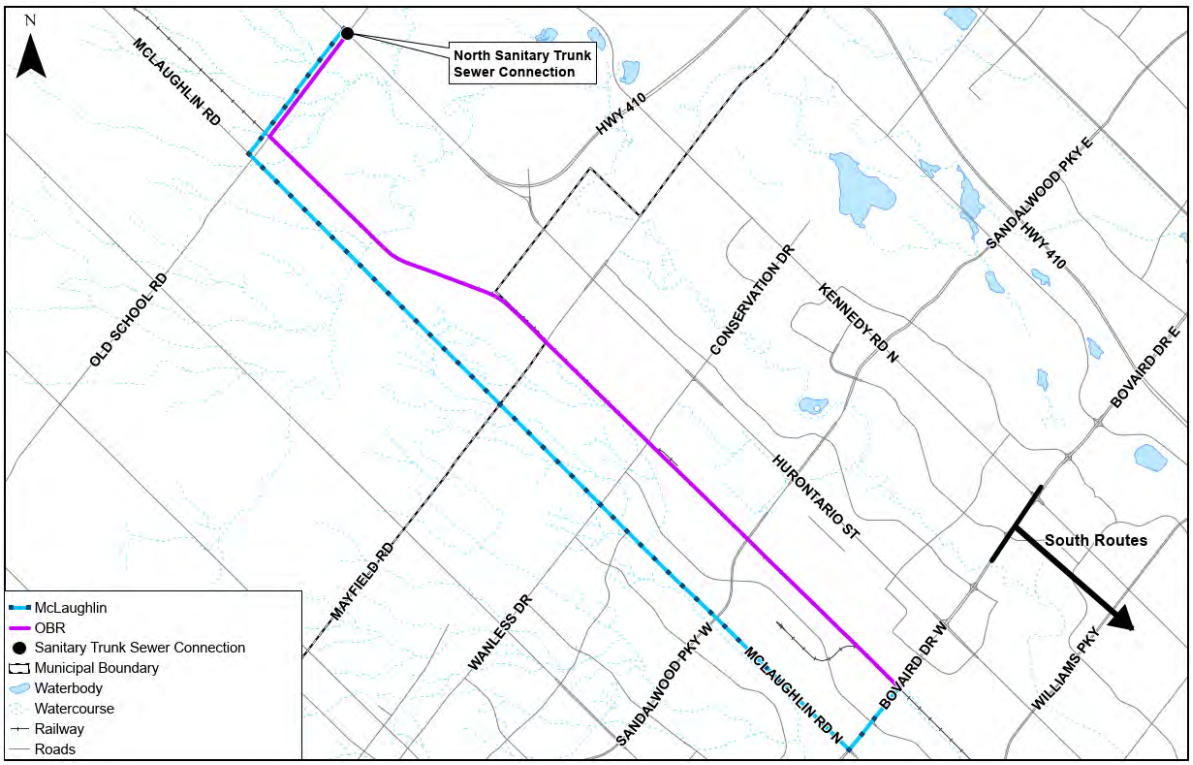
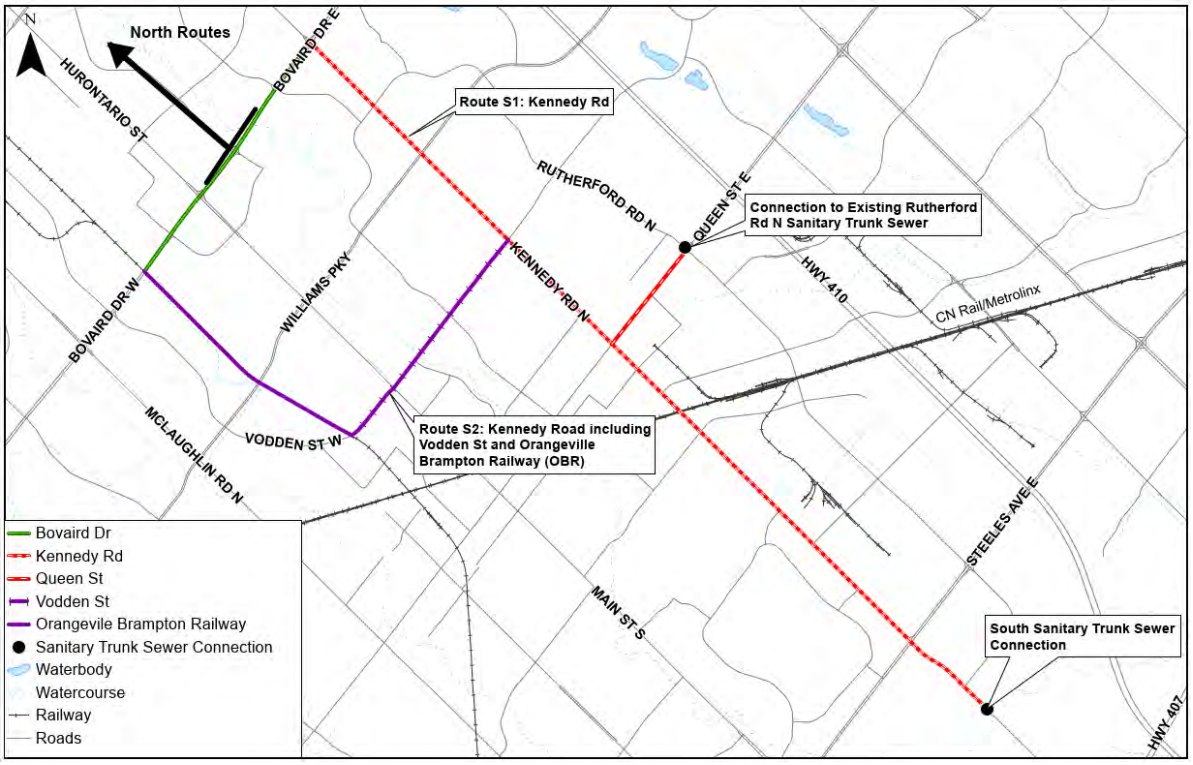


Figure 1.2: Kennedy Sanitary Trunk Sewer Options (South)



2. Routing Options

Based on the North and South short-listed routing options presented in **Figure 1.1** and **Figure 1.2**, a total of four routing options would be evaluated for the hydraulic analysis. These four routing options are:

1. Option 1: N1 + S1
2. Option 2: N1 + S2
3. Option 3: N2 + S1
4. Option 4: N2 + S2

Figures 2.1 to **Figures 2.4** present the routing option being considered in the hydraulic analysis.

Figure 2.1: Routing Option N1 + S1

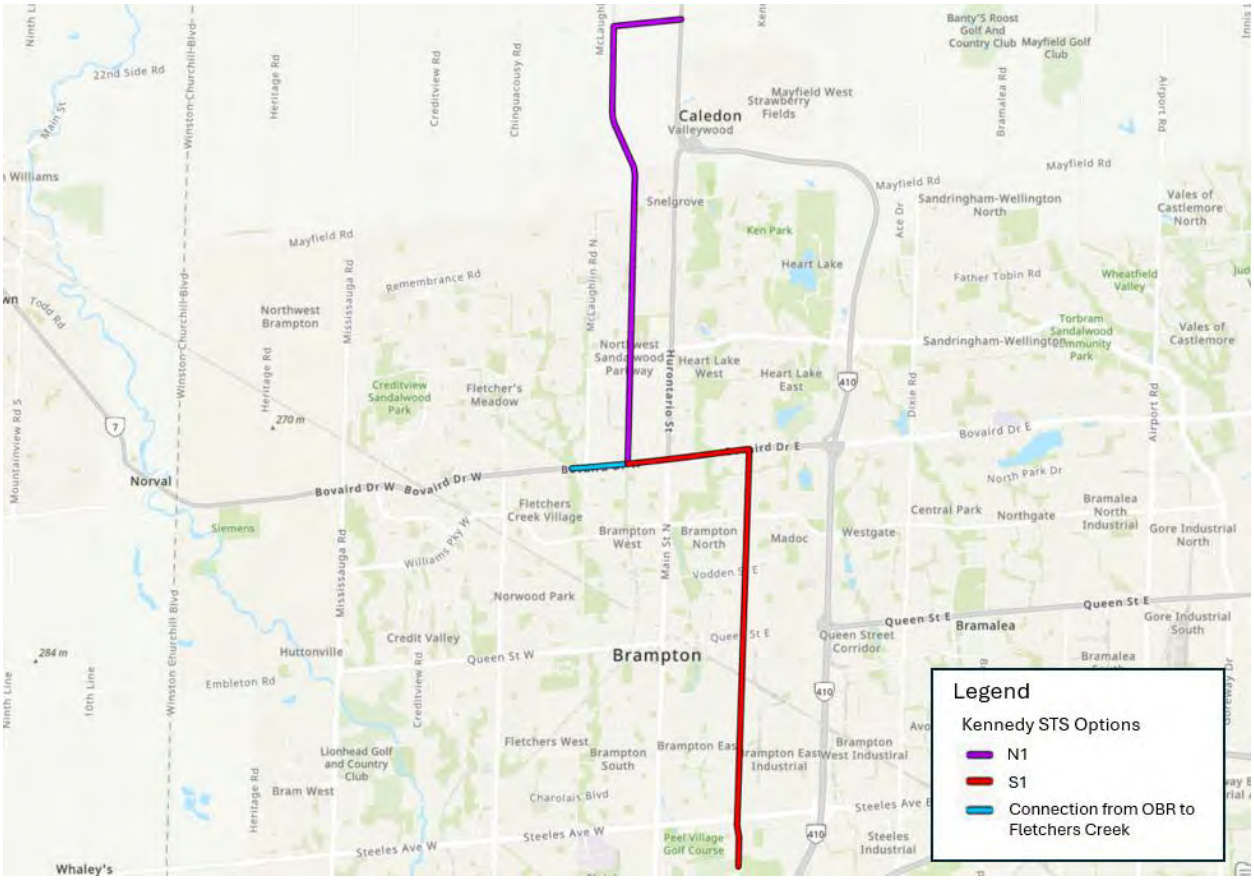


Figure 2.2: Routing Option N1 + S2

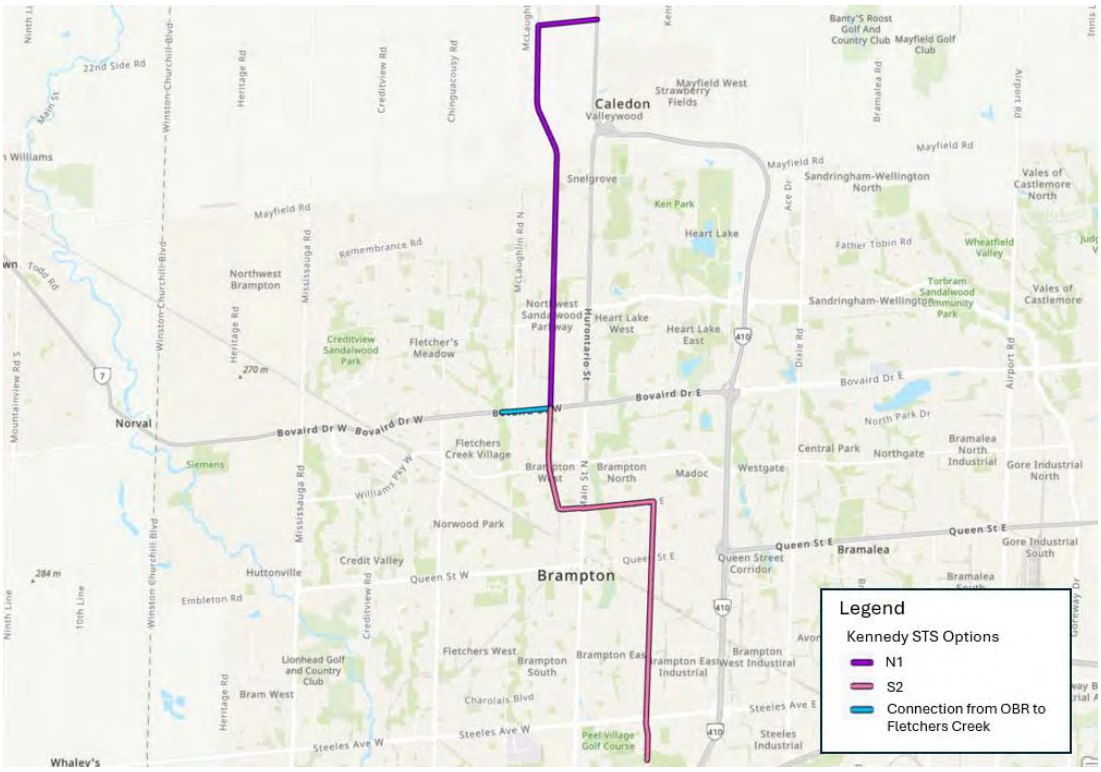


Figure 2.3: Routing Option N2 + S1

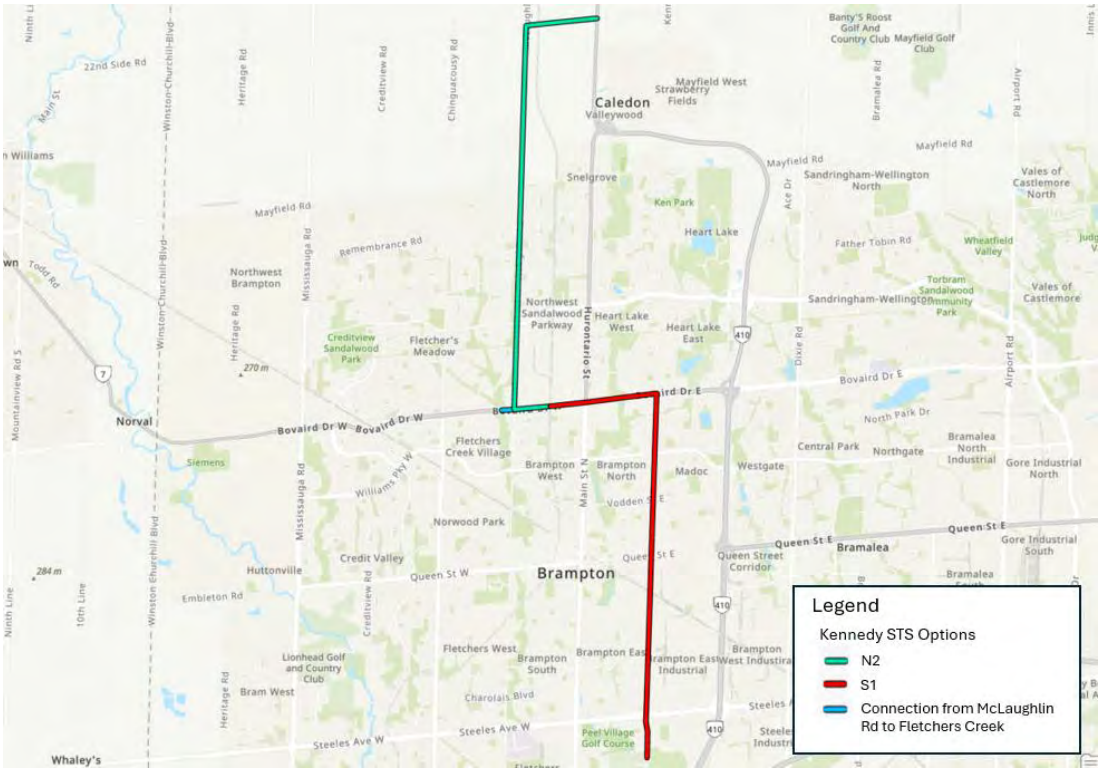
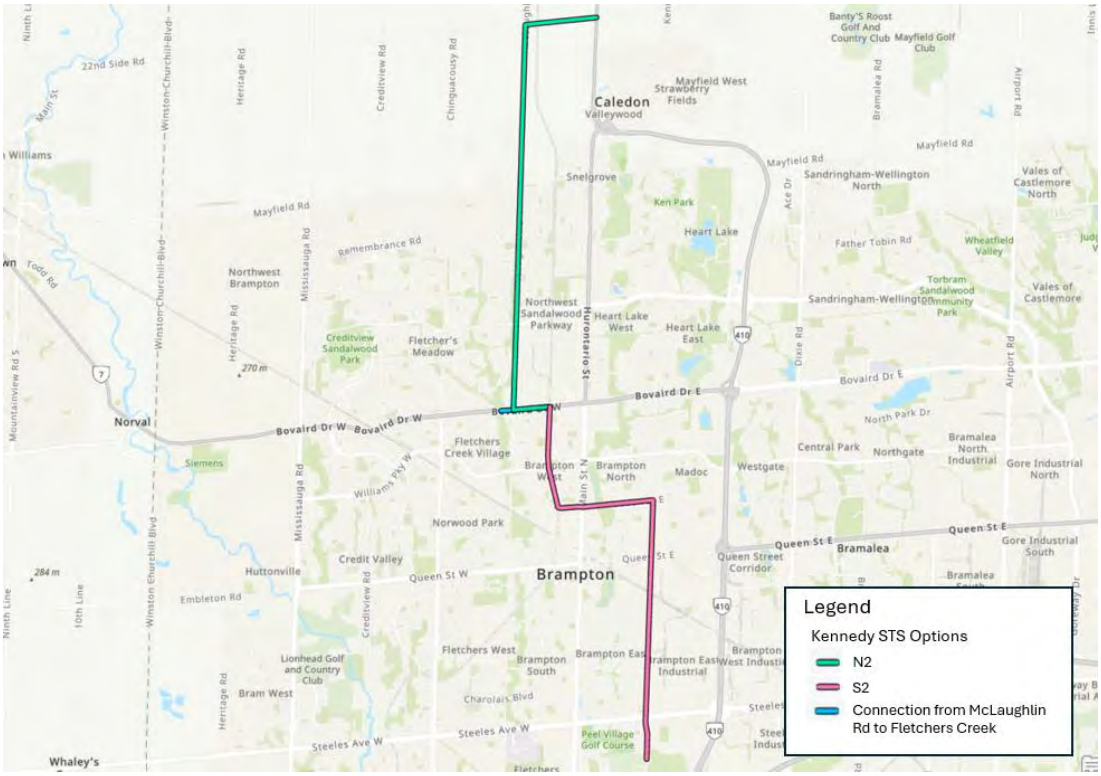


Figure 2.4: Routing Option N2 + S2



3. Analysis Approach

The evaluation of the size requirements for the Kennedy STS includes the following key tasks:

- Service Population / Drainage Area Mapping
- Design Flow Evaluations
- Size and Elevation Review

The following sub section provides the detailed description of the approach used for the above noted tasks.

3.1 Service Population / Drainage Area Mapping

Servicing population for the following nine (9) locations along the future Kennedy STS was identified based on the existing wastewater system connectivity as per the Region's wastewater hydraulic model and the Region's population projection layer (SGU or Small Geographic Unit) for Scenario 2 (high growth scenario).

Table 3.1 presents the summary of potential connections for the future Kennedy STS. Figures 3.1 to 3.3 shows the approximated drainage areas for the Kennedy STS based on different connection options.

Table 3.1: Potential Connections for the future Kennedy STS

Connection No.	Location	Routing Option N1/N2 + S1 (Figure 3.1)	Routing Option N1/N2 + S2 (Figures 3.2 and 3.3)	Description
1	South of Glidden Road and Kennedy Road	✓	✓	To receive local collection sewer flows from existing network
2	Queen Street and Kennedy Road	✓	✓	To receive local collection sewer flows from existing network via future sewer upgrades on Queen Street. Appendix A shows the servicing concept / upgrade requirements
3	Church Street and Kennedy Road	✓	✓	To receive local collection sewer flows from existing network via future sewer upgrades on Church Street. Appendix A shows the servicing concept / upgrade requirements
4	Sheffield Park and Kennedy Road	Could be removed. Flows will be diverted to existing Etobicoke Creek STS. It has been considered for this hydraulic analysis and pipe design.	✗	To receive local collection sewer flows from existing network
5A	Vodden Road Connection	✗	✓	To receive flows from existing Etobicoke Creek Sanitary Trunk Sewer, which including Sheffield Park area (light green area in Figure 3.1), Etobicoke Creek and Bovaird Drive East area (dark green area in Figure 3.1), and Etobicoke Creek West and Bovaird Drive East area (yellow area in Figure 3.1).
5B	Etobicoke Creek and Bovaird Drive East	✓	✗	To receive local collection sewer flows from existing Etobicoke Creek Sanitary Trunk Sewer
6	Etobicoke Creek West and Bovaird Drive East	✓	Connection No. 6 will be an option for this route. Details will be discussed below.	To receive local collection sewer flows from existing network

Connection No.	Location	Routing Option N1/N2 + S1 (Figure 3.1)	Routing Option N1/N2 + S2 (Figures 3.2 and 3.3)	Description
7	Fletchers Creek and Bovaird Drive East	✓	✓	To receive sanitary sewer flows from existing Fletcher Creek Sanitary Trunk Sewer
8	Future Street A	✓	✓	To receive local collection sewer flows from future West Mayfield Development. Appendix A presents the servicing concept for the future developments
9	Old School Road and Hurontario Street	✓	✓	To receive local collection sewer flows from future development, north of Old School Road and Existing Dougall SPS Service Area

Figure 3.1: Estimated Drainage Areas for Routing Option N1/N2 + S1

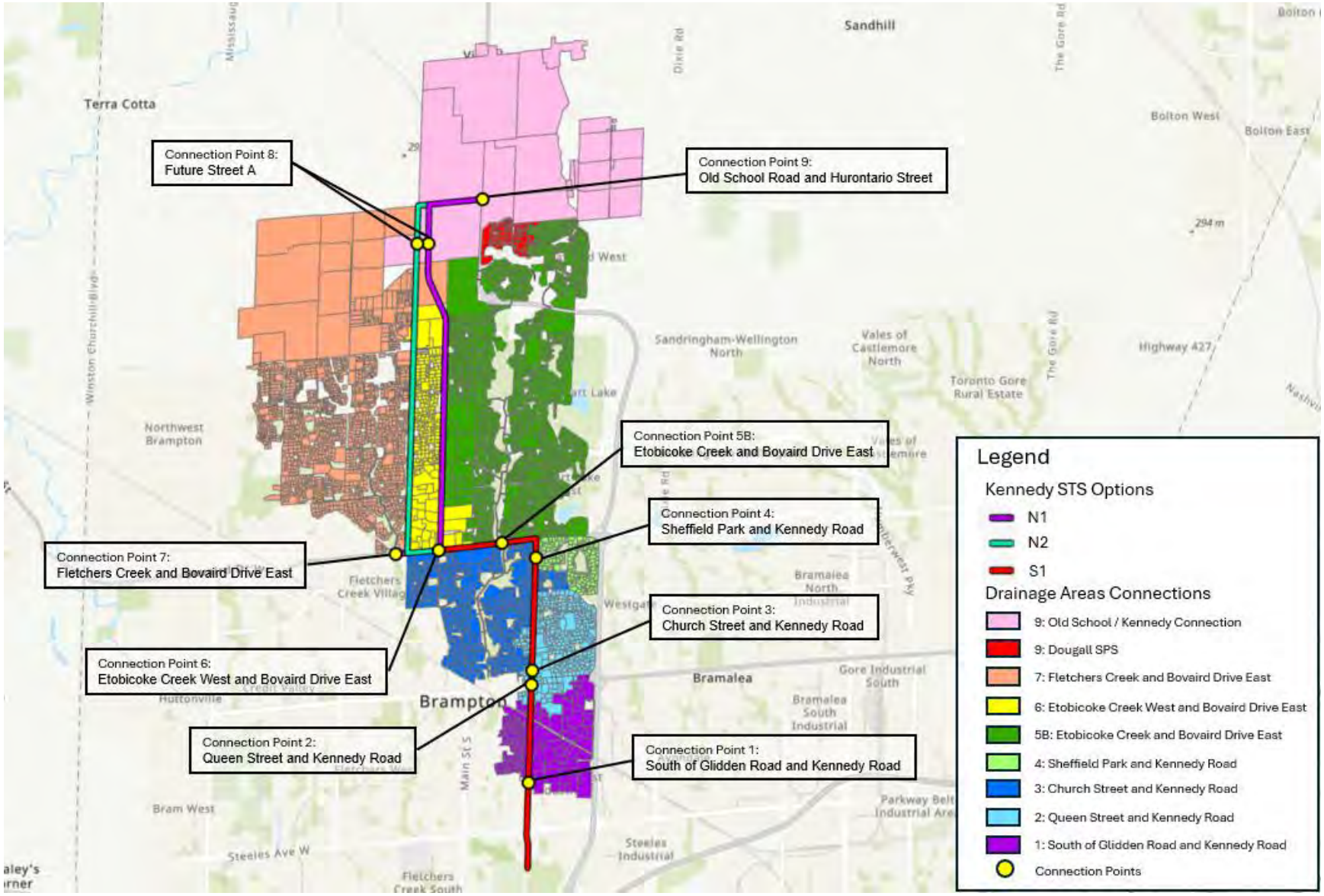


Figure 3.2: Estimated Drainage Area for Routing Option N1/N2 + S2 (without Connection No. 6)

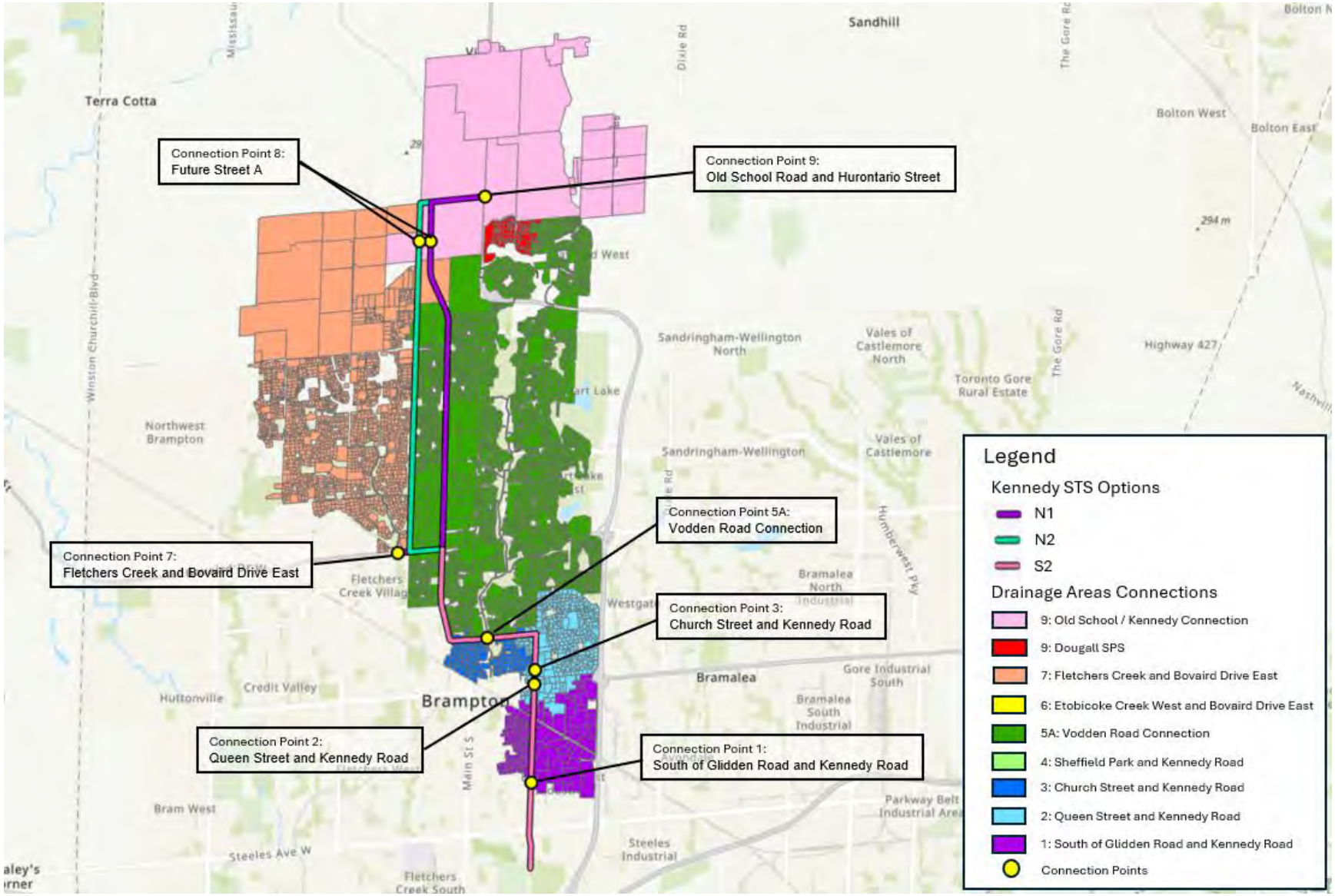
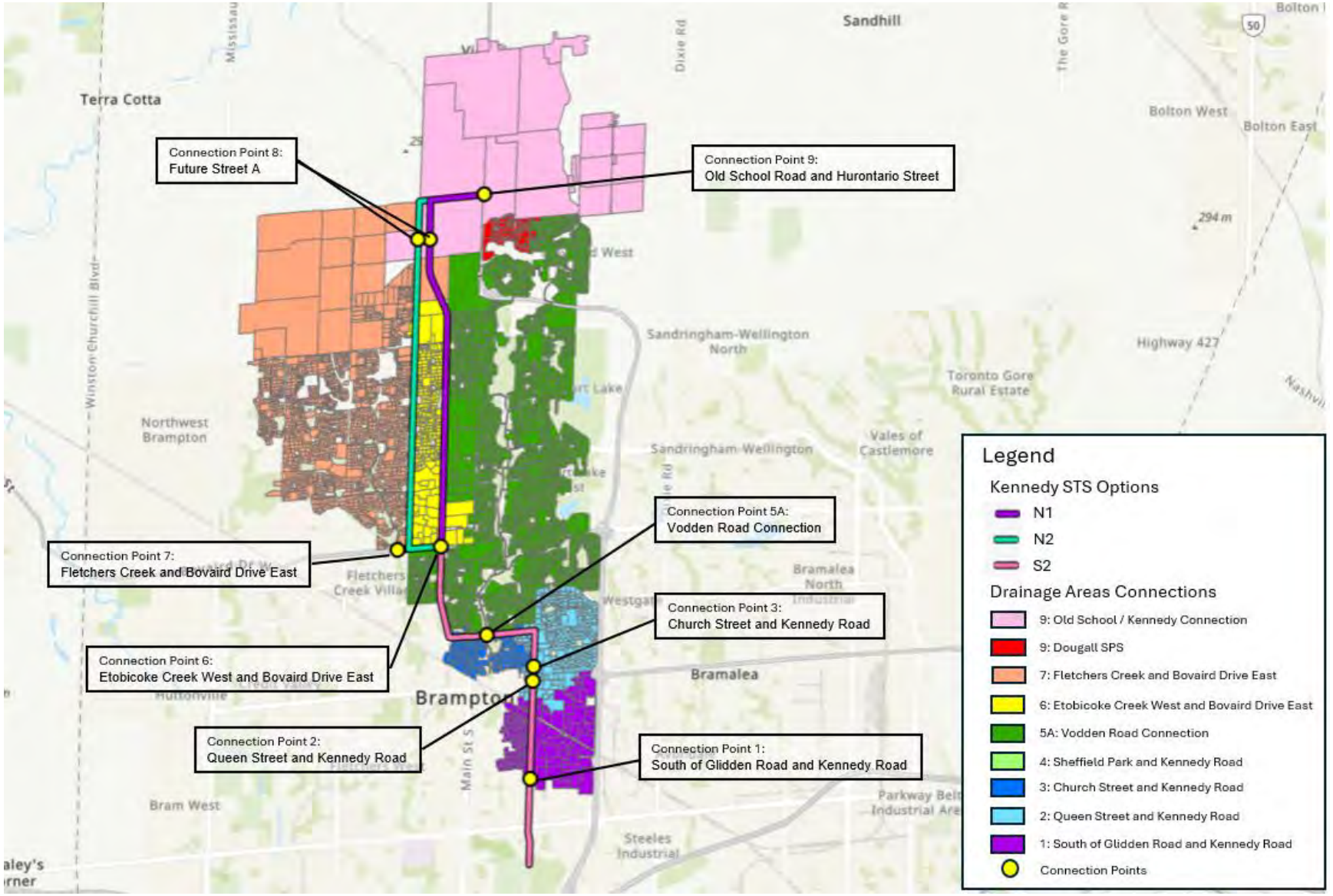


Figure 3.3: Estimated Drainage Area for Routing Option N1/N2 + S2 (with Connection No.6)



3.2 Design Flow Evaluations

Based on the available information provided for this study, two (2) methods for evaluating the design flows for Kennedy STS was reviewed and these methods are:

1. Region's Master Plan Study Design Criteria for SGU Population Projections
   a) Dry Weather Flow (DWF) Rate: 285 L/ca/d
   b) DWF Peak Factor: Harmon Formula
   c) Inflow and Infiltration (I&I) Allowance: 0.26 L/s/ha
   d) Design Flows = a. x b. + c. x contribution areas based on SGU shape
2. Peak flow for future system based on current hydraulic model

Table 3.2 summarizes the design flows based on these two methodologies and Appendix B presents the flow evaluation details.

Table 3.2: Design Flows for Kennedy STS

Connection No.	Location	Design Flow Estimation Method 1		Design Flow Estimation Method 2	
		Estimated Flows (Accumulated Flows)	Proposed Pipe Size	Estimated Flows (Accumulated Flows)	Proposed Pipe Size
1	South of Glidden Road and Kennedy Road	339.8 L/s (4,824.1 L/s)	2100 mm	581.0 L/s (4,736.9 L/s)	2100 mm
2	Queen Street and Kennedy Road	517.9 L/s (4,484.3 L/s)	2100 mm	469.0 L/s (4,156.0 L/s)	2100 mm
3	Church Street and Kennedy Road[1]	1,655.5 L/s (3,813.1 L/s)	1800 mm	1,378.0 L/s (3,687.0 L/s)	1800 mm
4	Sheffield Park and Kennedy Road[2]	137.8 L/s (3,265.1 L/s)	1800 mm	58.4 L/s (3,184.7 L/s)	1800 mm
5A	Vodden Road Connection[1]	1,631.53 L/s (3,570.5 L/s)	1800 mm	1,741.8 L/s (3,546.9 L/s)	1800 mm
5B	Etobicoke Creek STS and Bovaird Drive East[2]	969.7 L/s (3,127.2 L/s)	1800 mm	817.3 L/s (3,126.4 L/s)	1800 mm
6	Etobicoke Creek West and Bovaird Drive East[2]	352.5 L/s (2,157.6 L/s)	1500 mm	322.4 L/s (2,309.1 L/s)	1500 mm
7	Fletchers Creek and Bovaird Drive East	1,236.3 L/s (1,805.1 L/s)	1500 mm	1,151.0 L/s (1986.7 L/s)	1500 mm
8	Future Street A	568.8 L/s (568.8 L/s)	900 mm	835.7 L/s (835.7 L/s)	1050 mm
9	Old School Road and Hurontario Street (include Dougall SPS service area)		900 mm		1050 mm

Note: 1. Based on Route S2
2. Based on Route S1

In comparison of the estimated design flows for the two methods presented in Table 3.2 above, it is recommended that design flows estimated based on Method 1 should be considered except for the Old School / Hurontario Street connection since it provides the most conversative values for determining the size of the future Kennedy STS. According to the modelling results, the projected flows for the Old School / Hurontario Street connection point was higher than those for Method 1 and therefore the Kennedy STS from Old School / Hurontario Street connection to Fletcher Creek / Bovaird Drive East connection (Connection No.7) should be sized based on Method 2.

3.3 Size and Elevation Review

Based on the design flows for Method 1 presented in Section 2.2, the size and elevation of the future Kennedy STS were reviewed for each routing option. The following criteria were applied when determining the size and elevation for the Kennedy STS.

- 2020 Water & Wastewater Master Plan of Region of Peel:
  - Flow depth versus sewerline diameter <= 85%
- Linear Wastewater Standards of Region of Peel:
  - Design flows versus sewerline capacity <= 70%
  - Maximum velocity <= 3.0%
  - Minimum depth of the sewerline obvert >= 2.5 m of ground elevation
  - Minimum depth of the sewerline obvert >= 5.0 m of bottom of the natural features (e.g., creek, river)
  - Elevation of the connection point <= invert of the existing sewerlines

Based on the above noted criteria, the size and elevation of the future Kennedy STS were estimated, and Figures 3.4 to 3.9 presents the preliminary profile for the four Kennedy STS routing options.

Figure 3.4: Preliminary Profile for Routing Option N1 + S1

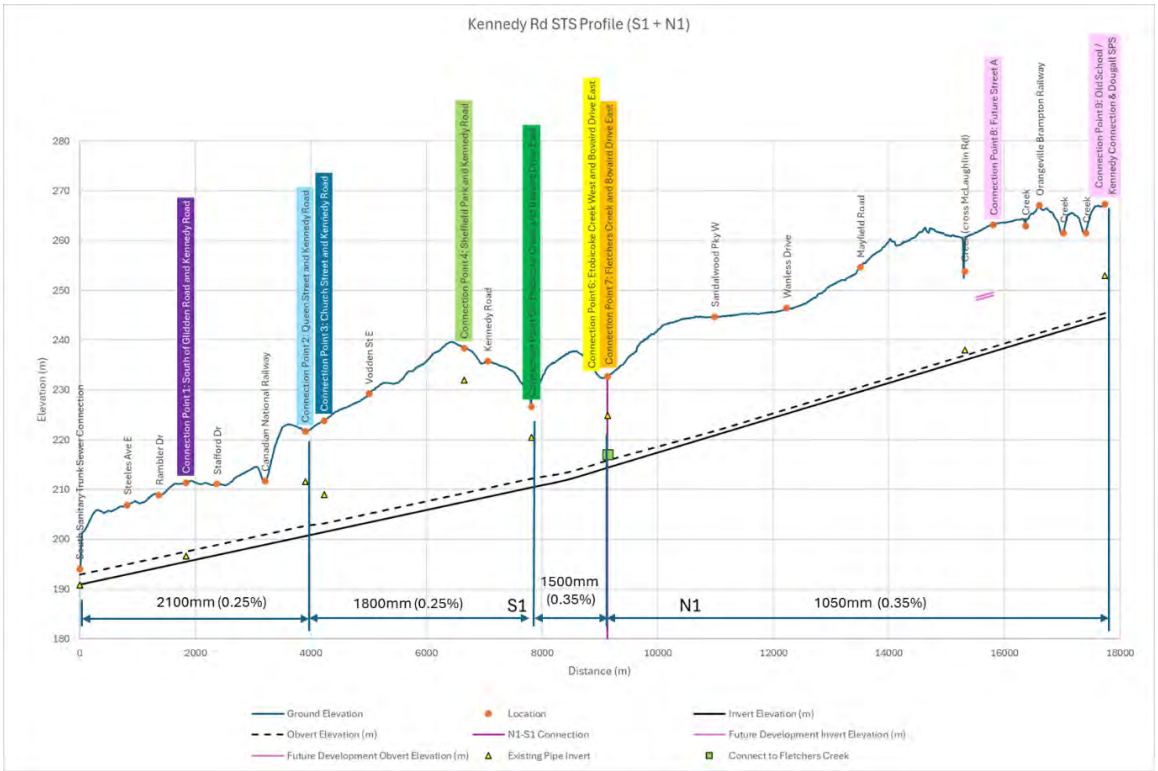


Figure 3.5: Preliminary Profile for Routing Option N2 + S1

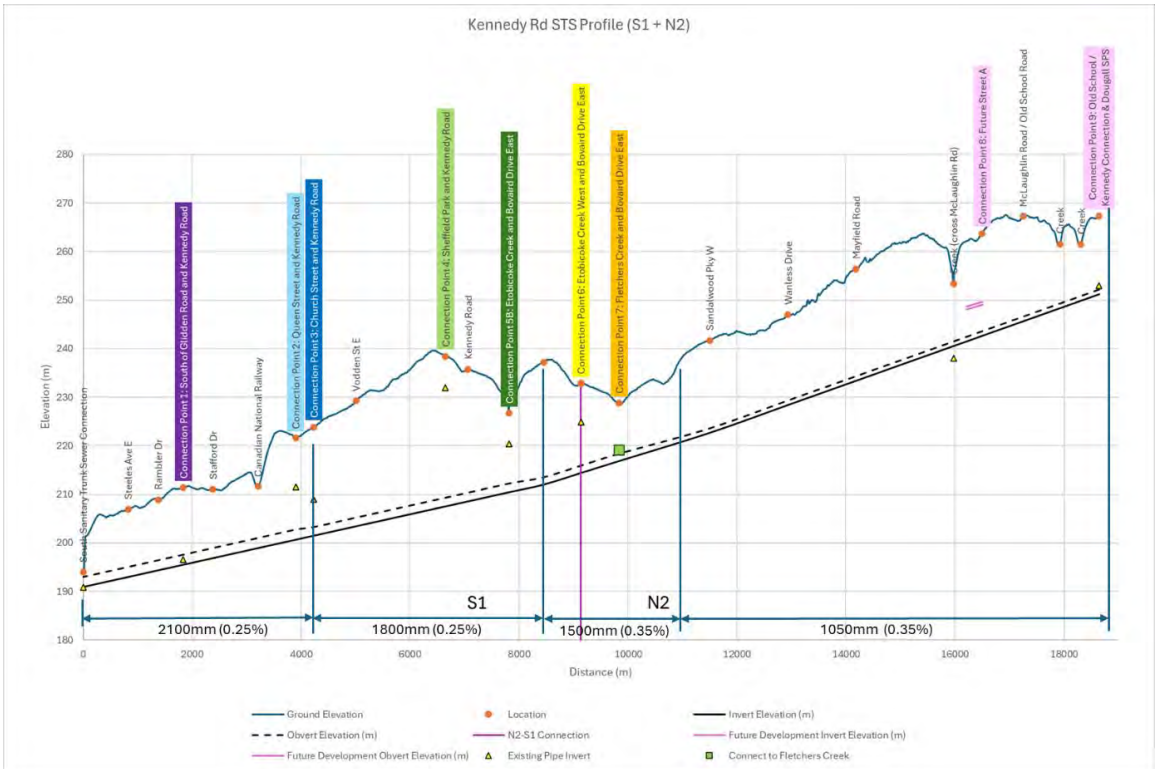


Figure 3.6: Preliminary Profile for Routing Option N1 + S2 (without Connection No. 6)

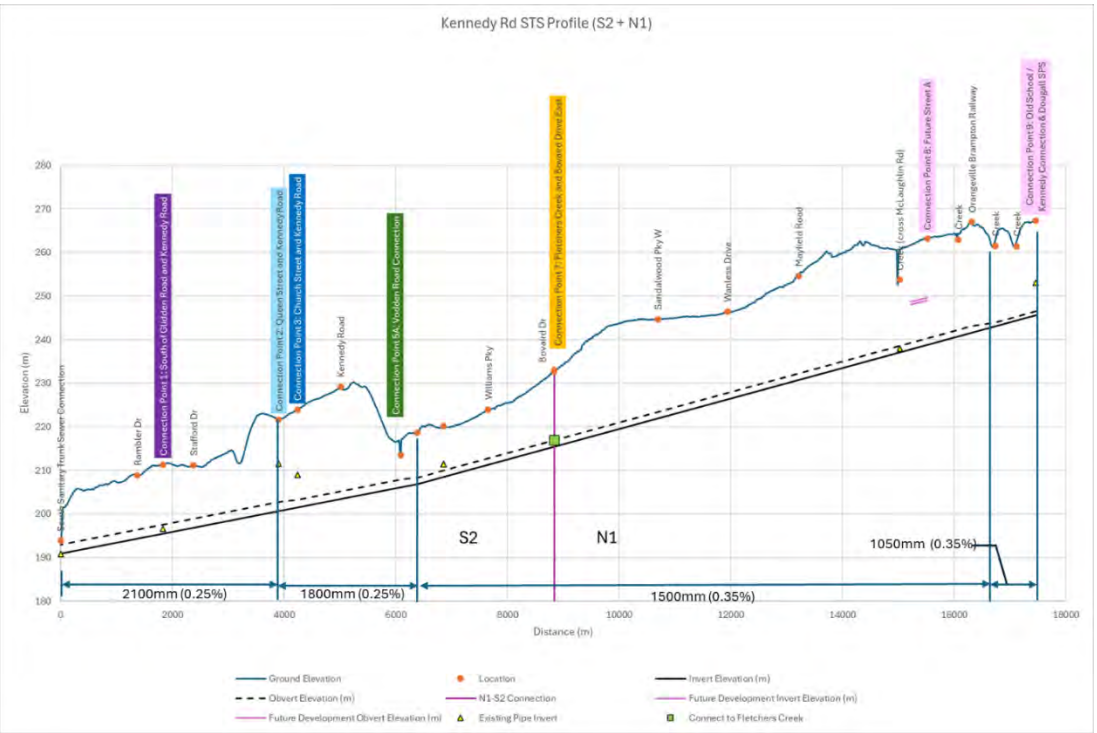


Figure 3.7: Preliminary Profile for Routing Option N2 + S2 (without Connection No. 6)

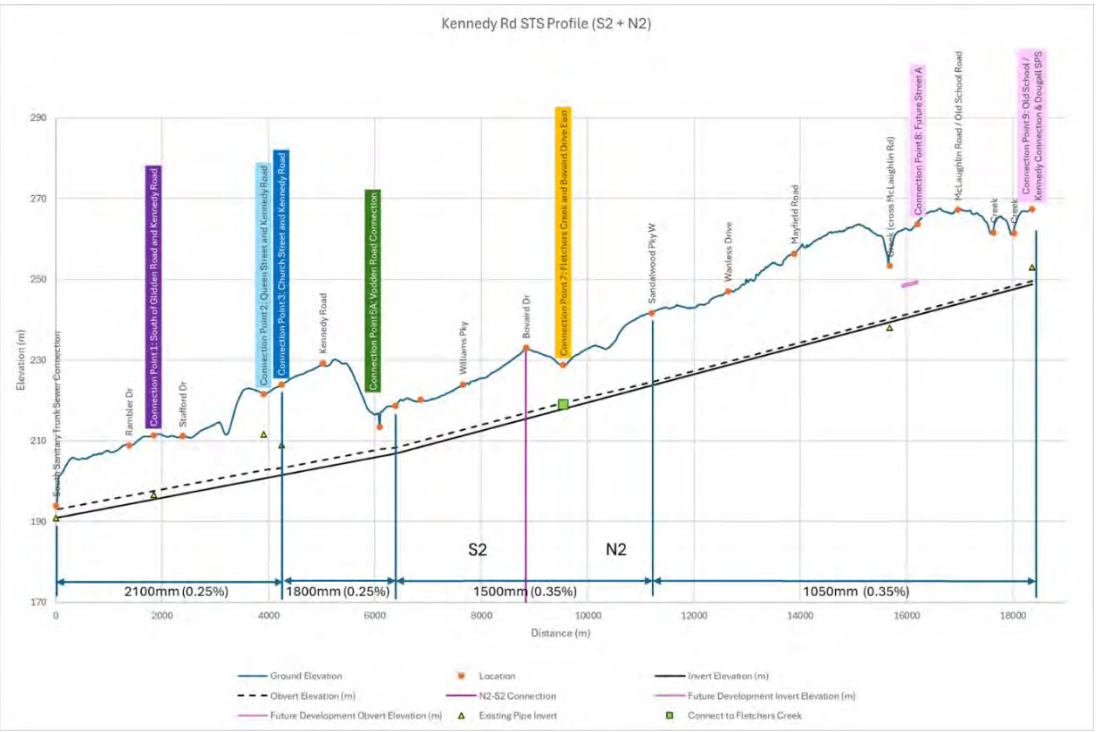


Figure 3.8: reliminary Profile for Routing Option N1 + S2 (with Connection No. 6)

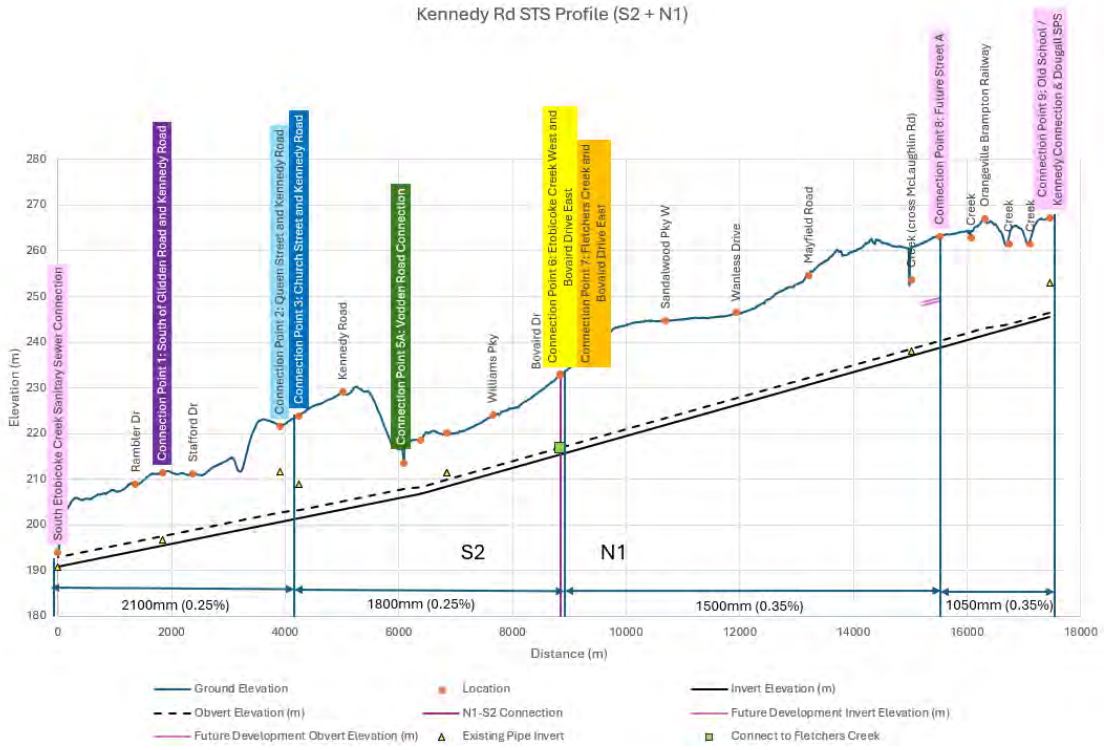


Figure 3.9: Preliminary Profile for Routing Option N2 + S2 (with Connection No. 6)

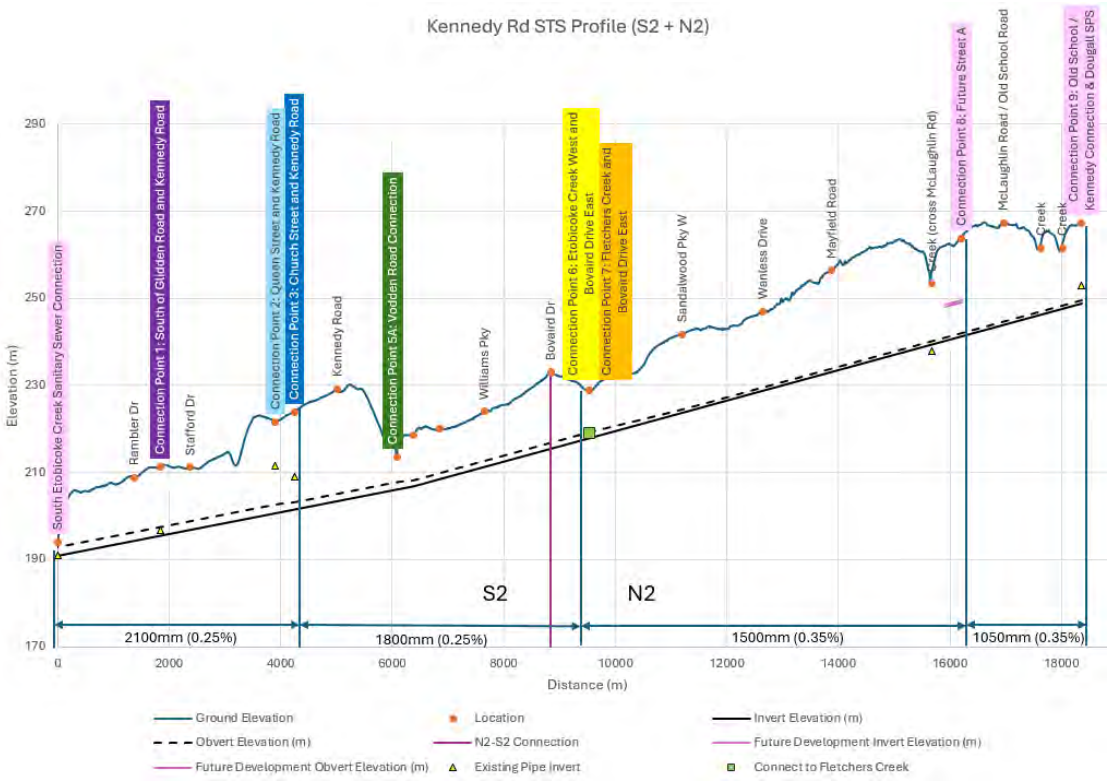


Table 3.3 summarizes the proposed pipe sizes based on Method 2.

Table 3.3: Proposed Pipe Sizes and Slope for Kennedy STS

Connection No.	Location	N1+S1	N2+S1	N1+S2 (without Connection No. 6)	N2+S2 (without Connection No. 6)	N1+S2 (with Connection No. 6)	N2+S2 (with Connection No. 6)
1	South of Glidden Road and Kennedy Road	2100 mm 0.25%	2100 mm 0.25%	2100 mm 0.25%	2100 mm 0.25%	2100 mm 0.25%	2100 mm 0.25%
2	Queen Street and Kennedy Road	2100 mm 0.25%	2100 mm 0.25%	2100 mm 0.25%	2100 mm 0.25%	2100 mm 0.25%	2100 mm 0.25%
3	Church Street and Kennedy Road[1]	1800 mm 0.25%	1800 mm 0.25%	1800 mm 0.25%	1800 mm 0.25%	2100 mm 0.25%	2100 mm 0.25%
4	Sheffield Park and Kennedy Road[2]	1800 mm 0.25%	1800 mm 0.25%	-	-	-	-
5A	Vodden Road Connection[1]	-	-	1800 mm 0.25%	1800 mm 0.25%	1800 mm 0.25%	1800 mm 0.25%
5B	Etobicoke Creek STS and Bovaird Drive East[2]	1800 mm 0.25%	1800 mm 0.25%	-	-	-	-
6	Etobicoke Creek West and Bovaird Drive East[2]	1500 mm 0.35%	1500 mm 0.35%	-	-	1500 mm 0.30%	1500 mm 0.30%
7	Fletchers Creek and Bovaird Drive East	1500 mm 0.35%	1500 mm 0.35%	1500 mm 0.35%	1500 mm 0.35%	1500 mm 0.30%	1500 mm 0.30%
8	Future Street A	1050 mm 0.35%	1050 mm 0.35%	1050 mm 0.35%	1050 mm 0.35%	1050 mm 0.35%	1050 mm 0.35%
9	Old School Road and Hurontario Street (include Dougall SPS service area)						

As summarized in Table 3.3, the minimum pipe size for the section from Old School Road and Hurontario Street to Fletchers Creek and Bovaird Drive East was 1,050 mm. With the inclusion of approximately 112.83 L/s of additional sanitary flow from the proposed industrial developments located north of Dixie Road, the capacity assessment results indicated that the 1,050 mm diameter sewer would provide sufficient capacity in accordance with the Region's design criteria.

AECOM design team has suggested that the preferred size for this section of the Kennedy STS is ideally to be 1,500 mm for ease of construction. Therefore, capacity assessment for 1,500 mm was conducted to confirm if any adverse impacts (e.g., below minimum scouring velocity) could be resulted. According to the capacity assessment results, the 1,500 mm pipe provides additional capacity while maintaining the velocity at

above the minimum velocity of 0.75 m/s. The final selection of pipe size and slope will be confirmed during the detailed design stage, where site specific constraints and construction logistics can be fully addressed.

A model simulation was conducted to determine the necessity of Connection No. 6 for Route S2. The results identified capacity constraints in the local sewer network along Williams Parkway when this connection was not included. The modelling results highlighting these constraints are presented in Figure 3.10.

Figure 3.10: Modelling Results of Route S2 without Connection No. 6



Link	SMH-1774521.1	SMH-1774520.1	SMH-1774518.1	SMH-1774436.1	SMH-1774435.1	SMH-1774434.1	SMH-1773973.1	SMH-1773977.1
width (mm)	375	375	375	675	675	675	675	675
height (mm)	375	375	375	675	675	675	675	675
length (m)	109.5	109.8	78.4	123.6	122.5	63.8	58.9	121.0
inflow (m3/s)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
grad (m/m)	0.00251	0.00250	0.00249	0.00249	0.00254	0.00345	0.00134	0.00254
pfc (m3/s)	0.088	0.088	0.087	0.420	0.424	0.494	0.308	0.424
us inv (m AD)	220.555	220.275	219.985	219.688	219.380	219.069	218.849	218.770
ds inv (m AD)	220.280	220.000	219.790	219.380	219.069	218.849	218.770	218.462
r.pfc (m3/s)	0.088	0.088	0.087	0.420	0.424	0.494	0.308	0.424
surc	1.00	1.00	1.00	2.00	2.00	1.00	2.00	2.00
DS flow (m3/s)	-0.01118	0.01449	0.06762	0.43614	0.43616	0.43619	0.43908	0.44057
DS velocity (m/s)	0.122	0.128	0.582	1.328	1.367	1.171	1.297	1.272

Node	SMH-1774521	SMH-1774520	SMH-1774518	SMH-1774436	SMH-1774435	SMH-1774434	SMH-1773973	SMH-1773977	SMH-1773979
ground (m AD)	224.705	224.625	224.185	224.088	224.080	224.269	224.049	224.270	224.862

To address the capacity limitations, Connection No. 6 was incorporated into the model as a mitigation measure. The updated simulation results demonstrated that the inclusion of Connection No. 6 effectively alleviates the capacity constraints. Figure 3.11 presents the improved capacity conditions after implementing Connection No. 6.

Figure 3.11: Modelling Results of Route S2 with Connection No. 6



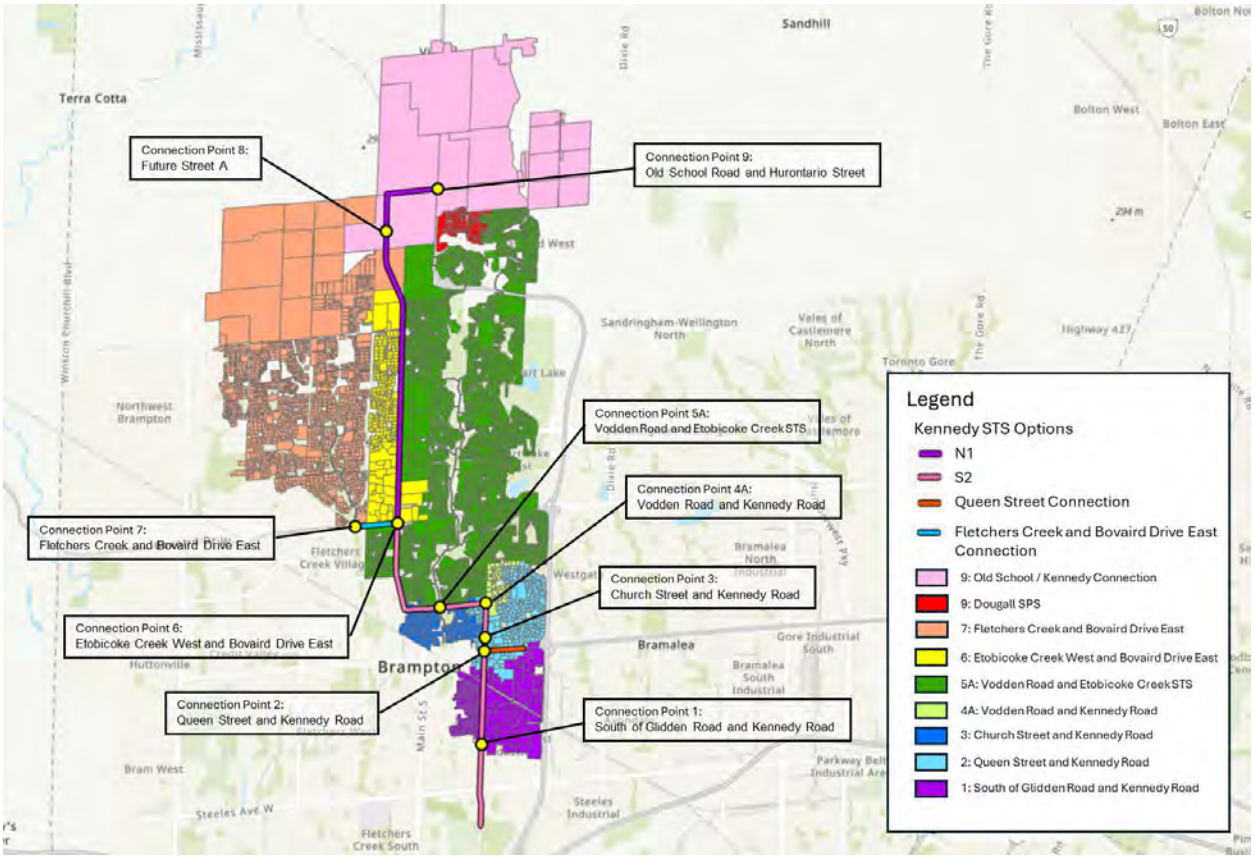
Link	SMH-1774521.1	SMH-1774520.1	SMH-1774518.1	SMH-1774436.1	SMH-1774435.1	SMH-1774434.1	SMH-1773973.1	SMH-1773977.1
width (mm)	375	375	375	675	675	675	675	675
height (mm)	375	375	375	675	675	675	675	675
length (m)	109.5	109.8	78.4	123.6	122.5	63.8	58.9	121.0
inflow (m3/s)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
grad (m/m)	0.00251	0.00250	0.00249	0.00249	0.00254	0.00345	0.00134	0.00254
pfc (m3/s)	0.088	0.088	0.087	0.420	0.424	0.494	0.308	0.424
us inv (m AD)	220.555	220.275	219.985	219.688	219.380	219.069	218.849	218.770
ds inv (m AD)	220.280	220.000	219.790	219.380	219.069	218.849	218.770	218.462
r.pfc (m3/s)	0.088	0.088	0.087	0.420	0.424	0.494	0.308	0.424
surc	0.05	0.69	0.69	0.41	0.40	0.47	0.47	0.42
DS flow (m3/s)	0.00000	-0.00140	0.07255	0.14373	0.14384	0.14394	0.14797	0.15035
DS velocity (m/s)	0.000	-0.024	1.233	1.059	1.153	0.879	1.055	1.043

Node	SMH-1774521	SMH-1774520	SMH-1774518	SMH-1774436	SMH-1774435	SMH-1774434	SMH-1773973	SMH-1773977	SMH-1773979
ground (m AD)	224.705	224.625	224.185	224.088	224.080	224.269	224.049	224.270	224.862

4. Preferred Alignment

Based on the most recent information gathered from the Design Team and EA Team, the preferred alignment for Kennedy STS is N1 + S2. **Figure 4.1** shows the preferred alignment and connection points for Kennedy STS. Please note that a new connection in the Kennedy STS is introduced at Kennedy Road and Vodden Street (Connection Point 4A). This new connection point is required to facilitate the preferred wastewater servicing strategy for Brampton MTSA study.

Figure 4.1: Preferred Alignment and Connection Points for Kennedy STS (N1 + S2)



In addition, the elevation profile for Kennedy STS was revised to address the following boundary conditions / updated information.

1. Invert elevation for the downstream connection point for Kennedy STS at Etobicoke Creek STS and Kennedy Road is confirmed to be at 174 m.
2. Based on the as-constructed information for the recently designed William Parkway Water Sub Transmission Main (STM), the invert and obvert elevations for the William Parkway STM (1500 mm O.D.) are 194.74 m and

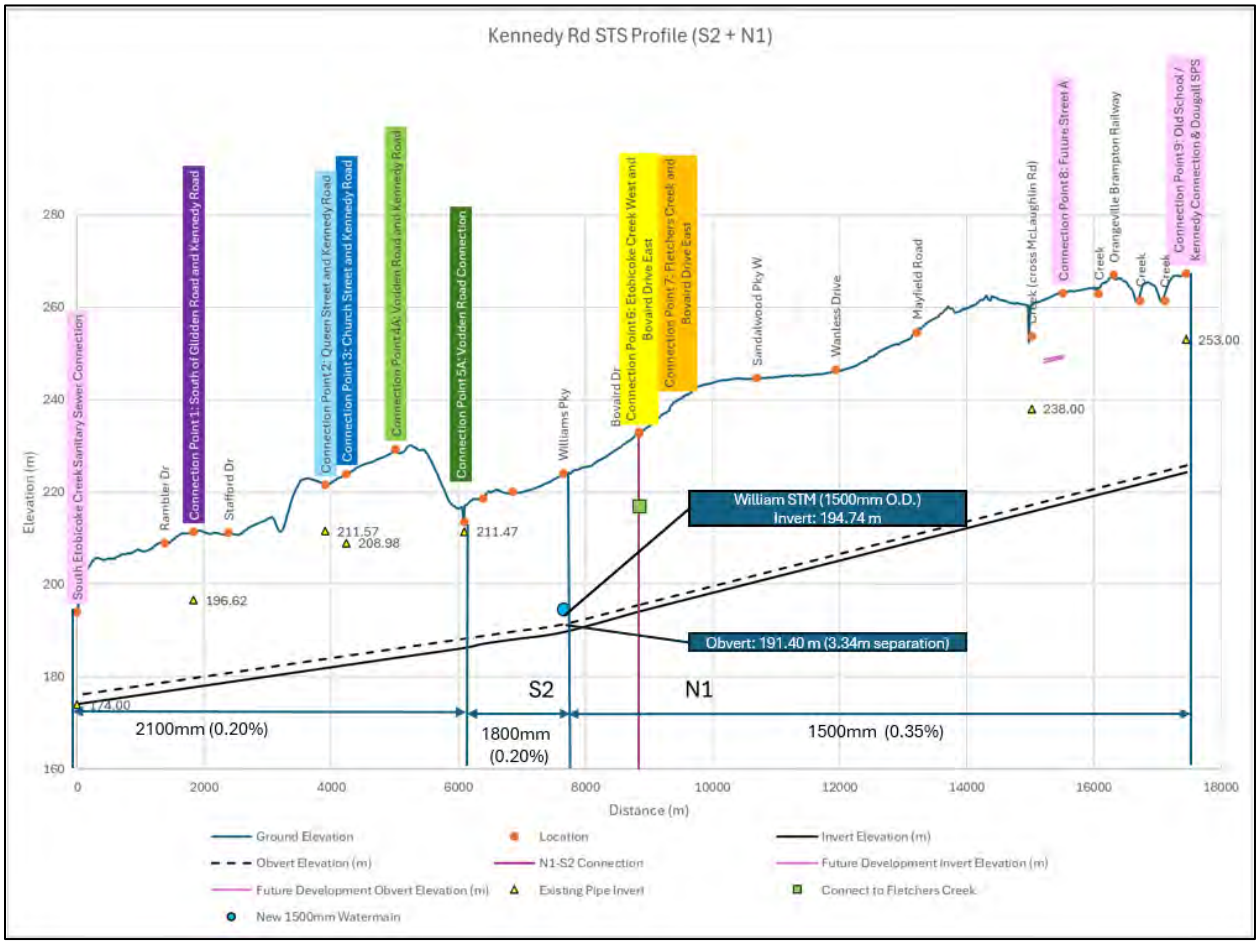
196.24 m, respectively. To avoid conflicts with the William Parkway STM, two profile options should be considered for the future Kennedy STS.

a) Option 1: Maintain the profile of Kennedy STS at below 194.74 m.

   i. The obvert elevation of the Kennedy STS should be at 191.44 m to maintain a separate distance of 3.3 m.

   ii. Slope for the Kennedy STS from downstream connection point to William Parkway must be reduced and the size of the Kennedy STS for this segment must be increased to provide similar capacity. See Figure 4.2 below.

Figure 4.2: Profile for Routing Option N1 + S2 (Option 1)



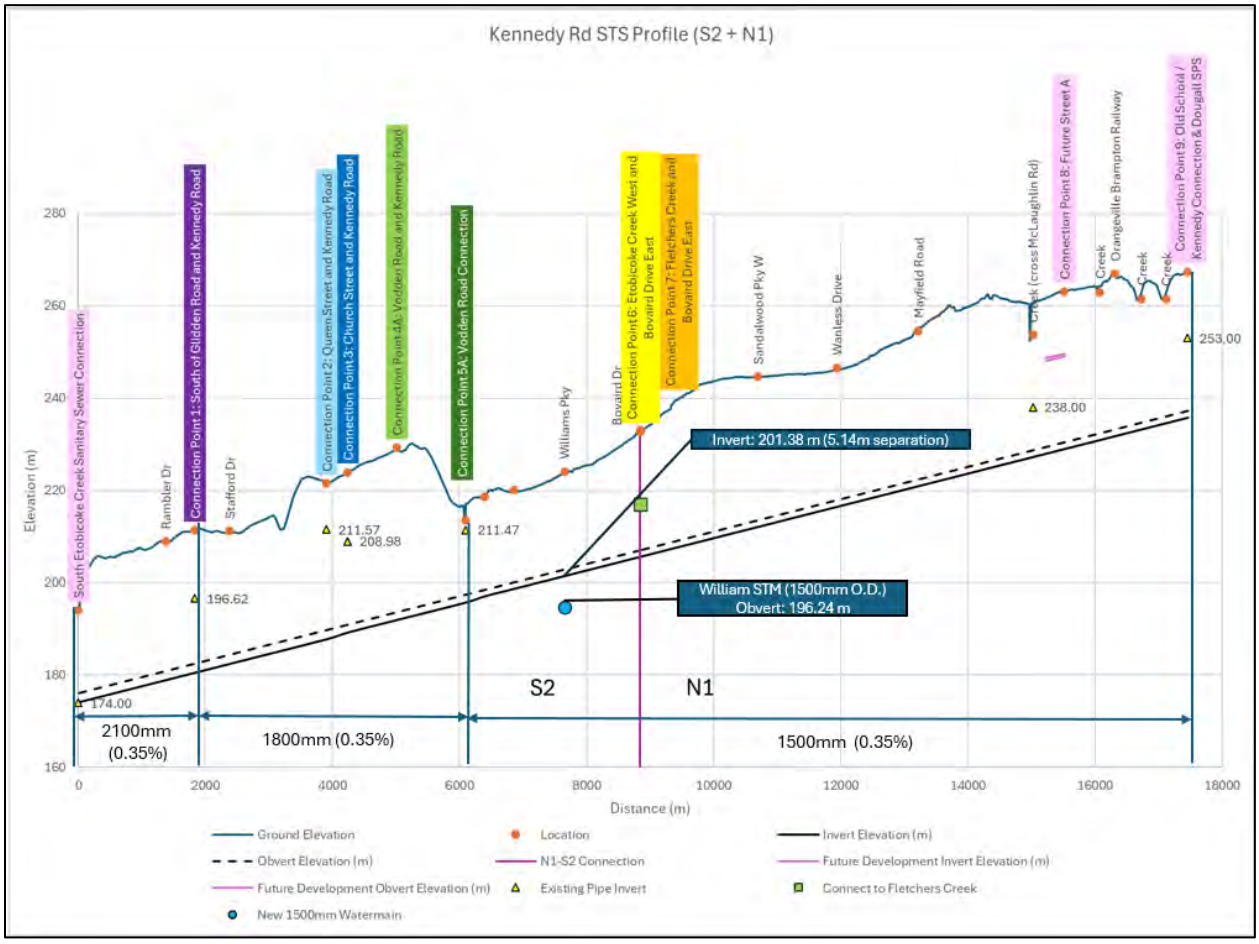
b) Option 2: Maintain the profile of Kennedy STS at above 196.24 m.

   i. The invert elevation of the Kennedy STS should be at 199.54 m to maintain a separate distance of 3.3 m.

ii. Slope of the Kennedy STS would be increased, and size of the Kennedy STS could be reduced. See **Figure 4.3** below.

iii. Since the depth of the Kennedy STS will be reduced for this option, the opportunity for downsizing the future Church Street Gravity Sewer could be limited.

Figure 4.3: Profile for Routing Option N1 + S2 (Option 2)

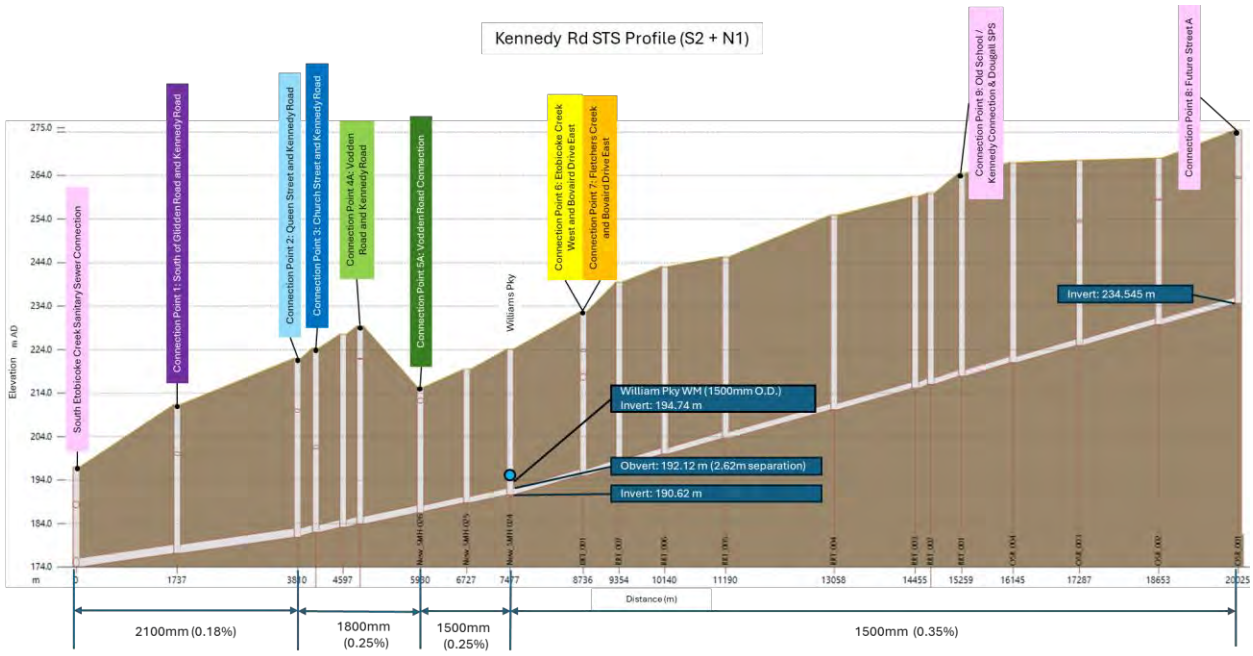


Based on input from the Design Team and the EA Team, if Option 1 is adopted, the separation between the William Parkway STM and the Kennedy STS could be reduced. By adjusting the pipe slope while keeping the originally proposed pipe size, the sewer design criteria outlined in **Section 3.3** can still be met. **Figure 4.4** presents the proposed slope and size of the Kennedy STS. The plan and profile for the Kennedy STS presented in **Figure 4.4** was developed based on the following considerations:

- Adjustment to the slope of the Kennedy STS for maintaining the size as those identified during the alignment evaluation

- The size of tunnel casting for William Parkway STM was 2.4 metre
  - Current estimated separation was based on the elevation difference between Kennedy STS obvert elevation and William Parkway STM invert elevation and the current estimated separation distance was 2.62 m
  - Slope adjustment and/or size revision could be required if the tunnelling design for William Parkway STM be modified (e.g., tunnel size increase)

Figure 4.4: Profile for Routing Option N1 + S2 (Option 1)



Based on the current hydraulic model which was updated with the Region's 2051 Scenario 2 population projection, the peak flows in the Kennedy STS through each connection points are summarized in Table 4.1. Please note that the Kennedy STS will divert the sanitary sewer flows from the existing Fletcher Creek STS and Etobicoke Creek STS at Bovaird Drive West and Vodden Street, respectively, and therefore, the peak flows in these two STS will be reduced. To support the Region's ongoing detailed design for Etobicoke Creek STS, the simulated peak flows in these STS are also included in the table below.

Table 4.1: Design Flows for Kennedy STS

Connection No.	Location	Inflow (L/s)	Accumulated Flow (L/s)	Proposed Size (mm)	
				Option 1	Option 2
0 (SND-6337990.1)	Existing 1050 mm Etobicoke STS (1) Upstream of Kennedy STS connection Point	1,437	N/A	N/A	N/A
0 (SND-1781512.1)	Existing 1050 mm Etobicoke STS (2) Upstream of Kennedy STS connection Point	538	N/A	N/A	N/A
1	South of Glidden Road and Kennedy Road	865	5,652*	2,100	2,100
2	Queen Street and Kennedy Road	537	4,767*	2,100	2,100
3	Church Street and Kennedy Road	458	4,230*	2,100	1,800
4A	Vodden Road and Kennedy Road	131	3,772	2,100	1,800
5A	Vodden Road Connection	1,125	3,641	2,100	1,800
6	Etobicoke Creek West and Bovaird Drive East	311	2,516	1,500	1,500
7	Fletchers Creek STS Diversion at Bovaird Drive East	1,150		1,500	1,500
8	Future Street A (anticipated to be implemented in 2036)	140	1,055	1,500	1,500
9	Old School Road and Hurontario Street (include Dougall SPS service area, future ICI (112.83 L/s))	915	915	1,500	1,500

*Note: * The simulated flows as per hydraulic model were lower than these value due to flow losses. These flow losses were associated with the hydraulics jumps due to the invert elevation differences between the upstream and downstream gravity sewers (e.g., > 25 m).*

5. Potential Upsizes Evaluation

As illustrated in **Figure 4.4**, the minimum hydraulically required pipe sizes for the proposed Kennedy Road STS were identified and the sizes were ranging from 1500 mm to 2100 mm based on the preliminary hydraulic analysis. Following a review by the constructability team, it was recommended that a uniform pipe size should be considered to improve construction feasibility.

To address this recommendation, additional hydraulic analysis was completed to evaluate two alternative pipe sizes, 2100 mm and 2400 mm, for the full length of the Kennedy Road STS. Hydraulic simulations were conducted for both the 2031 Dry Weather Flow (DWF) and 2051 Wet Weather Flow (WWF) scenarios to confirm that each option satisfies the Region's design criteria, including:

- Flow depth not exceeding 85% of pipe diameter under design peak flow conditions;
- Design flows versus sewerline capacity not exceeding 70%;
- Minimum Velocity at 0.75 m/s or greater under average flow conditions; and
- Maximum velocity equal to or below 3.0 m/s under peak wet weather flow conditions.

3 scenarios were developed for the hydraulic modelling simulation:

1. 2051 WWF, including Dixie Road Development (112.83 L/s additional flow);
2. 2031 DWF, including Dixie Road Development (112.83 L/s additional flow); and
3. 2031 DWF, without Dixie Road Development (112.83 L/s additional flow)

5.1 Minimum Required Sizes

Based on the hydraulic modelling results, the minimum required diameters under the 2051 Scenario 2 condition range from 1500 mm to 2100 mm. These diameters represent the smallest sizes that satisfy the Region's design criteria for velocity, flow capacity (q/Q), and depth ratio (d/D). The hydraulic results under 2051 are presented in **Appendix C – Figure C.1**, and the required pipe sizes along the Kennedy Road STS are summarized in **Appendix C – Table C.1**. The hydraulic results under 2031 (including Dixie Road Development) are presented in **Appendix C – Figure C.2**, and the required pipe sizes along the Kennedy Road STS are summarized in **Appendix C – Table C.2**.

The minimum required sizes meet all applicable design criteria under 2051 and 2031 (including Dixie Road Development) scenarios. For the last pipe segment of the

Kennedy Road STS, the depth ratio (d/D) slightly exceeds 85% under 2051 scenario due to backflow from the downstream system. This condition is expected to be resolved once the downstream section of the Kennedy Road STS is upgraded in the future.

5.2 Upsizing to 2100 mm

A uniform 2100 mm diameter was analyzed for the entire Kennedy Road STS to simplify the construction for both 2031 and 2051 scenarios. The hydraulic results under 2051 are presented in Appendix C – Figure C.3, and the required pipe sizes along the Kennedy Road STS are summarized in Appendix C – Table C.3. The hydraulic results under 2031 (including Dixie Road Development) are presented in Appendix C – Figure C.4, and the required pipe sizes along the Kennedy Road STS are summarized in Appendix C – Table C.4. The hydraulic results under 2031 (without Dixie Road Development) are presented in Appendix C – Figure C.5, and the required pipe sizes along the Kennedy Road STS are summarized in Appendix C – Table C.5.

The uniform 2100 mm diameter meets all applicable design criteria under both the 2031 (including Dixie Road Development) and 2051 scenarios. At the downstream end of the Kennedy Road STS, the depth ratio (d/D) slightly exceeds 85% under the 2051 scenario as a result of backflow from the downstream system. This condition is anticipated to be mitigated following future upgrades to the downstream section of the Kennedy Road STS.

As the exact implementation date of the Dixie Road Development is not yet confirmed, the results demonstrate that the minimum self-cleansing velocity can be achieved when the development is in place. Without the Dixie Road Development in operation by 2031, the minimum velocity under low-flow conditions is estimated at approximately 0.6 m/s (refer to Figure C.5), which is slightly below the design criterion of 0.75 m/s. In this case, flushing will be required to prevent potential sediment and solid accumulation within the sanitary sewer until the Dixie Road Development is implemented.

5.3 Upsizing to 2400 mm

A uniform 2400 mm diameter was also analyzed for the entire Kennedy Road STS for both 2031 and 2051 scenarios. The hydraulic results under 2051 are presented in Appendix C – Figure C.6, and the required pipe sizes along the Kennedy Road STS are summarized in Appendix C – Table C.6. The hydraulic results under 2031 (including Dixie Road Development) are presented in Appendix C – Figure C.7, and the required pipe sizes along the Kennedy Road STS are summarized in Appendix C – Table C.7. The hydraulic results under 2031 (without Dixie Road Development) are presented in Appendix C – Figure C.8, and the required pipe sizes along the Kennedy Road STS are summarized in Appendix C – Table C.8.

The uniform 2400 mm diameter meets all applicable design criteria under both the 2031 (including Dixie Road Development) and 2051 scenarios. The depth ratio (d/D) of the last pipe segment of the Kennedy Road STS is below 85% under the 2051 scenario.

Similar to the 2100 mm case, the results show that the minimum self-cleansing velocity can be achieved once the Dixie Road Development is implemented. Without the development in place by 2031, the minimum velocity under low-flow conditions is approximately 0.53 m/s (refer to **Figure C.8**), which is below the design criterion of 0.75 m/s. In this condition, flushing will also be required to mitigate sediment and solid accumulation within the sanitary sewer until the Dixie Road Development is implemented.

5.4 Discussion

The hydraulic analysis demonstrates that all evaluated sizing options, including the minimum required diameters (1500 mm to 2100 mm), a uniform 2100 mm pipe, and a uniform 2400 mm pipe, can satisfy the Region's design criteria for flow capacity, velocity, and depth ratio under both the 2031 (including Dixie Road Development) and 2051 scenarios.

However, under the 2031 scenario without the Dixie Road Development, the minimum self-cleansing velocity of 0.75 m/s cannot be maintained for either the 2100 mm or 2400 mm pipe. This may result in sediment and solid accumulation within the sewer. 2 potential approaches may be considered to address this condition:

a) Construct the 2100 mm or 2400 mm sewer and conduct flushing to maintain self-cleansing velocity until the Dixie Road Development is implemented; or

b) Construct the Kennedy Road STS using the minimum required pipe sizes to maintain flow velocity.

6. Potential Project Interfaces

The construction and implementation of the Kennedy Road STS may interface with other existing or planned infrastructure projects within the study area. Identifying these potential interfaces at the preliminary design stage is essential to minimize conflicts, optimize construction sequencing, and ensure overall project co-ordination. Table 6.1 outlines the key infrastructure projects and utilities that may intersect or interact with the proposed Kennedy Road STS alignment.

Table 6.1: Key Infrastructure Projects and Utilities

No.	Project / Infrastructure	Type of Interface	Location	Potential Impact on Kennedy Rd STS	References	Remarks
1	Hurontario Employment Secondary Plan Area	Crossing / Alignment Conflict	Hurontario Street and Old School (Connection Point 9)	Potential vertical conflict with proposed STS profile	Appendix D Appendix D-1	Maximum obvert level has been considered
2	Dixie Road Development	Additional Sanitary Flow	Upstream of Kennedy Rd STS (Connection 9)	Affects hydraulic capacity and minimum velocity	Appendix D Appendix D-2	Additional 112.83 L/s has been added to the model for simulation
3	Caledon Flow Program	Crossing / Alignment Conflict	Hurontario Street and Old School (Connection Point 9)	Potential vertical conflict with proposed STS profile	Appendix D Appendix D-3	It will be considered under detail design stage
4	Mayfield SPS Works	Crossing / Alignment Conflict	Street A (Connection Point 8)	Potential vertical conflict with proposed STS profile	Appendix D Appendix D-4	Maximum obvert level has been considered
5	William Parkway Water Sub-Transmission Main	Crossing / Alignment Conflict	William Parkway and OBR	Potential vertical conflict with proposed STS profile	Section 4	It has been considered

7. Next Step

This technical memorandum summarizes the design flows for Kennedy Road Sanitary Trunk Sewers (Kennedy Rd STS) for evaluating the routing options and connection options. The information presented herein will provide sufficient information for the design team. The design team should review the pros and cons for the two elevation profile options for Kennedy STS for avoiding any conflicts with the William Parkway Water Sub Transmission Main. In addition, the team should review the pipe sizing assessment to confirm the final design sizes for the Kennedy Road STS.

A potential project interface with the Caledon Flow Program has been identified by the Region. This interface will be reviewed during the detailed design stage to avoid any alignment conflicts with the Kennedy Road STS.

Flow
Building our future, faster.

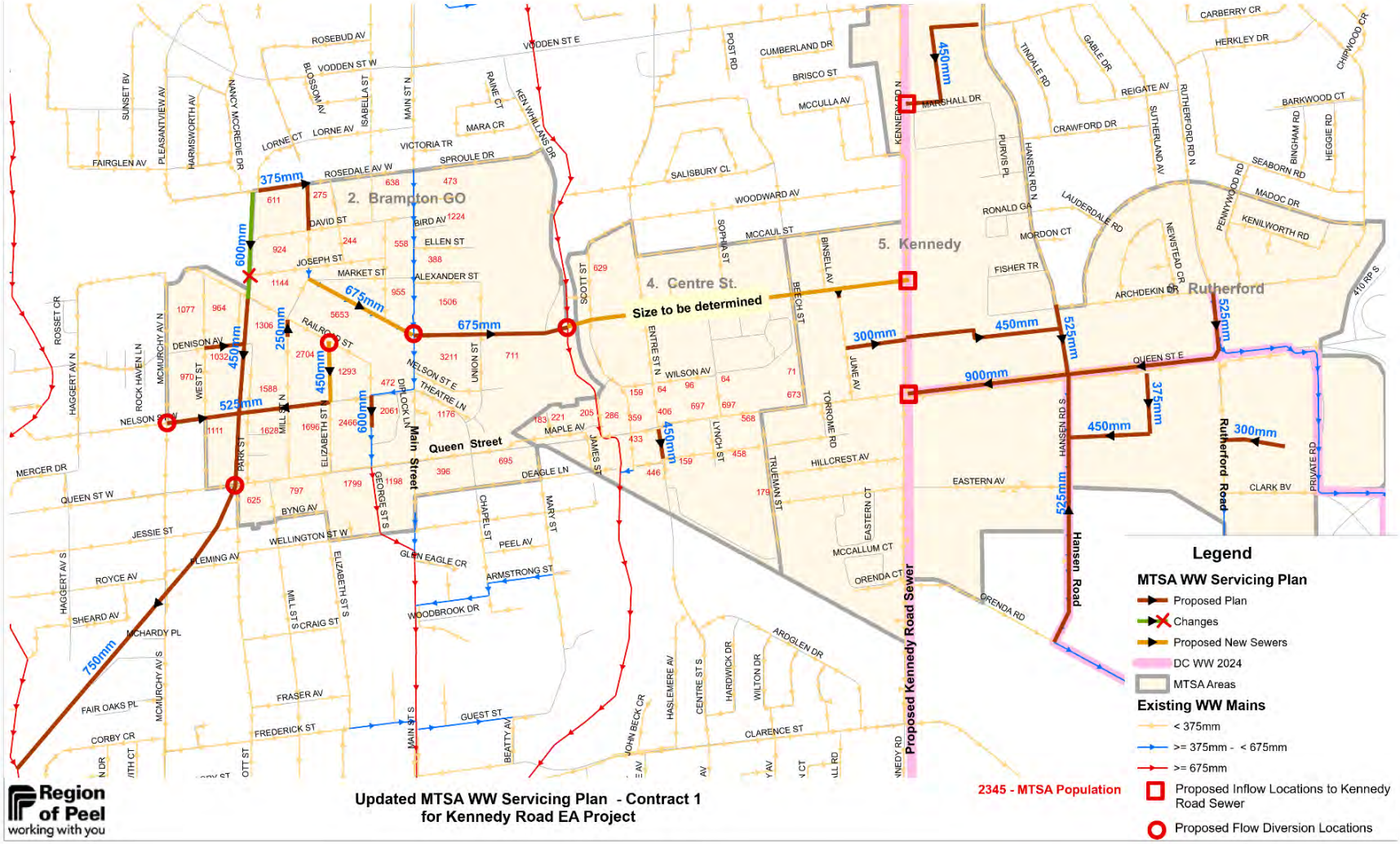
Central Brampton

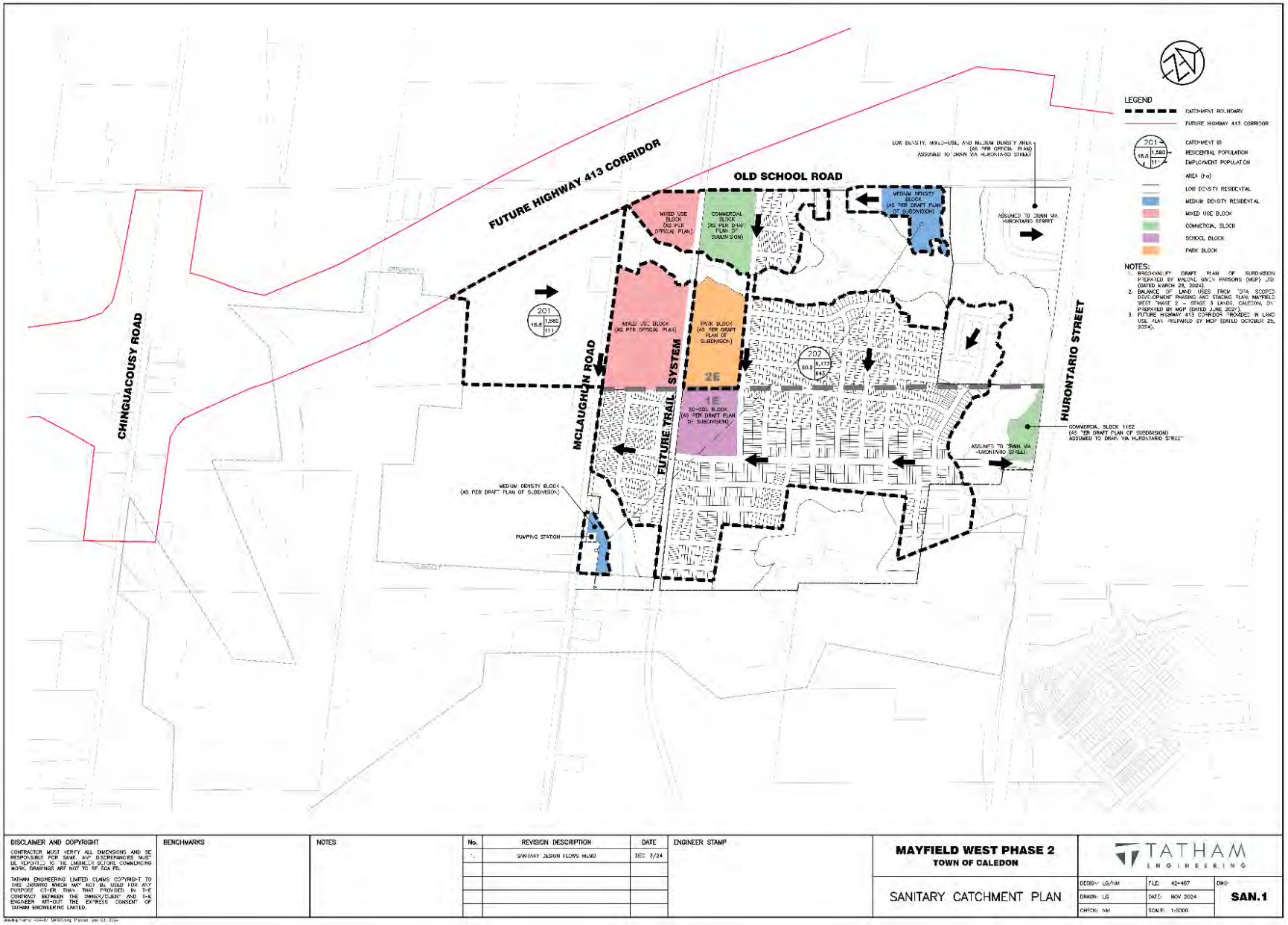
Appendix A

Downtown Brampton Servicing Concept

AECOM

Peel Region


2. Brampton GO
4. Centre St.
5. Kennedy
Rutherford
Size to be determined
Queen Street
Main Street
Hansen Road
Proposed Kennedy Road Sewer
Rutherford Road
375mm
600mm
675mm
450mm
525mm
300mm
900mm
250mm
750mm
Legend
MTSA WW Servicing Plan
Proposed Plan
Changes
Proposed New Sewers
DC WW 2024
MTSA Areas
Existing WW Mains
< 375mm
>= 375mm - < 675mm
>= 675mm
Proposed Inflow Locations to Kennedy Road Sewer
Proposed Flow Diversion Locations
2345 - MTSA Population
Region of Peel
working with you
Updated MTSA WW Servicing Plan - Contract 1
for Kennedy Road EA Project



DISCLAIMER AND COPYRIGHT	BENCHMARKS	NOTES	No.	REVISION DESCRIPTION	DATE	ENGINEER STAMP
CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE UNDERSIGNED BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED. TATHAM ENGINEERING LIMITED CLAIMS COPYRIGHT TO THIS DRAWING WHICH MAY NOT BE USED FOR ANY PURPOSE OTHER THAN THAT PROVIDED IN THE CONTRACT BETWEEN THE OWNER/CLIENT AND THE ENGINEER WITHOUT THE EXPRESS CONSENT OF TATHAM ENGINEERING LIMITED.			1.	SANITARY DESIGN FLOWS MEMO	DEC 3/24	

MAYFIELD WEST PHASE 2 TOWN OF CALEDON	TATHAM ENGINEERING		
SANITARY CATCHMENT PLAN	DESIGN: LG/NM	FILE: 42467	DWG: SAN.1
	DRAWN: LG	DATE: NOV 2024	
	CHECK: NM	SCALE: 1:5000	

Flow
Building our future, faster.

Central Brampton

Appendix B

Design Flow Evaluation Results

AECOM

Peel Region

Table B.1: N1/N2 + S1 (Method 1 – Region's Design Criteria)

Location of Connection	9 Old School / Kennedy Connection	9 Dougall SPS	8 Future Street A	7 Fletchers Creek and Bovaird Drive East	6 Etobicoke Creek West and Bovaird Drive East	5B Etobicoke Creek and Bovaird Drive East	4 Sheffield Park and Kennedy Road	3 Church Street and Kennedy Road	2 Queen Street and Kennedy Road	1 South of Glidden Road and Kennedy Road
Existing Population	-	1,377.92	TBD	48,607.01	17,493.73	60,446.24	8,843.34	39,246.41	21,767.91	17,647.82
2051 Growth	40,904.23	962.61	TBD	56,736.95	8,468.72	19,955.44	301.55	16,770.05	18,145.87	7,275.90
Total Equivalent Population	40,904.23	2,340.53	-	105,343.96	25,962.45	80,401.68	9,144.89	56,016.46	39,913.78	24,923.72
Avg. Dry Weather Flow (L/s)	134.93	7.72	-	347.49	85.64	265.21	30.17	184.78	131.66	82.21
Peaking Factor	2.35	3.53	-	1.98	2.54	2.08	2.99	2.22	2.36	2.56
Area (Ha)	818.08	46.81	-	2,106.88	519.25	1,608.03	182.90	1,120.33	798.28	498.47
Inflow and infiltration allowance (L/s)	212.70	12.17	-	547.79	135.00	418.09	47.55	291.29	207.55	129.60
Design Flow (L/s)	529.34	39.44	-	1,236.34	352.47	969.65	137.84	701.31	517.86	339.81
Accumulative Design Flow (L/s)	**529.34**	**568.78**	**568.78**	**1,805.12**	**2,157.58**	**3,127.23**	**3,265.08**	**3,966.39**	**4,484.25**	**4,824.06**

Table B.2: N1/N2 + S1 (Method 2 – Modelling Results for Future (2051) Scenario)

Location of Connection	9 Old School / Kennedy Connection	9 Dougall SPS	8 Future Street A	7 Fletchers Creek and Bovaird Drive East	6 Etobicoke Creek West and Bovaird Drive East	5B Etobicoke Creek and Bovaird Drive East	4 Sheffield Park and Kennedy Road	3 Church Street and Kennedy Road	2 Queen Street and Kennedy Road	1 South of Glidden Road and Kennedy Road
Existing Population	-	1,377.92	TBD	48,607.01	17,493.73	60,446.24	8,843.34	39,246.41	21,767.91	17,647.82
2051 Growth	40,904.23	962.61	TBD	56,736.95	8,468.72	19,955.44	301.55	16,770.05	18,145.87	7,275.90
Total Equivalent Population	40,904.23	2,340.53	-	105,343.96	25,962.45	80,401.68	9,144.89	56,016.46	39,913.78	24,923.72
Peak WWF (from 2051 Scenario Model) (L/s)	799.09	36.60	-	1,150.95	322.43	817.29	58.39	502.26	468.96	580.93
Accumulative Design Flow (from Model) (L/s)	**799.09**	**835.69**	**835.69**	**1,986.63**	**2,309.06**	**3,126.35**	**3,184.74**	**3,687.00**	**4,155.96**	**4,736.90**

Table B.3: N1/N2 + S2 (without Connection No. 6) (Method 1 – Region's Design Criteria)

Location of Connection	9 Old School / Kennedy Connection	9 Dougall SPS	8 Future Street A	7 Fletchers Creek and Bovaird Drive East	5A Vodden Road Connection	3 Church Street and Kennedy Road	2 Queen Street and Kennedy Road	1 South of Glidden Road and Kennedy Road
Existing Population	-	1,377.92	TBD	48,607.01	117,072.16	8,957.56	21,767.91	17,647.82
2051 Growth	40,904.23	962.61	TBD	56,736.95	36,888.57	8,607.19	18,145.87	7,275.90
Total Equivalent Population	40,904.23	2,340.53	-	105,343.96	153,960.73	17,564.75	39,913.78	24,923.72
Avg. Dry Weather Flow (L/s)	134.93	7.72	-	347.49	507.86	57.94	131.66	82.21
Peaking Factor	2.35	3.53	-	1.98	1.85	2.71	2.36	2.56
Area (Ha)	818.08	46.81	-	2,106.88	3,079.21	351.30	798.28	498.47
Inflow and infiltration allowance (L/s)	212.70	12.17	-	547.79	800.60	91.34	207.55	129.60
Design Flow (L/s)	529.34	39.44	-	1,236.34	1,741.77	248.31	517.86	339.81
Accumulative Design Flow (L/s)	**529.34**	**568.78**	**568.78**	**1,805.12**	**3,546.89**	**3,795.20**	**4,313.06**	**4,652.87**

Table B.4: N1/N2 + S2 (without Connection No. 6) (Method 2 – Modelling Results for Future (2051) Scenario)

Location of Connection	9 Old School / Kennedy Connection	9 Dougall SPS	8 Future Street A	7 Fletchers Creek and Bovaird Drive East	5A Vodden Road Connection	3 Church Street and Kennedy Road	2 Queen Street and Kennedy Road	1 South of Glidden Road and Kennedy Road
Existing Population	-	1,377.92	TBD	48,607.01	117,072.16	8,957.56	21,767.91	17,647.82
2051 Growth	40,904.23	962.61	TBD	56,736.95	36,888.57	8,607.19	18,145.87	7,275.90
Total Equivalent Population	40,904.23	2,340.53	-	105,343.96	153,960.73	17,564.75	39,913.78	24,923.72
Peak WWF (from 2051 Scenario Model) (L/s)	799.09	36.60	-	1,150.95	1,631.53	174.94	468.96	580.93
Accumulative Design Flow (from Model) (L/s)	**799.09**	**835.69**	**835.69**	**1,986.63**	**3,618.16**	**3,793.10**	**4,262.07**	**4,843.00**

Table B.5: N1/N2 + S2 (with Connection No. 6) (Method 1 – Region's Design Criteria)

Location of Connection	9 Old School / Kennedy Connection	9 Dougall SPS	8 Future Street A	7 Fletchers Creek and Bovaird Drive East	6 Etobicoke Creek West and Bovaird Drive East	5A Vodden Road Connection	3 Church Street and Kennedy Road	2 Queen Street and Kennedy Road	1 South of Glidden Road and Kennedy Road
Existing Population	-	1,377.92	TBD	48,607.01	17,493.73	99,578.43	8,957.56	21,767.91	17,647.82
2051 Growth	40,904.23	962.61	TBD	56,736.95	8,468.72	28,419.85	8,607.19	18,145.87	7,275.90
Total Equivalent Population	40,904.23	2,340.53	-	105,343.96	25,962.45	127,998.28	17,564.75	39,913.78	24,923.72
Avg. Dry Weather Flow (L/s)	134.93	7.72	-	347.49	85.64	422.22	57.94	131.66	82.21
Peaking Factor	2.35	3.53	-	1.98	2.54	1.91	2.71	2.36	2.56
Area (Ha)	818.08	46.81	-	2,106.88	519.25	2,559.97	351.30	798.28	498.47
Inflow and infiltration allowance (L/s)	212.70	12.17	-	547.79	135.00	665.59	91.34	207.55	129.60
Design Flow (L/s)	529.34	39.44	-	1,236.34	352.47	1,473.81	248.31	517.86	339.81
Accumulative Design Flow (L/s)	**529.34**	**568.78**	**568.78**	**1,805.12**	**2,157.58**	**3,631.39**	**3,879.69**	**4,397.55**	**4,737.37**

Table B.6: N1/N2 + S2 (with Connection No. 6) (Method 2 – Modelling Results for Future (2051) Scenario)

Location of Connection	9 Old School / Kennedy Connection	9 Dougall SPS	8 Future Street A	7 Fletchers Creek and Bovaird Drive East	6 Etobicoke Creek West and Bovaird Drive East	5A Vodden Road Connection	3 Church Street and Kennedy Road	2 Queen Street and Kennedy Road	1 South of Glidden Road and Kennedy Road
Existing Population	-	1,377.92	TBD	48,607.01	17,493.73	99,578.43	8,957.56	21,767.91	17,647.82
2051 Growth	40,904.23	962.61	TBD	56,736.95	8,468.72	28,419.85	8,607.19	18,145.87	7,275.90
Total Equivalent Population	40,904.23	2,340.53	-	105,343.96	25,962.45	127,998.28	17,564.75	39,913.78	24,923.72
Peak WWF (from 2051 Scenario Model) (L/s)	799.09	36.60	-	1,150.95	322.43	1,309.11	174.94	468.96	580.93
Accumulative Design Flow (from Model) (L/s)	**799.09**	**835.69**	**835.69**	**1,986.63**	**2,309.06**	**3,618.16**	**3,793.10**	**4,262.07**	**4,843.00**

Flow
Building our future, faster.

Central Brampton

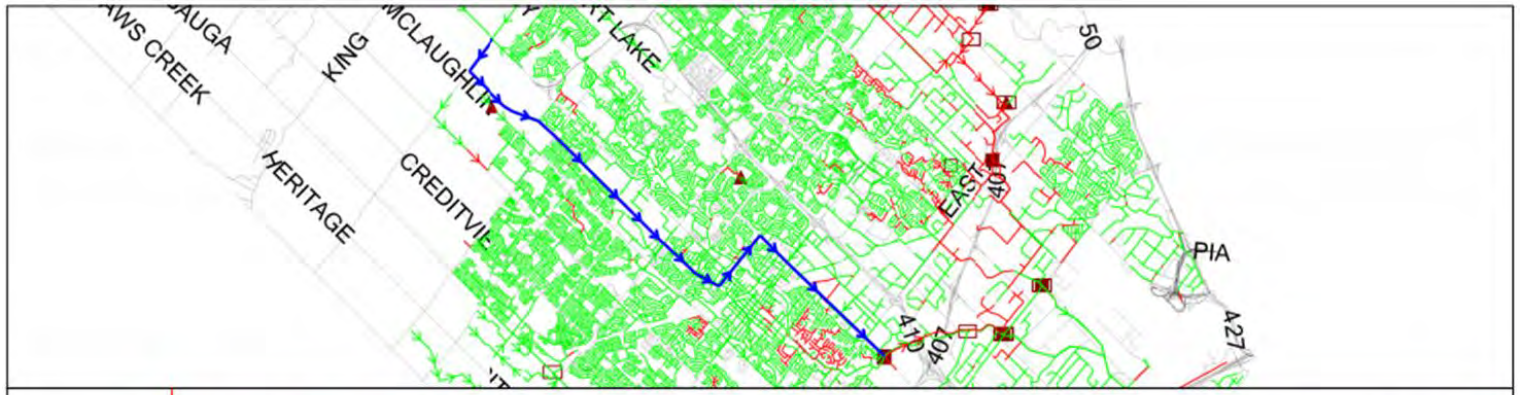
Appendix C

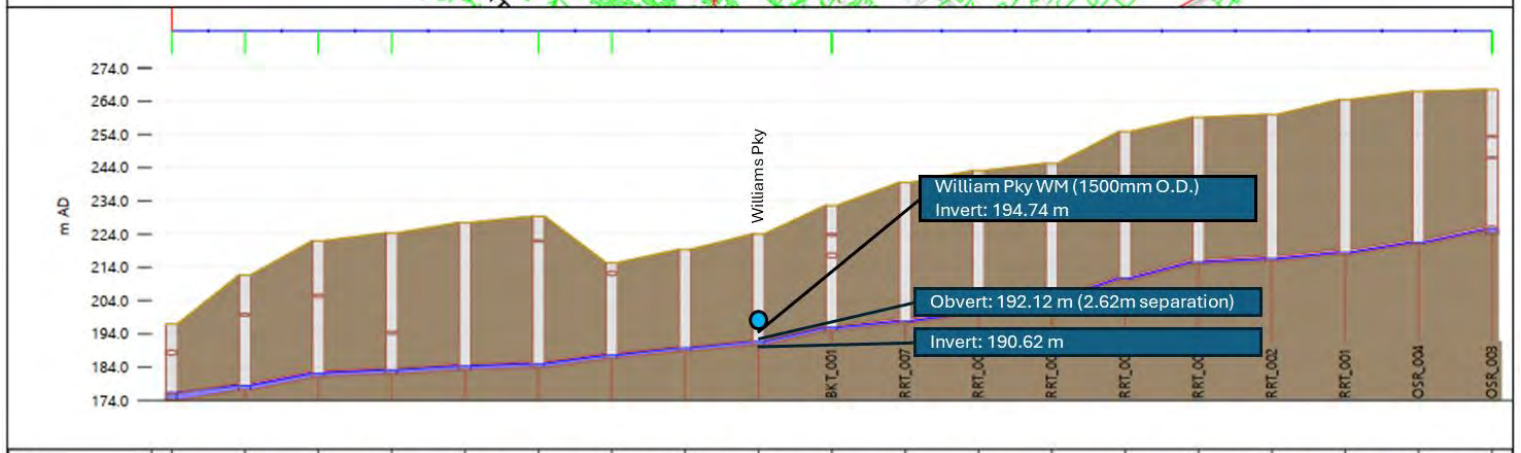
Hydraulic Modelling Results

AECOM

Peel Region

Figure C.1: Hydraulic Modelling Results for 2051 Peak WWF – 1500 mm to 2100 mm



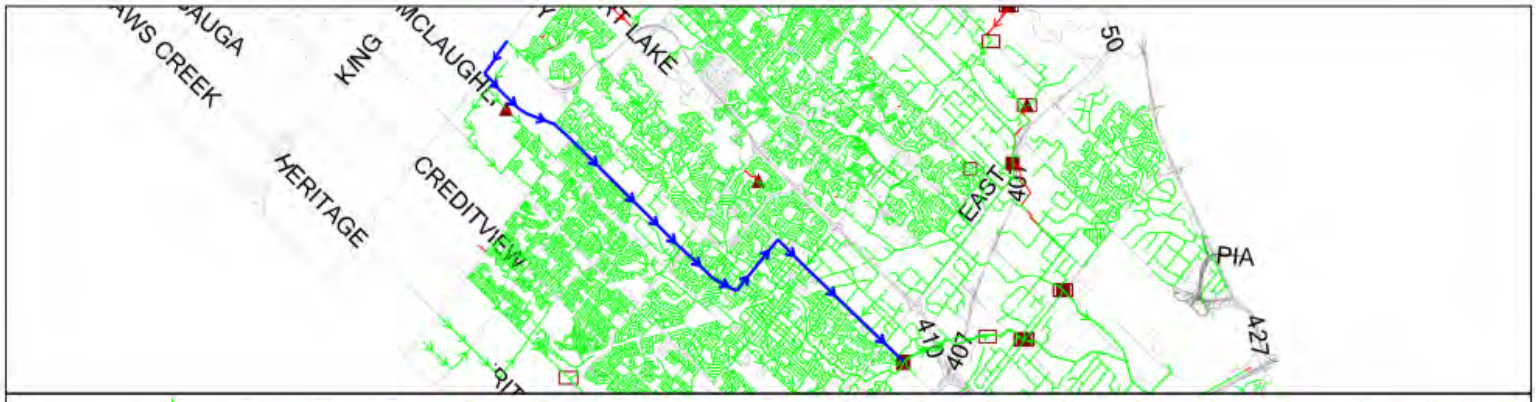


Link	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
width (mm)	2100	2100	1800	1800	1800	1800	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
height (mm)	2100	2100	1800	1800	1800	1800	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
length (m)	1724.5	2085.6	314.6	472.0	292.1	1041.3	797.0	749.4	1259.5	618.1	785.5	1050.6	1867.8	1396.9	271.1	532.4	886.9	1141.9		
inflow (l/s)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	140.00	0.00	112.83		
grad (%)	0.181	0.179	0.250	0.250	0.250	0.250	0.250	0.250	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350		
us inv (m AD)	177.126	180.858	181.945	183.125	183.855	186.458	188.751	190.624	195.032	197.196	199.945	203.622	210.159	215.049	215.997	217.861	220.965	224.962		
ds inv (m AD)	174.000	177.126	181.158	181.945	183.125	183.855	186.758	188.751	190.624	195.032	197.196	199.945	203.622	210.159	215.049	215.997	217.861	220.965		
surc	1.00	0.61	0.61	0.61	0.59	0.59	0.63	0.64	0.64	0.57	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.33		
DS flow (l/s)	4880.85	4317.81	3967.98	3722.20	3720.90	3658.81	2540.77	2541.50	2542.40	1086.79	1084.38	1084.64	1084.99	1085.62	1086.13	1086.23	946.43	806.20		
DS velocity (m/s)	1.964	2.007	2.777	2.303	2.370	2.334	2.545	2.147	2.146	1.199	1.959	1.959	1.959	1.960	1.961	1.959	1.704	1.609		
expr:q/Q	0.661072	0.588596	0.690092	0.647540	0.647433	0.636556	0.718655	0.719054	0.607877	0.259799	0.259271	0.259329	0.259410	0.259537	0.259784	0.259668	0.226276	0.192741		
Node	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
expr:Freeboard	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table C.1: Hydraulic Modelling Results for 2051 Peak WWF – 1500 mm to 2100 mm

Connection No.	Location	Proposed Diameter (mm)	Velocity	Flow Depth (d/D)	Flow Capacity (q/Q)
1	South of Glidden Road and Kennedy Road	2100	Between 0.75 m/s and 3.0 m/s	Higher than 85%, backflow water from downstream of the Kennedy Road STS	Below 70%
2	Queen Street and Kennedy Road	2100	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
3	Church Street and Kennedy Road	1800	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
4A	Vodden Road and Kennedy Road	1800	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
5A	Vodden Road Connection	1800	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
6	Etobicoke Creek West and Bovaird Drive East	1500	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
7	Fletchers Creek STS Diversion at Bovaird Drive East	1500	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
8	Future Street A	1500	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
9	Old School Road and Hurontario Street (include Dougall SPS service area, future ICI (112.83 L/s))	1500	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%

Figure C.2: Hydraulic Modelling Results for 2031 DWF (Low Flow) – 1500 mm to 2100 mm

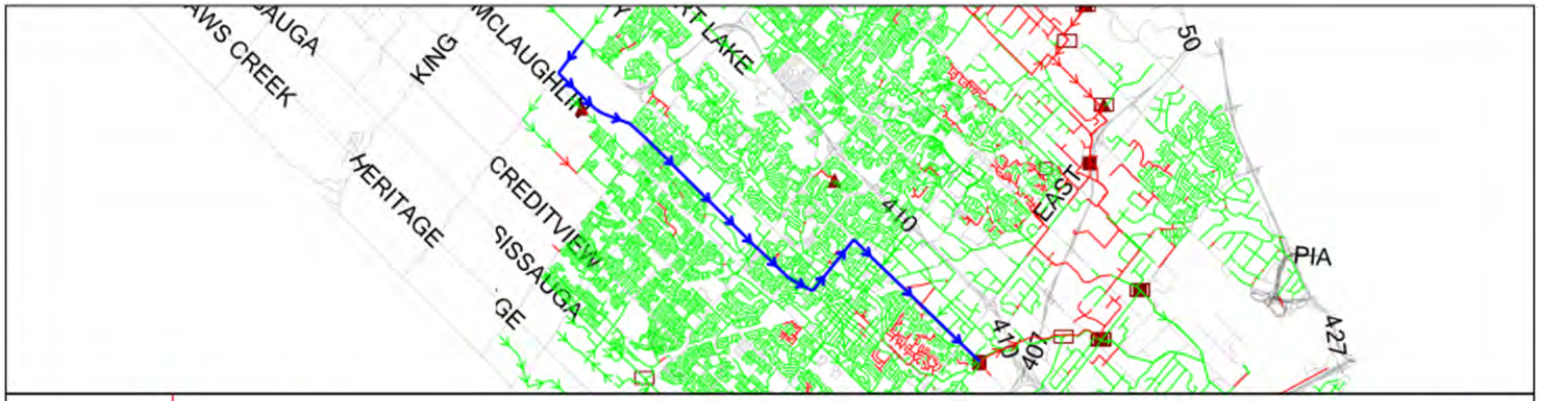


Link	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
width (mm)	2100	2100	1800	1800	1800	1800	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
height (mm)	2100	2100	1800	1800	1800	1800	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
length (m)	1724.5	2085.6	314.6	472.0	292.1	1041.3	797.0	749.4	1259.5	618.1	785.5	1050.6	1867.8	1396.9	271.1	532.4	886.9	1141.9	
inflow (l/s)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.83
grad (%)	0.181	0.179	0.250	0.250	0.250	0.250	0.250	0.250	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350
us inv (m AD)	177.126	180.858	181.945	183.125	183.855	186.458	188.751	190.624	195.032	197.196	199.945	203.622	210.159	215.049	215.997	217.861	220.965	224.962	
ds inv (m AD)	174.000	177.126	181.158	181.945	183.125	183.855	186.758	188.751	190.624	195.032	197.196	199.945	203.622	210.159	215.049	215.997	217.861	220.965	
surc	0.25	0.24	0.26	0.26	0.26	0.26	0.29	0.29	0.29	0.26	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	
DS flow (l/s)	915.20	861.39	827.54	811.68	809.74	803.06	610.79	610.09	611.24	186.97	186.65	186.60	186.54	186.48	186.44	186.43	186.42	186.40	
DS velocity (m/s)	1.333	1.341	1.698	1.539	1.556	1.545	1.623	1.468	1.469	0.506	1.108	1.108	1.108	1.108	1.108	1.107	1.106	1.105	
expr:q/Q	0.123956	0.117423	0.143923	0.141206	0.140894	0.139716	0.172763	0.172609	0.146144	0.044697	0.044627	0.044614	0.044600	0.044581	0.044593	0.044568	0.044569	0.044562	
Node	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
expr:Freeboard	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table C.2: Hydraulic Modelling Results for 2031 DWF (Low Flow) – 1500 mm to 2100 mm

Connection No.	Location	Proposed Diameter (mm)	Velocity	Flow Depth (d/D)	Flow Capacity (q/Q)
1	South of Glidden Road and Kennedy Road	2100	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
2	Queen Street and Kennedy Road	2100	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
3	Church Street and Kennedy Road	1800	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
4A	Vodden Road and Kennedy Road	1800	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
5A	Vodden Road Connection	1800	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
6	Etobicoke Creek West and Bovaird Drive East	1500	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
7	Fletchers Creek STS Diversion at Bovaird Drive East	1500	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
8	Future Street A	1500	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
9	Old School Road and Hurontario Street (include Dougall SPS service area, future ICI (112.83 L/s))	1500	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%

Figure C.3: Hydraulic Modelling Results for 2051 Peak WWF – 2100 mm

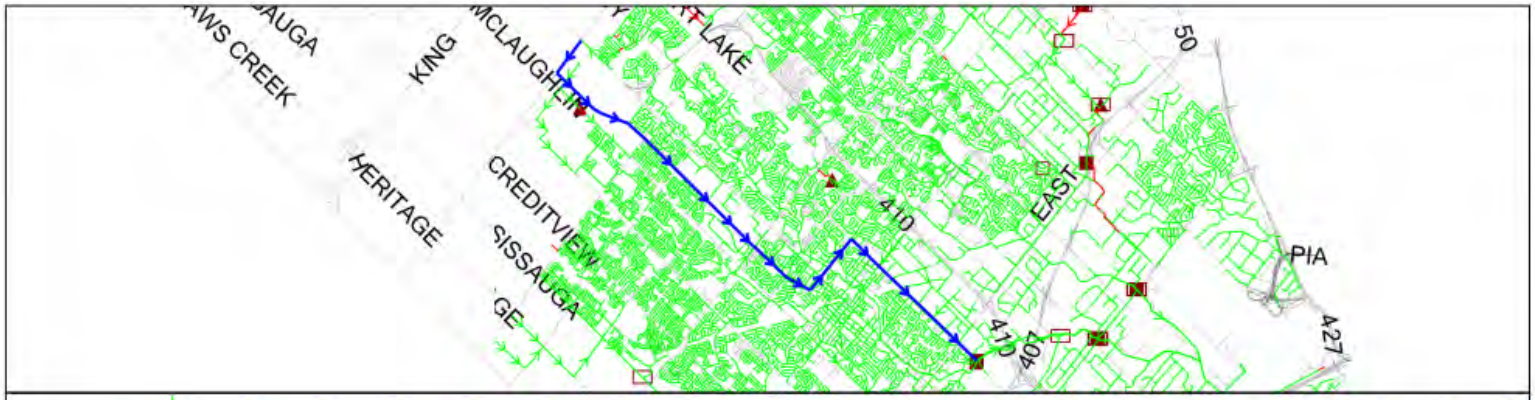


Link	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
width (mm)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
height (mm)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
length (m)	1724.5	2085.6	314.6	472.0	292.1	1041.3	797.0	749.4	1259.5	618.1	785.5	1050.6	1867.8	1396.9	271.1	532.4	886.9	1141.9	
inflow (l/s)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	140.00	0.00	112.83	
grad (%)	0.181	0.179	0.250	0.250	0.250	0.250	0.250	0.250	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	
us inv (m AD)	177.126	180.858	181.645	182.825	183.555	186.158	188.151	190.024	194.432	196.596	199.345	203.022	209.559	214.449	215.397	217.261	220.365	224.362	
ds inv (m AD)	174.000	177.126	180.858	181.645	182.825	183.555	186.158	188.151	190.024	194.432	196.596	199.345	203.022	209.559	214.449	215.397	217.261	220.365	
surc	1.00	0.61	0.56	0.48	0.46	0.46	0.46	0.37	0.37	0.34	0.22	0.22	0.22	0.22	0.22	0.23	0.23	0.21	
DS flow (l/s)	4894.98	4337.44	3982.44	3727.40	3725.83	3663.24	2544.41	2544.00	2544.56	1087.42	1085.85	1086.13	1086.51	1087.22	1087.80	1087.92	948.15	806.75	
DS velocity (m/s)	1.965	2.008	2.044	2.267	2.385	2.349	1.652	2.148	2.148	1.144	1.864	1.864	1.864	1.865	1.866	1.864	1.621	1.521	
expr:q/Q	0.662985	0.591271	0.459159	0.429881	0.429779	0.422511	0.293405	0.293437	0.248034	0.105978	0.105844	0.105870	0.105906	0.105965	0.106073	0.106028	0.092417	0.078632	
Node	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
expr:Freeboard	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table C.3: Hydraulic Modelling Results for 2051 Peak WWF – 2100 mm

Connection No.	Location	Proposed Diameter (mm)	Velocity	Flow Depth (d/D)	Flow Capacity (q/Q)
1	South of Glidden Road and Kennedy Road	2100	Between 0.75 m/s and 3.0 m/s	Higher than 85%, backflow water from downstream of the Kennedy Road STS	Below 70%
2	Queen Street and Kennedy Road	2100	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
3	Church Street and Kennedy Road	2100	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
4A	Vodden Road and Kennedy Road	2100	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
5A	Vodden Road Connection	2100	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
6	Etobicoke Creek West and Bovaird Drive East	2100	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
7	Fletchers Creek STS Diversion at Bovaird Drive East	2100	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
8	Future Street A	2100	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
9	Old School Road and Hurontario Street (include Dougall SPS service area, future ICI (112.83 L/s))	2100	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%

Figure C.4: Hydraulic Modelling Results for 2031 DWF (Low Flow) – 2100 mm

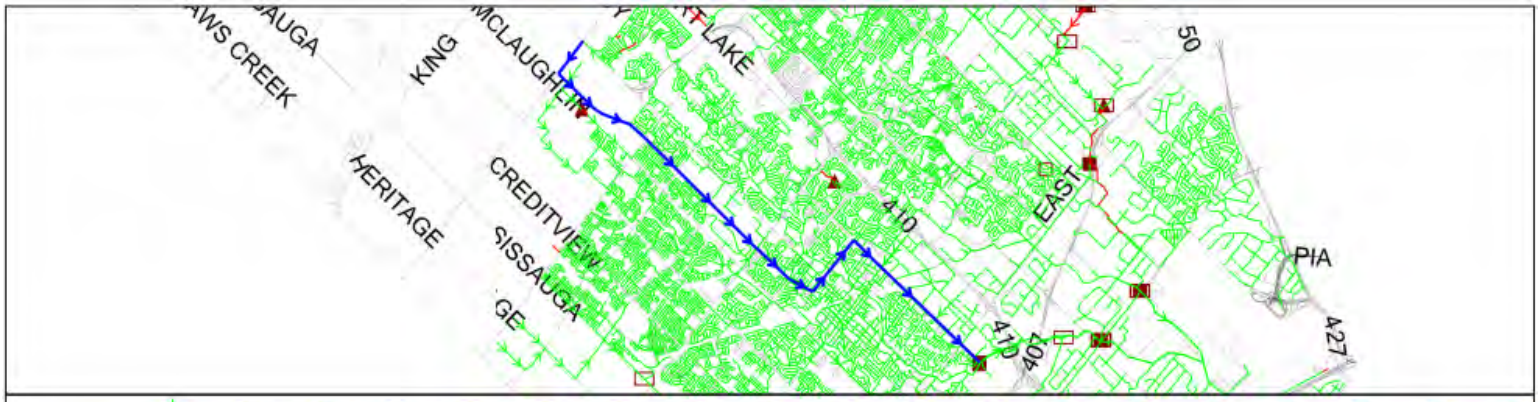


Link	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
width (mm)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
height (mm)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
length (m)	1724.5	2085.6	314.6	472.0	292.1	1041.3	797.0	749.4	1259.5	618.1	785.5	1050.6	1867.8	1396.9	271.1	532.4	886.9	1141.9	
inflow (l/s)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.83
grad (%)	0.181	0.179	0.250	0.250	0.250	0.250	0.250	0.250	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350
us inv (m AD)	177.126	180.858	181.645	182.825	183.555	186.158	188.151	190.024	194.432	196.596	199.345	203.022	209.559	214.449	215.397	217.261	220.365	224.362	
ds inv (m AD)	174.000	177.126	180.858	181.645	182.825	183.555	186.158	188.151	190.024	194.432	196.596	199.345	203.022	209.559	214.449	215.397	217.261	220.365	
surc	0.25	0.24	0.24	0.21	0.21	0.21	0.21	0.19	0.19	0.17	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	
DS flow (l/s)	915.75	861.92	827.75	811.87	809.99	803.34	611.07	610.09	611.22	186.96	186.65	186.60	186.54	186.48	186.44	186.43	186.42	186.40	
DS velocity (m/s)	1.334	1.341	1.334	1.495	1.513	1.502	1.154	1.377	1.378	0.472	0.966	0.966	0.966	0.966	0.966	0.966	0.965	0.964	
expr:q/Q	0.124030	0.117496	0.095436	0.093633	0.093433	0.092656	0.070465	0.070370	0.059579	0.018221	0.018194	0.018188	0.018183	0.018175	0.018180	0.018170	0.018170	0.018167	
Node	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
expr:Freeboard	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table C.4: Hydraulic Modelling Results for 2031 DWF (Low Flow) – 2100 mm

Connection No.	Location	Proposed Diameter (mm)	Velocity	Flow Depth (d/D)	Flow Capacity (q/Q)
1	South of Glidden Road and Kennedy Road	2100	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
2	Queen Street and Kennedy Road	2100	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
3	Church Street and Kennedy Road	2100	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
4A	Vodden Road and Kennedy Road	2100	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
5A	Vodden Road Connection	2100	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
6	Etobicoke Creek West and Bovaird Drive East	2100	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
7	Fletchers Creek STS Diversion at Bovaird Drive East	2100	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
8	Future Street A	2100	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
9	Old School Road and Hurontario Street (include Dougall SPS service area, future ICI (112.83 L/s))	2100	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%

Figure C.5: Hydraulic Modelling Results for 2031 DWF (Low Flow) – 2100 mm (without Dixie Road Development)

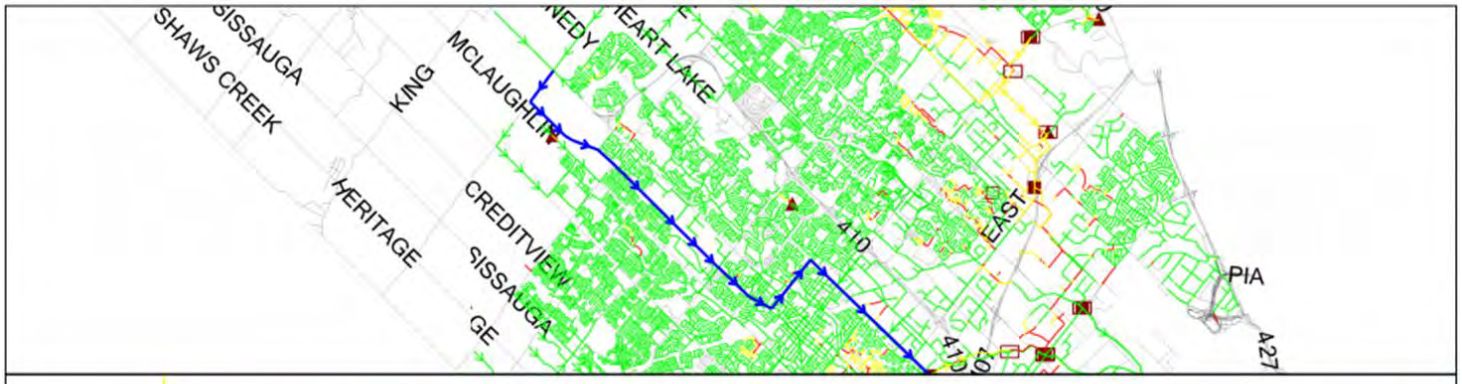


Link	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
width (mm)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
height (mm)	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100
length (m)	1724.5	2085.6	314.6	472.0	292.1	1041.3	797.0	749.4	1259.5	618.1	785.5	1050.6	1867.8	1396.9	271.1	532.4	886.9	1141.9		
inflow (l/s)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
grad (%)	0.181	0.179	0.250	0.250	0.250	0.250	0.250	0.250	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350		
us inv (m AD)	177.126	180.858	181.645	182.825	183.555	186.158	188.151	190.024	194.432	196.596	199.345	203.022	209.559	214.449	215.397	217.261	220.365	224.362		
ds inv (m AD)	174.000	177.126	180.858	181.645	182.825	183.555	186.158	188.151	190.024	194.432	196.596	199.345	203.022	209.559	214.449	215.397	217.261	220.365		
surc	0.24	0.23	0.22	0.20	0.20	0.20	0.20	0.17	0.17	0.16	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08		
DS flow (l/s)	805.08	750.69	715.25	699.47	697.84	691.34	498.88	497.33	498.47	74.29	73.96	73.88	73.78	73.68	73.63	73.62	73.60	73.57		
DS velocity (m/s)	1.281	1.277	1.269	1.421	1.440	1.428	1.042	1.283	1.284	0.214	0.602	0.601	0.601	0.601	0.600	0.600	0.600	0.600		
expr:q/Q	0.109042	0.102333	0.082466	0.080670	0.080497	0.079738	0.057528	0.057364	0.048589	0.007240	0.007209	0.007201	0.007192	0.007181	0.007180	0.007175	0.007174	0.007171		
Node	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
expr:Freeboard	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table C.5: Hydraulic Modelling Results for 2031 DWF (Low Flow) – 2100 mm (without Dixie Road Development)

Connection No.	Location	Proposed Diameter (mm)	Velocity	Flow Depth (d/D)	Flow Capacity (q/Q)
1	South of Glidden Road and Kennedy Road	2100	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
2	Queen Street and Kennedy Road	2100	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
3	Church Street and Kennedy Road	2100	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
4A	Vodden Road and Kennedy Road	2100	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
5A	Vodden Road Connection	2100	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
6	Etobicoke Creek West and Bovaird Drive East	2100	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
7	Fletchers Creek STS Diversion at Bovaird Drive East	2100	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
8	Future Street A	2100	Below 0.75 m/s	Below 85%	Below 70%
9	Old School Road and Hurontario Street (include Dougall SPS service area)	2100	Below 0.75 m/s	Below 85%	Below 70%

Figure C.6: Hydraulic Modelling Results for 2051 Peak WWF – 2400 mm

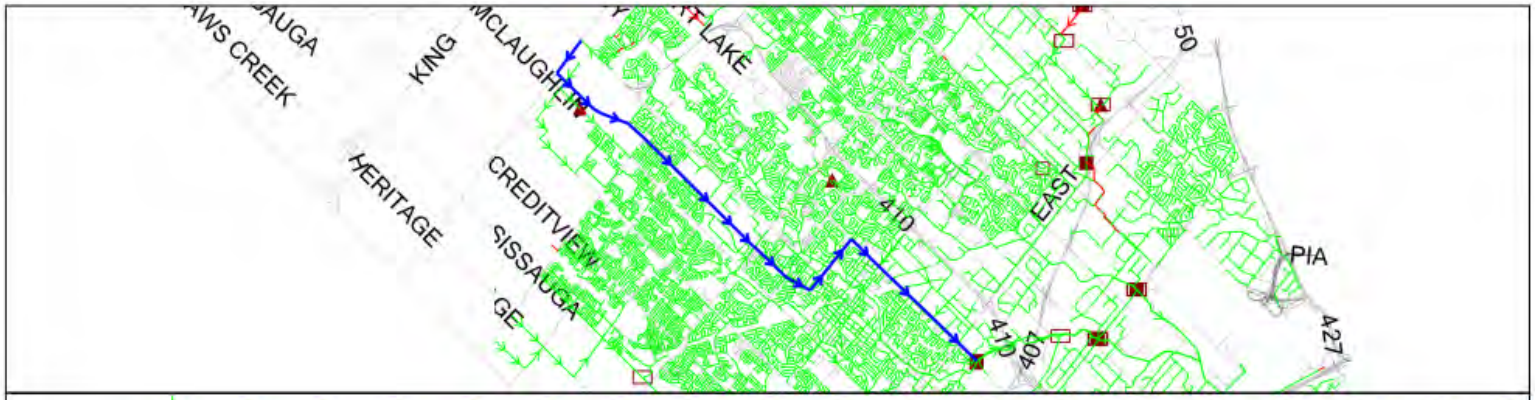


Link	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
width (mm)	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400
height (mm)	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400
length (m)	1724.5	2085.6	314.6	472.0	292.1	1041.3	797.0	749.4	1259.5	618.1	785.5	1050.6	1867.8	1396.9	271.1	532.4	886.9	1141.9	
inflow (l/s)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	140.00	0.00	112.83	
grad (%)	0.181	0.179	0.250	0.250	0.250	0.250	0.250	0.250	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	
us inv (m AD)	177.126	180.858	181.645	182.825	183.555	186.158	188.151	190.024	194.432	196.596	199.345	203.022	209.559	214.449	215.397	217.261	220.365	224.362	
ds inv (m AD)	174.000	177.126	180.858	181.645	182.825	183.555	186.158	188.151	190.024	194.432	196.596	199.345	203.022	209.559	214.449	215.397	217.261	220.365	
surc	0.94	0.49	0.45	0.40	0.38	0.38	0.38	0.31	0.31	0.29	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.18	
DS flow (l/s)	4902.26	4339.44	3982.46	3727.21	3725.83	3663.14	2544.07	2543.68	2544.22	1087.30	1085.80	1086.09	1086.49	1087.22	1087.81	1087.93	948.17	806.77	
DS velocity (m/s)	1.766	2.017	2.041	2.254	2.363	2.327	1.636	2.116	2.116	1.114	1.812	1.812	1.812	1.813	1.814	1.812	1.576	1.474	
Node	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
expr:Freeboard	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table C.6: Hydraulic Modelling Results for 2051 Peak WWF – 2400 mm

Connection No.	Location	Proposed Diameter (mm)	Velocity	Flow Depth (d/D)	Flow Capacity (q/Q)
1	South of Glidden Road and Kennedy Road	2400	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
2	Queen Street and Kennedy Road	2400	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
3	Church Street and Kennedy Road	2400	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
4A	Vodden Road and Kennedy Road	2400	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
5A	Vodden Road Connection	2400	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
6	Etobicoke Creek West and Bovaird Drive East	2400	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
7	Fletchers Creek STS Diversion at Bovaird Drive East	2400	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
8	Future Street A	2400	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
9	Old School Road and Hurontario Street (include Dougall SPS service area, future ICI (112.83 L/s))	2400	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%

Figure C.7: Hydraulic Modelling Results for 2031 DWF (Low Flow) – 2400 mm

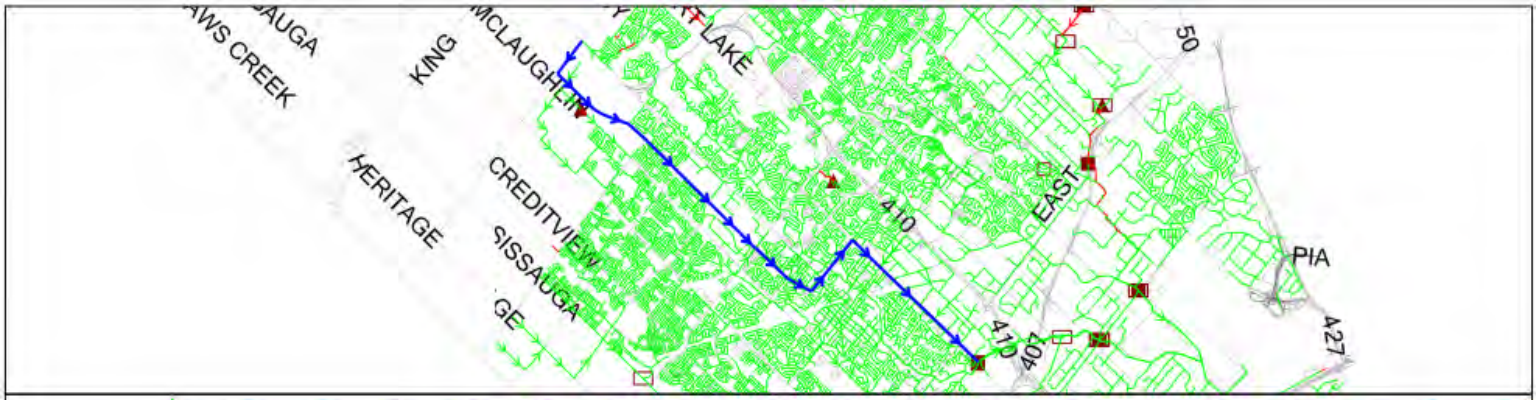


Link	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
width (mm)	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400
height (mm)	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400
length (m)	1724.5	2085.6	314.6	472.0	292.1	1041.3	797.0	749.4	1259.5	618.1	785.5	1050.6	1867.8	1396.9	271.1	532.4	886.9	1141.9	
inflow (l/s)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.83
grad (%)	0.181	0.179	0.250	0.250	0.250	0.250	0.250	0.250	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350
us inv (m AD)	177.126	180.858	181.645	182.825	183.555	186.158	188.151	190.024	194.432	196.596	199.345	203.022	209.559	214.449	215.397	217.261	220.365	224.362	
ds inv (m AD)	174.000	177.126	180.858	181.645	182.825	183.555	186.158	188.151	190.024	194.432	196.596	199.345	203.022	209.559	214.449	215.397	217.261	220.365	
surc	0.22	0.20	0.20	0.18	0.18	0.18	0.18	0.16	0.16	0.15	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	
DS flow (l/s)	916.13	862.14	827.78	811.90	810.03	803.40	611.13	610.09	611.19	186.96	186.65	186.59	186.54	186.48	186.44	186.43	186.42	186.40	
DS velocity (m/s)	1.234	1.307	1.298	1.451	1.468	1.457	1.119	1.329	1.330	0.454	0.894	0.893	0.893	0.893	0.893	0.893	0.892	0.892	
expr:q/Q	0.086909	0.082317	0.066847	0.065584	0.065445	0.064902	0.049359	0.049288	0.041728	0.012762	0.012743	0.012739	0.012735	0.012730	0.012734	0.012726	0.012727	0.012725	
Node	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
expr:Freeboard	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table C.7: Hydraulic Modelling Results for 2031 DWF (Low Flow) – 2400 mm

Connection No.	Location	Proposed Diameter (mm)	Velocity	Flow Depth (d/D)	Flow Capacity (q/Q)
1	South of Glidden Road and Kennedy Road	2400	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
2	Queen Street and Kennedy Road	2400	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
3	Church Street and Kennedy Road	2400	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
4A	Vodden Road and Kennedy Road	2400	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
5A	Vodden Road Connection	2400	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
6	Etobicoke Creek West and Bovaird Drive East	2400	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
7	Fletchers Creek STS Diversion at Bovaird Drive East	2400	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
8	Future Street A	2400	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
9	Old School Road and Hurontario Street (include Dougall SPS service area, future ICI (112.83 L/s))	2400	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%

Figure C.8: Hydraulic Modelling Results for 2031 DWF (Low Flow) – 2400 mm (without Dixie Road Development)



Link	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
width (mm)	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400
height (mm)	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400
length (m)	1724.5	2085.6	314.6	472.0	292.1	1041.3	797.0	749.4	1259.5	618.1	785.5	1050.6	1867.8	1396.9	271.1	532.4	886.9	1141.9	
inflow (l/s)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
grad (%)	0.181	0.179	0.250	0.250	0.250	0.250	0.250	0.250	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350	0.350
us inv (m AD)	177.126	180.858	181.645	182.825	183.555	186.158	188.151	190.024	194.432	196.596	199.345	203.022	209.559	214.449	215.397	217.261	220.365	224.362	
ds inv (m AD)	174.000	177.126	180.858	181.645	182.825	183.555	186.158	188.151	190.024	194.432	196.596	199.345	203.022	209.559	214.449	215.397	217.261	220.365	
surc	0.21	0.19	0.19	0.17	0.17	0.17	0.17	0.14	0.14	0.13	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	
DS flow (l/s)	805.47	750.93	715.28	699.49	697.86	691.37	498.94	497.33	498.44	74.27	73.94	73.87	73.78	73.67	73.63	73.62	73.60	73.57	
DS velocity (m/s)	1.186	1.242	1.232	1.376	1.394	1.382	1.008	1.233	1.234	0.205	0.529	0.528	0.528	0.528	0.527	0.527	0.527	0.527	
expr:q/Q	0.076411	0.071698	0.057762	0.056504	0.056383	0.055852	0.040298	0.040179	0.034030	0.005070	0.005048	0.005043	0.005037	0.005029	0.005029	0.005025	0.005025	0.005022	
Node	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
expr:Freeboard	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table C.8: Hydraulic Modelling Results for 2031 DWF (Low Flow) – 2400 mm (without Dixie Road Development)

Connection No.	Location	Proposed Diameter (mm)	Velocity	Flow Depth (d/D)	Flow Capacity (q/Q)
1	South of Glidden Road and Kennedy Road	2400	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
2	Queen Street and Kennedy Road	2400	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
3	Church Street and Kennedy Road	2400	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
4A	Vodden Road and Kennedy Road	2400	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
5A	Vodden Road Connection	2400	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
6	Etobicoke Creek West and Bovaird Drive East	2400	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
7	Fletchers Creek STS Diversion at Bovaird Drive East	2400	Between 0.75 m/s and 3.0 m/s	Below 85%	Below 70%
8	Future Street A	2400	Below 0.75 m/s	Below 85%	Below 70%
9	Old School Road and Hurontario Street (include Dougall SPS service area)	2400	Below 0.75 m/s	Below 85%	Below 70%

Flow
Building our future, faster.

Central Brampton

Appendix D

References for Potential Project Interfaces

AECOM

Peel Region

Appendix D-1

TYLin

February 13, 2025 PROJECT NUMBER 100256

Public Works, Water and Wastewater – Infrastructure Planning
Region of Peel
10 Peel Centre Drive
Brampton, ON L6T 4B9

Dear Italia Ponce, P.Eng.:

Re: Comments on the Municipal Class Environmental Assessment (MECA) Kennedy Road Sanitary Trunk Sewer Project
Hurontario Employment Secondary Plan Landowner Group
Part of Lots 23 to 27, Con.1 (WHS) and Con. 1 and 2 (EHS)
Town of Caledon, Region of Peel

T.Y.Lin International Canada Inc. (TYLin) has been retained by the Hurontario Employment Secondary Plan Area Landowner Group to review and provide comments for the Kennedy Road Sanitary Trunk Sewer Project MCEA.

The Hurontario Employment area is bound by King Street to the north, the Greenbelt Plan Area to the east, the proposed Highway 413 corridor to the south, and McLaughlin Road to the west in the Town of Caledon. The location of these lands is illustrated in **Attachment 1**. The Hurontario Employment Planning Area spans approximately 690 hectares (1,700 acres). This area is designated as part of the Region's New Urban Area, which is expected to accommodate significant growth and employment opportunities in the coming years.

The Landowner Group met with the Town of Caledon staff in December 2024 to discuss advancing the Secondary Plan process for the area. Currently, the Landowner Group is conducting various background studies and preparing to submit a formal planning application to the Town of Caledon.

TYLin attended the Public Information Centre (PIC) on January 28th for the Kennedy Road Sanitary Trunk Sewer Project, which introduced the proposed work and outlined the anticipated Municipal Class Environmental Assessment (MCEA) process. We understand that the current study area is bound by Old School Road to the north, Steeles Avenue to the south, Highway 410 to the east, and Chinguacousy Road to the west. However, this study area does not include the Hurontario Employment Secondary Plan area. To ensure that wastewater infrastructure needs for the Hurontario

Employment Secondary Plan area are considered in the planning of the Kennedy Road Sanitary Trunk Sewer, we request that the study area be expanded northward to King Street in the Town of Caledon.

At the PIC, two short-listed routes for the northern segment of the Kennedy Road Sanitary Trunk Sewer were presented, both extending north to Old School Road. The Secondary Plan area, located north of the proposed Highway 413 corridor, will require future wastewater infrastructure that must cross the highway corridor, necessitating an Environmental Assessment (EA). To prevent duplication of EA efforts, we request that the Kennedy Road Sanitary Trunk Sewer be extended beyond Highway 413.

We understand that Highway 413 is in its detailed design phase and may begin construction before the sanitary trunk sewer. Expanding the study area north of the Highway 413 corridor will allow early engagement with the Ministry of Transportation (MTO) regarding the Kennedy Road Sanitary Trunk Sewer crossing. This early coordination could enable MTO to account for the Kennedy Road Sanitary Trunk Sewer in their highway design and potentially include a pre-installed liner, reducing future construction impacts.

Our preliminary analysis indicates that for the Kennedy Road Sanitary Trunk Sewer to effectively service the Secondary Plan area, it should have a maximum obvert elevation of 253.00m at Hurontario Street and Old School Road. Additionally, at the crossing under a branch of Etobicoke Creek just south of 12615 McLaughlin Road, the maximum obvert elevation should be 238.00m. These obvert elevations are illustrated in **Attachment 2**.

We appreciate your consideration of this request and look forward to further discussions on integrating the wastewater servicing needs of the Hurontario Employment Secondary Plan area into the MECA Study.

Sincerely,

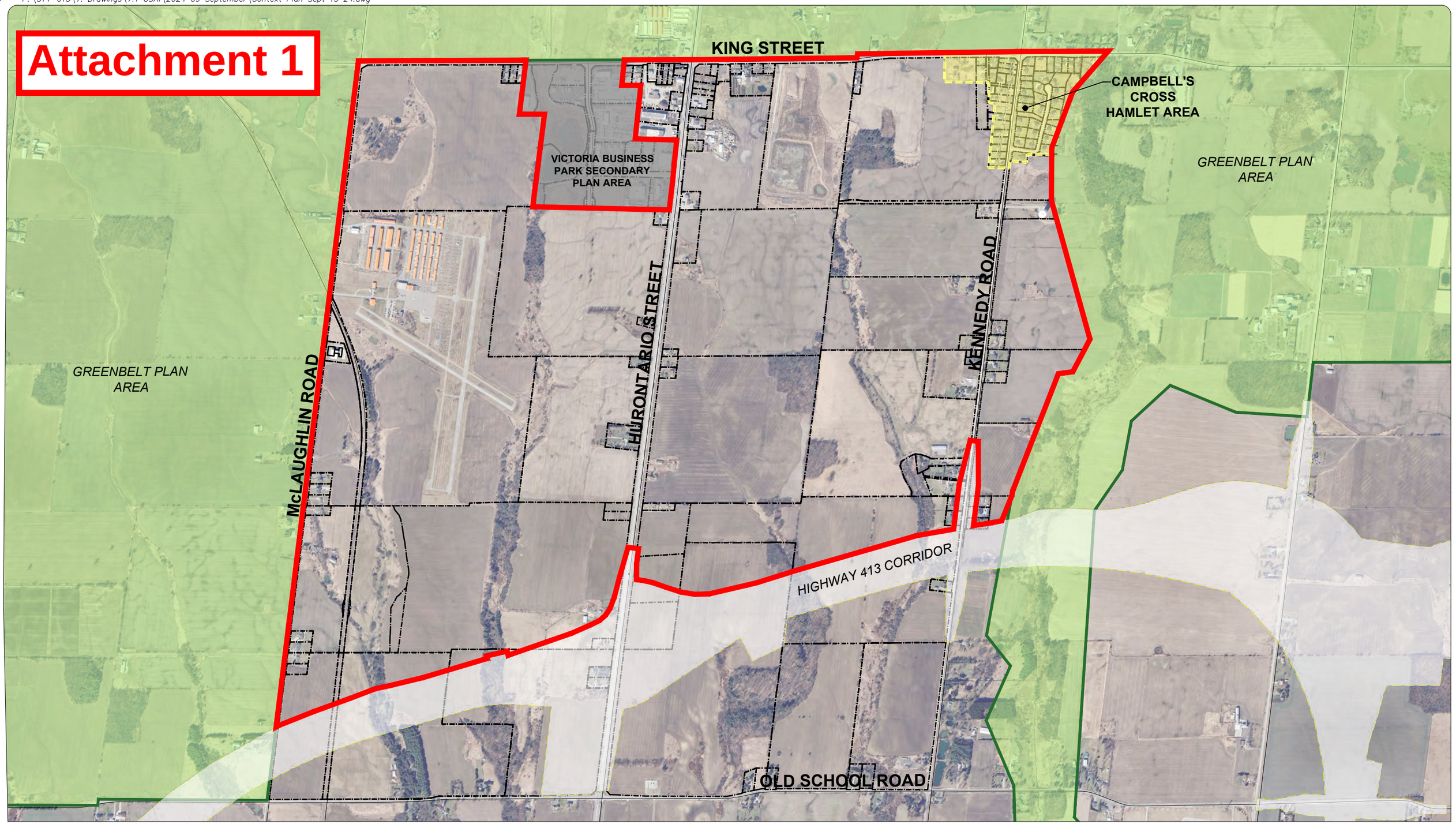
T.Y. Lin International Canada Inc.

Abdul Ahmadzai, P.Eng.
Director of Land Development
Abdul.ahmadzai@tylin.com

cc: David Moores (Orlando Corporation)
Lino Malito (Orlando Corporation)
Jason Afonso (GSAI)
Herman Wessels (GSAI)

P:\314-013\7. Drawings\7.1 GSAI\2024 09 September\Context Plan Sept 13 24.dwg

Attachment 1



PROPOSED HURONTARIO EMPLOYMENT SECONDARY PLAN AREA

TOWN OF CALEDON

LEGEND

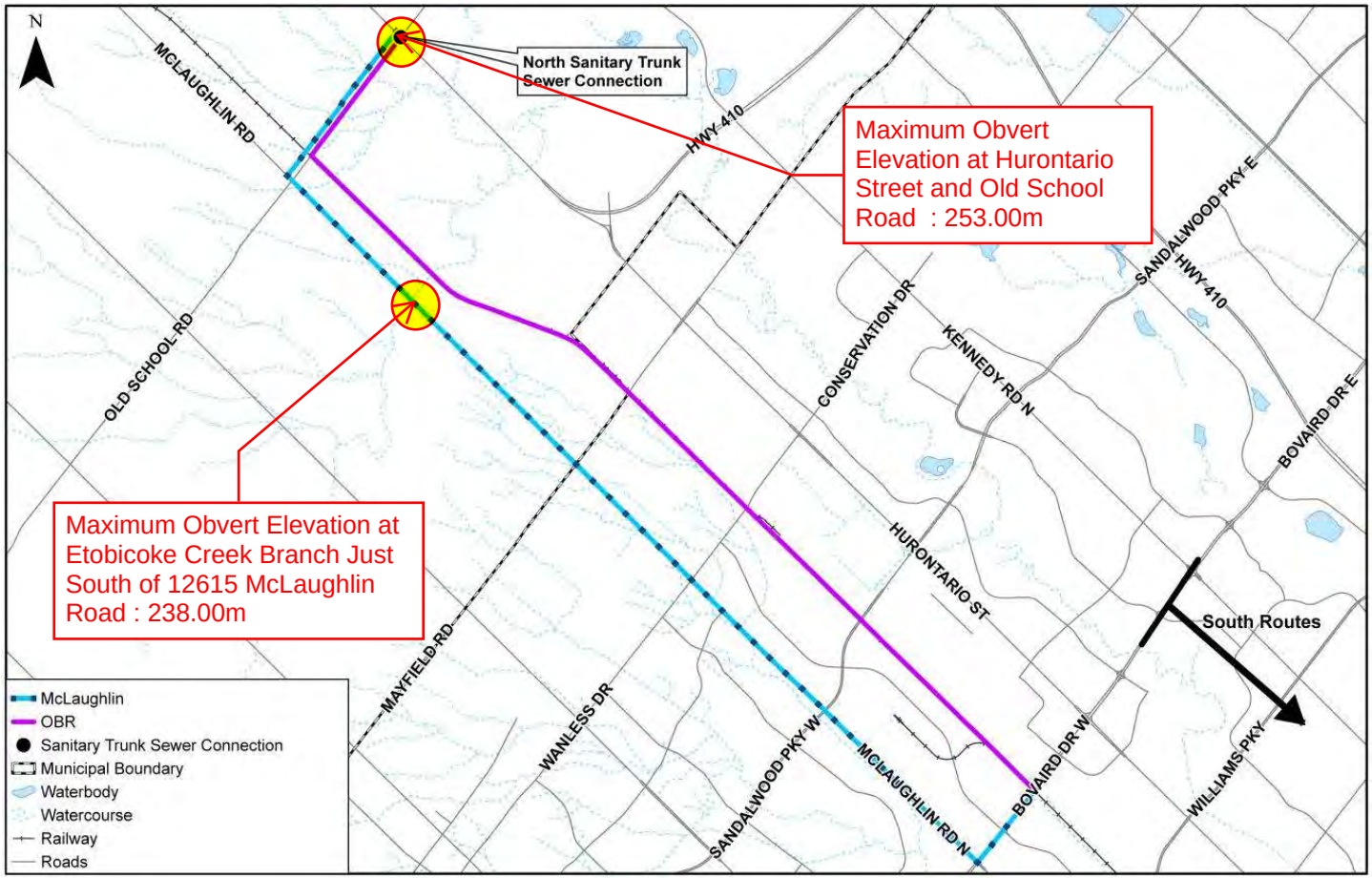
- PROPOSED SECONDARY PLAN AREA BOUNDARY
- GREENBELT PLAN AREA BOUNDARY
- HIGHWAY 413 CORRIDOR

N.T.S
SEPTEMBER 13, 2024

GSAI
Glen Schnarr & Associates Inc.

Attachment 2

North Short-listed Routes



Route N1: Orangeville Brampton Railway (OBR) Corridor including Old School Road Route has an approximate length of 9 km

Route N2: McLaughlin Road including Old School Road Route has an approximate length of 9 km

References:

I. Ponce and F. Amirsalari, "Kennedy Road Sanitary Trunk Sewer Project Public Information Centre #1," Peel Region, Dec. 2024. https://peelregion.ca/sites/default/files/2024-11/Kennedy-Road-EA-PIC-1-2024dec4.pdf

Appendix D-2

Leung, Sophy

From: Wan, Benny
Sent: Monday, June 2, 2025 8:11 AM
To: Leung, Sophy
Cc: Swan, Mark; Cooke, Lizete
Subject: FW: Servicing option alng Old School Road

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Sophy,

Please review the emails below and call me to discuss the response / additional analysis maybe required to address these ideas.

Regards,

Benny Wan, P.Eng., M.Sc.

AECOM
105 Commerce Valley Dr. W.
7th Floor
Markham, Ontario, L3T 7W3 Canada
T: (905) 747-7678
M: (416) 571-5219
F: (905) 886-9494
www.aecom.com

From: Ponce-Vanelli, Italia <italia.ponce@peelregion.ca>
Sent: May 29, 2025 6:36 PM
To: Swan, Mark <mark.swan@aecom.com>; Wan, Benny <Benny.Wan@aecom.com>
Cc: Beams, Greg <greg.beams@peelregion.ca>; Motamedi, Kolsoom <kolsoom.motamedi@peelregion.ca>; Zhu, Hong <hong.zhu@peelregion.ca>
Subject: Fw: Servicing option alng Old School Road

This Message Is From an External Sender

This message came from outside your organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Report Suspicious

Hi Mark and Benny

I received the email below from Kolsoom regarding a development on Dixie Rd south of Old School Road. Ultimately, she wants to look at the opportunity to service the development in question by connecting to our trunk sewer on Old school. However, they want to make sure that the capacity and the depth of the sewer is enough to accommodate the development.

Hong ran the model but I believe the one she has, had the sewer on Old school to be a 900mm. Is that still the case? She mentioned that the 900mm may need to be upsized and that a 1200mm would be more ideal for that area. Also there was a question about the depth; in order to connect this development and drain flows via gravity, they need to cross a creek west of Dixie which would require our sewer to be deeper.

Are you able to provide Kolsoom with the depth of the sewer at Old School and Hurontario as well as the size? What slope is the sewer on Old School? From the discussions in our previous meetings, I recall Benny looking at options and a slope of 0.25- 0.3%, is that still the case? Also if the sewer is too high, is there room to make it deeper?

Anything that you can provide me to help Kolsoom with the servicing option for this area, is greatly appreciated.

Thanks,

Italia Ponce, P. Eng.
Advisor
Infrastructure Planning
Water and wastewater division
Public Works - Region of Peel
905-791-7800 ext. 4583
Italia.ponce@peelregion.ca

From: Motamedi, Kolsoom <kolsoom.motamedi@peelregion.ca>
Sent: Tuesday, May 27, 2025 2:46:32 PM
To: Ponce-Vanelli, Italia <italia.ponce@peelregion.ca>
Cc: Zhu, Hong <hong.zhu@peelregion.ca>; Lee, Justin <Justin.Lee@peelregion.ca>
Subject: Servicing option alng Old School Road

Hi Italia,

I am currently reviewing the proposed industrial developments located at 12861 and 1289 Dixie Road, south of Old School Road. The modeling analysis indicates that the downstream Dixie Road trunk sewer does not have sufficient capacity to accommodate the additional flow from these developments.

To allow these developments to move forward, I am exploring a wastewater servicing option that involves diverting approximately 112.83 L/s (see below sketch) sanitary flow from the north side of Dixie Road toward the west to the future proposed Kennedy Trunk sewer. This would require extending the proposed sewer along Old School Road, from Heart Lake Road to Dixie Road.

I would like to confirm whether the proposed sewer along Old School Road is adequately sized and deep enough, particularly in the section crossing the creek west of Dixie Road, to service this area.

Thanks and Regards,

Kolsoom Motamedi, P.Eng., PMP

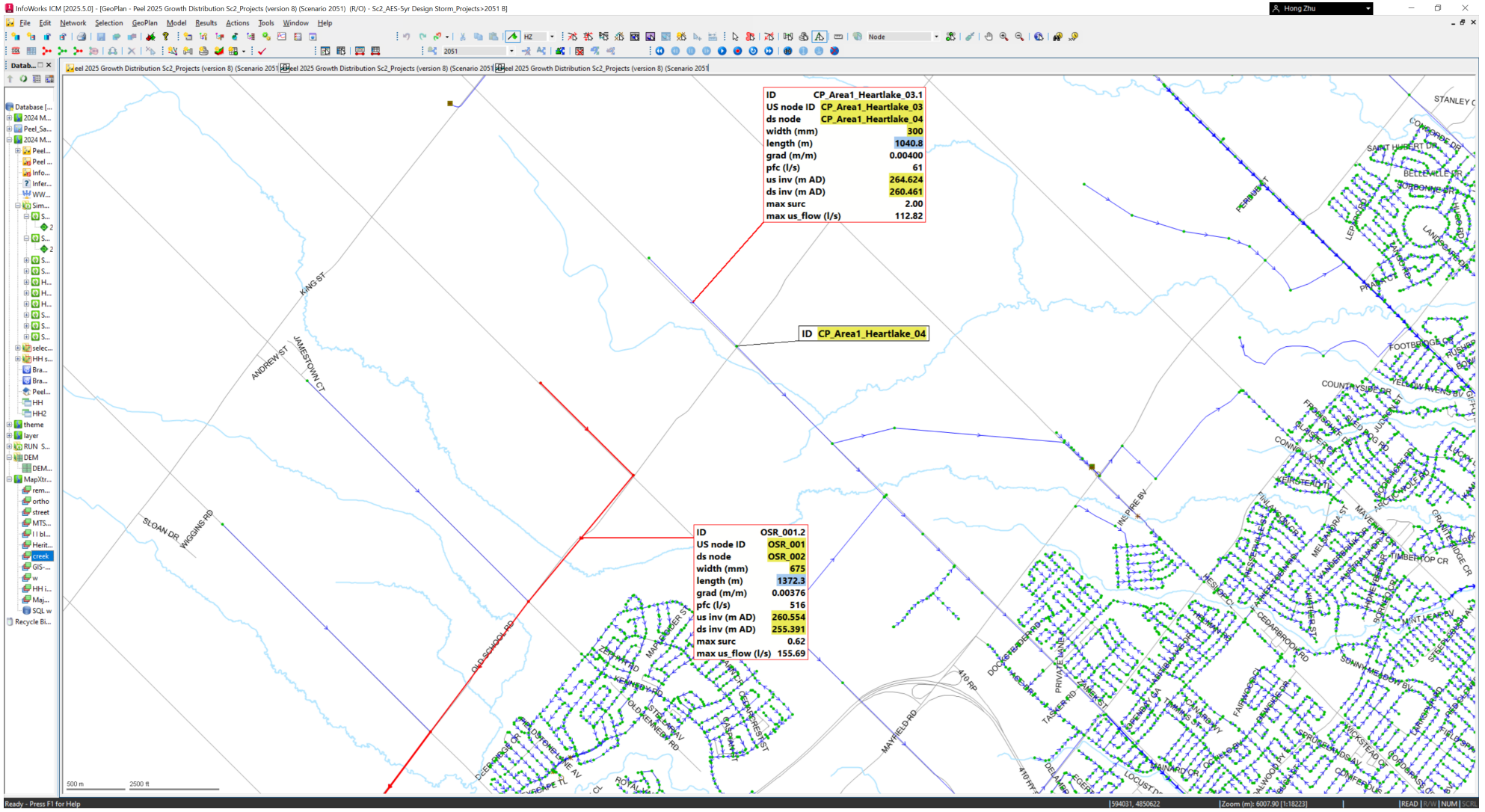
Advisor- Infrastructure Capacity Planning

Water & Wastewater Infrastructure Planning Division

Public Works

Kolsoom.Motamedi@peelregion.ca

C:647-962-8689
Tel. (905) 791-7800, ext. 4196


InfoWorks ICM [2025.5.0] - [GeoPlan - Peel 2025 Growth Distribution Sc2_Projects (version 8) (Scenario 2051) (R/O) - Sc2_AES-5yr Design Storm_Projects>2051 B]
Hong Zhu
File Edit Network Selection GeoPlan Model Results Actions Tools Window Help
ID CP_Area1_Heartlake_03.1
US node ID CP_Area1_Heartlake_03
ds node CP_Area1_Heartlake_04
width (mm) 300
length (m) 1040.8
grad (m/m) 0.00400
pfc (l/s) 61
us inv (m AD) 264.624
ds inv (m AD) 260.461
max surc 2.00
max us_flow (l/s) 112.82
ID CP_Area1_Heartlake_04
ID OSR_001.2
US node ID OSR_001
ds node OSR_002
width (mm) 675
length (m) 1372.3
grad (m/m) 0.00376
pfc (l/s) 516
us inv (m AD) 260.554
ds inv (m AD) 255.391
max surc 0.62
max us_flow (l/s) 155.69
KING ST
ANDREW ST
JAMESTOWN CT
SLOAN DR
WIGGINS RD
OLD SCHOOL RD
MAYFIELD RD
410 RP
PERRIER ST
STANLEY C
CONCORDE DR
SAINT HUBERT DR
BELLEVILLE DR
JORDONNE DR
LANDSCAPE DR
PRAIRIE CT
FOOTBRIDGE CR
COUNTRYSIDE DR
YELLOW RIVER BV
CONNAUGHT DR
KENSTEAD CT
INNISFIRE BV
TIMBERTOP CR
MINT LEAF CV
SUNNY MEADOW BV
DOCKSTEADER RD
TASKER RD
ZAMBEZI ST
PRIVATE LANE
CEDARBROOK RD
FAIRWOOD CR
WICKSTEAD CR
CONIFER DR
MAINARD CR
LOCUST DR
DEERPARK CIR
DEERPARK TL
ROYAL
500 m
2500 ft
Ready - Press F1 for Help
594031, 4850622
Zoom (m): 6007.90 [1:18223]
READ R/W NUM SCRL

Appendix D-3

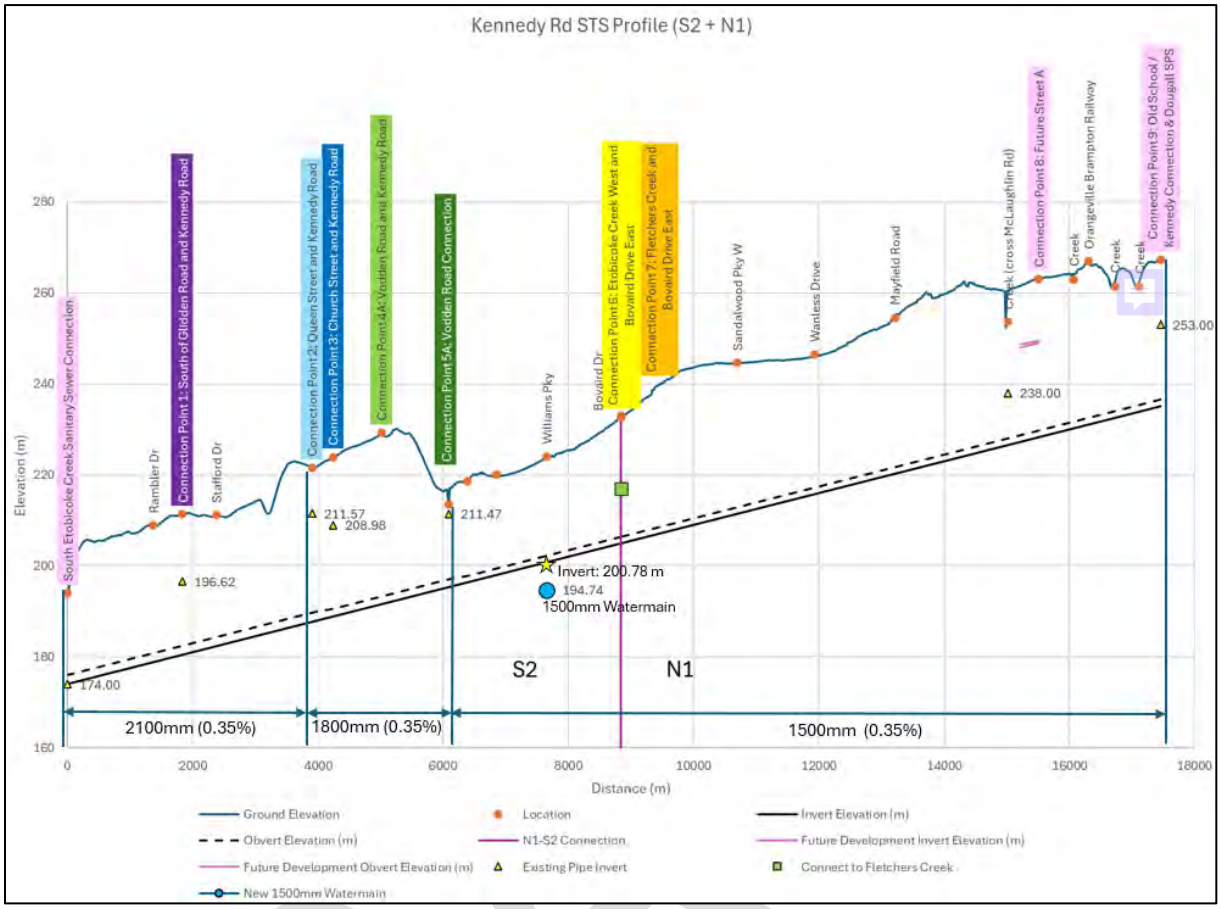


Figure 20 – Profile for Routing Option N1 + S2 (Option 2)

Based on the current hydraulic model which was updated with the Region's 2051 Scenario 2 population projection, the peak flows in the Kennedy STS through each connection points are summarized in **Table 4**. Please note that the Kennedy STS will divert the sanitary sewer flows from the existing Fletcher Creek STS and Etobicoke Creek STS at Bovaird Drive West and Vodden Street, respectively, and therefore, the peak flows in these two STS will be reduced. To support the Region's ongoing detailed design for Etobicoke Creek STS, the simulated peak flows in these STS are also included in the table below.

Table 4: Design Flows for Kennedy STS

Connection No.	Location	Inflow (L/s)	Accumulated Flow (L/s)	Proposed Size (mm)	
				Option 1	Option 2
0 (SND-6337990.1)	Existing 1050mm Etobicoke STS (1) Upstream of Kennedy STS connection Point	1,437	N/A	N/A	N/A
0 (SND-1781512.1)	Existing 1050mm Etobicoke STS (2) Upstream of Kennedy STS connection Point	538	N/A	N/A	N/A
1	South of Glidden Road and Kennedy Road	0	4,345	2,100	2,100

Leung, Sophy

From: Ponce-Vanelli, Italia <italia.ponce@peelregion.ca>
Sent: Thursday, October 23, 2025 4:02 PM
To: Leung, Sophy; Newton, Dorin
Cc: Wan, Benny; Ghassemi, Mike; Jetten, Marya; Vandermeer, Brandon; Beams, Greg; McLeod, Duncaun
Subject: RE: Kennedy STS Hydraulic Analysis Technical Memorandum (Draft)

Follow Up Flag: Follow up
Flag Status: Flagged

This Message Is From an External Sender

This message came from outside your organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Report Suspicious

Hi Sophy
Just to clarify, the culvert is along Old School, 120 m west of Hurontatio but I realized that the scope of work for that portion of the sewer falls under the Caledon Flow program. However something to keep in mind as part of the design.



Italia Ponce, P. Eng.
Advisor

Public Works
Water and Wastewater – Infrastructure Planning
Italia.ponce@peelregion.ca
905-791-7800 ext. 4583

Peel Region
working with you

Appendix D-4

TATHAM ENGINEERING

18 Macdonell Street, Unit 200
Guelph, Ontario N1H 2Z3

T 705-444-2565
E info@tathameng.com
tathameng.com

Memo

File	Recipient	Company
424487	**Frank Filippo**	**Brookvalley**
	Lyle LeDrew	**Region of Peel**
	Dan Bennington	**Region of Peel**
	Bill Turner	**Region of Peel**

Date	Purpose
December 3, 2024	**Mayfield West Stage 2 SPS, Caledon Sanitary Catchment Area and Design Flows**

Message

Introduction

This memo aims to confirm the sanitary catchment area and the resulting sewage design flows that are expected to contribute to the proposed sewage pumping station (SPS) intended to service the Mayfield West – Stage 2, Phase 1E, 2E, and 2W lands located on the east and west sides of McLaughlin Road south of Old School Road within the Town of Caledon, Region of Peel.

In addition, this memo aims to confirm the extent of the Region's linear infrastructure to be designed and constructed within McLaughlin Road as part of the works.

Sanitary Catchment Area

The contributing sanitary catchment area has been established based on previous discussions with the Region, review of the *Scoped Development Phasing and Staging Plan* prepared by Malone Givens Parsons Ltd. (June 2024) in support of the Official Plan Amendment application for the subject lands (appended), and through discussions with Brookvalley.

The catchment area excludes external development lands north of Old School Road, east of Hurontario Street and west of Phase 2W. The development areas and contributing catchments have been adjusted (reduced) as required in consideration of the future Highway 413 corridor.

Phase 1E and 2E (Catchment 202)

Based on the *Scoped Development Phasing and Staging Plan*, Phase 1E and 2E have a combined net area of 109.23 ha, were allocated a total of 2,648 residential units and an employment population of 571 persons (established based on 7% of total residential population). However, as the net area includes SWM Ponds, Parks, environmental lands etc. which are not typically considered in the calculation of sewage flows, these areas have been eliminated for the purpose of this assessment, resulting in a developable area for the purpose of sewage generation (i.e. I&I contribution) of 90.9 ha as shown as Catchment 202 on the Sanitary Drainage Plan (Drawing SAN.1), appended.

For the purpose of this assessment, we have assumed that sewage from the Mixed Use and Residential lands (as depicted in the *Scoped Development Phasing and Staging Plan*) located in the northeast corner of Phase 2E, as well as the western most Mixed Use block within Phase 1E fronting Hurontario Street will not be conveyed to the SPS

Professional Engineers Ontario · Association of Consulting Engineering Companies Ontario · PGO
Authorized by PEO and PGO to offer professional services in the fields of Engineering and Geoscience in Ontario.

Enhancing our communities

and will rather be conveyed via sewage infrastructure within Hurontario Street. These areas are noted on Drawing SAN.1.

The number of residential units and employment population has been established based on the information provided in the *Scoped Development Phasing and Staging Plan,* minus the non-contributing areas described above. This results in a total of 2,373 residential units within Catchment 202. As described in the below Design Parameter section, our assessment utilizes persons per unit (PPU) values as per the Region's standards (rather than the PPUs utilized in the *Scoped Development Phasing and Staging Plan)*. Therefore, the total residential population in Phase 1E and 2E assumed to contribute sewage flow to the SPS is 9,177 persons, while the employment population is 643 (utilizing 7% of total residential population).

Phase 2W (Catchment 201)

Based on review of available information and through consultation with Brookvalley, we have assumed a portion of the Phase 2W lands located on the west side of McLaughlin Road will contribute sewage flow to the SPS. For the purpose of this assessment, we have assumed 18.8 ha of Phase 2W will contribute to the SPS (excluding lands for the future Highway 413 corridor). Therefore, we have calculated the residential unit count for these lands by applying the net residential low density unit per ha (uph) of 20 for the Phase 2W lands as per the *Scoped Development Phasing and Staging Plan* to the reduced area, resulting in a total of 376 low density residential units. Applying the Region's PPU values, the resulting residential population is 1,580 persons while the employment population is 111 persons (7% of total residential population). The contributing Phase 2W lands are delineated as Catchment 201 on Drawing SAN.1, appended.

Summary

The total sanitary catchment area understood to contribute to the SPS consists of the following characteristics:

- an area of approximately 109.7 ha;
- a total of 2,749 residential units with a residential population of 10,757 persons; and
- a total employment population of 754.

Catchment 201 represents approximately 15% of the total contributing population, while Catchment 202 represents the remaining 85%.

Design Parameters

The estimated peak sanitary flow contributing to the SPS was calculated utilizing parameters and criteria as per the Region of Peel's Linear Wastewater Standards. Key parameters are summarized below:

DESIGN PARAMETER	VALUE
Average Daily Residential Flow (L/person/day)	290
Average Daily Employment Flow (L/person/day)	270
Low Density PPU (Singles, Semis)	4.2
Medium Density PPU (Townhouse)	3.4
Mixed Use PPU (Large Apartments – greater than 1 bedroom)	3.1
Peaking Factor	Harmon
Inflow and Infiltration (L/s/ha)	0.26

We note the PPUs utilized in this assessment are based on Region standards which are higher than the PPUs utilized in the *Scoped Development Phasing and Staging Plan.* Therefore, our assessment utilizes a more conservative residential population compared to the residential populations provided in the *Scoped Development Phasing and Staging Plan.*

For the purpose of estimating peak flows the Harmon peaking factor has also been applied to employment related flows which expect to result in conservative values.

Design Flow

Based on the above assumptions and as per the appended calculation sheets, we have estimated a peak flow contributing to the SPS of 139.7 L/s.

Therefore, for the purpose of designing the SPS, we propose to utilize a design flow of 140.0 L/s.

Extent of Linear Infrastructure

To confirm our understanding of the extent of linear infrastructure (sanitary gravity sewer, sanitary forcemain and watermain) to be designed in accordance with our contract, we have prepared the appended Concept Servicing Plan (Drawing CSP.1). As depicted on Drawing CSP.1, the limit of linear works to be designed as part of this contract is understood to consist of:

- approximately 450 m of twin sanitary forcemain in McLaughlin Road from the SPS to proposed gravity sewer;
- approximately 250 m of gravity sanitary sewer from limit of proposed forcemain to the existing gravity sewer located in McLaughlin Road (north of Lippa Drive);
- approximately 360 m of gravity sanitary sewer in McLaughlin Road from the SPS to east-west road of future development; and
- approximately 960 m of watermain in McLaughlin Road from the existing stub north of Lippa Drive to east-west road of the future development.

We request the Region review Drawing CSP.1 and confirm our understanding of the limits of linear infrastructure to be designed in accordance with this contract are correct.

Summary & Next Steps

Following approval of the proposed design flow of 140.0 L/s and confirmation of the extent of linear works, Tatham will proceed with the preliminary design of the SPS and equalization storage, dual forcemains, gravity sewers and watermains.

From

Nick Millington, P.Eng. & Stuart Mitchell, P.Eng.

Wastewater Generation Calculations

Project Details	
Mayfield West Phase 2, Stage 3 SPS	424487

Municipality
Town of Caledon, Region of Peel

Prepared By	
JLM	December 3, 2024

Checked By	
NM	December 3, 2024

Catchment 202: Phase 1E

	Low Density Res.	Med. Density Res.	Mixed-Use	Employment
Units	1,023	30	-	-
Persons Per Unit	4.20	3.40	-	-
Population/ Jobs	4,297	102	-	308
Average Flow (L/day/cap)	290	290	-	270
Area (ha)	43.8	0.6	-	3.5
Total Area (ha)	47.9			
Average Day Flow (m^3/day)	1,246.1	29.6	-	83.2
Total Average Day Flow (m^3/day)	**1,358.9**			

Catchment 202: Phase 2E

	Low Density Res.	Med. Density Res.	Mixed-Use	Employment
Units	566	210	544	-
Persons Per Unit	4.20	3.40	3.10	-
Population/ Jobs	2,379	714	1,685	335
Average Flow (L/day/cap)	290	290	290	270
Area (ha)	25.9	2.7	10.9	3.5
Total Area (ha)	43.0			
Average Day Flow (m^3/day)	689.9	207.1	488.7	90.5
Total Average Day Flow (m^3/day)	**1,476.1**			

Catchment 202 Total

	Low Density Res.	Med. Density Res.	Mixed-Use	Employment
Units/Jobs	1,589	240	544	643
	Residential			**Employment**
Total Population	9,177			643

Catchment 201: Phase 2W Residential

	Low Density Res.	Med. Density Res.	Mixed-Use	Employment
Units	376	-	-	-
Population Density (cap/unit)	4.20	-	-	-
Population/ Jobs	1,580	-	-	111
Average Flow (L/day/cap)	290	-	-	270
Area (ha)	18.8	-	-	-
Total Area (ha)	18.8			
Average Day Flow (m^3/day)	458.2	-	-	30.0
Total Average Day Flow (m^3/day)	**488.2**			

Totals (201 + 202)

	Low Density Res.	Med. Density Res.	Mixed-Use	Employment
Units/Jobs	1,965	240	544	754
	Residential			**Employment**
Population	10,757			754

Peaking Factors

Land Use	Residential (Harmon)
Peaking Factor	2.89

Infiltration Flow

Serviced Area (ha)	Infiltration Flow (L/s/ha)	Infiltration Flow (L/s)
109.67	0.26	28.51

Total Design Flows

Average Day Flow (m^3/day)	**3,323.1**
Peak Flow (L/s)	**139.7**

Notes

1. Approximate future Highway 413 Corridor as provided in Land Use Plan prepared by Malone Given Parsons Ltd. (dated October 25, 2024) as shown in red on Drawing SAN.1.

2. Land uses from *Official Plan Amendment Scoped Development Phasing and Staging Plan: Mayfield West Phase 2 - Stage 3 Lands, Caledon, ON* prepared by Malone Given Parsons Ltd. (June 2024) (herein referred to as the *"MGP OPA Development Plan"*) located within Future Highway 413 Corridor have been excluded in Catchments 201 and 202 unit counts.

3. PPUs and average flow design criteria as per Peel Region's *Linear Wastewater Standards* (March 2023). Assigned Mixed-Use PPU of 3.1 based on "Large Apartment (greater than 1 bedroom)" PPU from Peel Region standards.

4. Employment/Jobs estimated at 7% of total population in accordance with *MGP OPA Development Plan.*

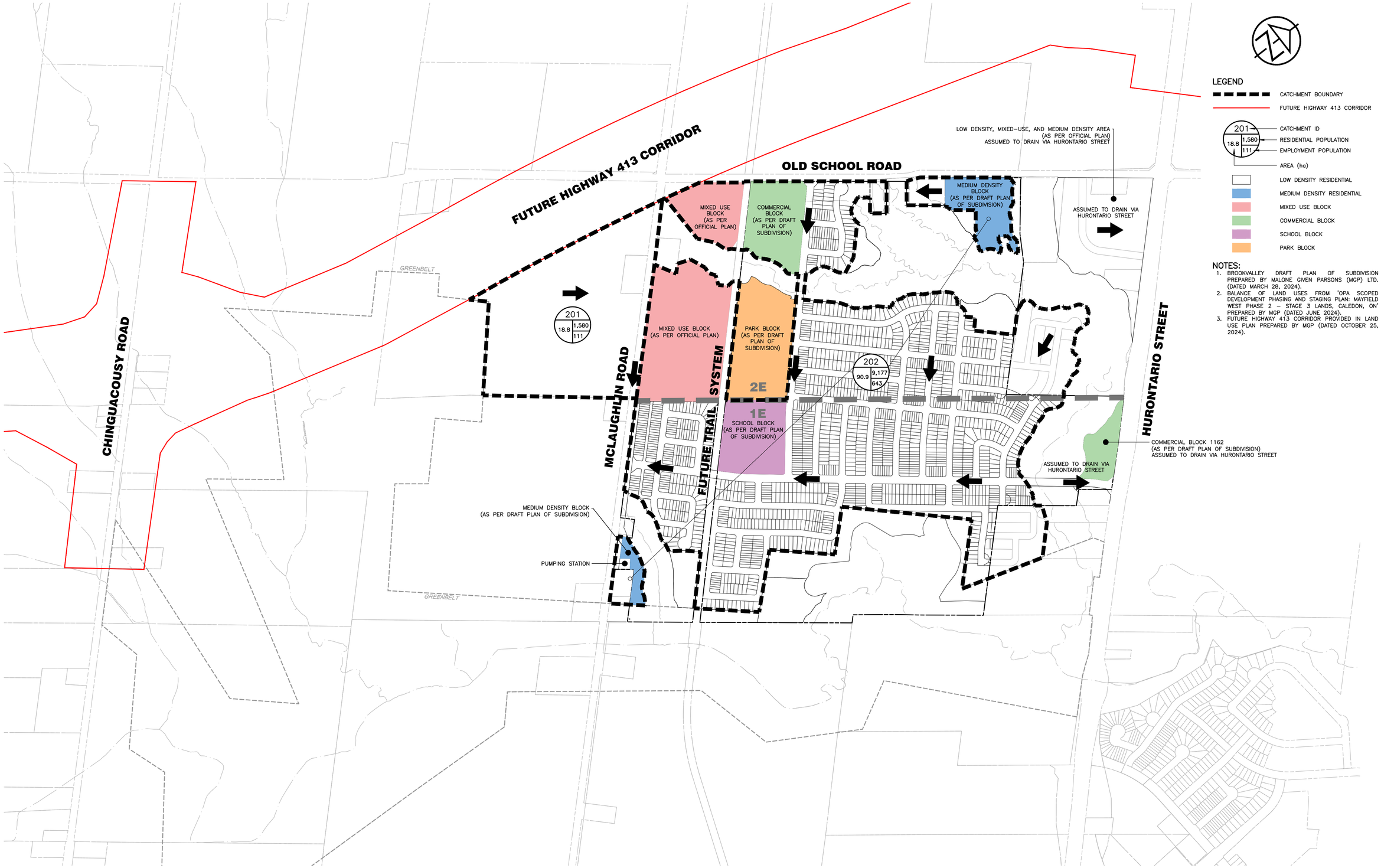
5. Harmon Peaking Factor applied to employment related average day flow values to determine overall peak flow.

6. Catchment 201 unit count calculated by applying Net Residential Density of 20.00 uph as per *MGP OPA Development Plan* to contributing Low Density Residential area as per *MGP OPA Development Plan* to account for reduced contributing area.

7. Catchment 202 (Phases 1E and 2E) exclude lands east of Environmental Policy Area assumed to drain to Hurontario Street as shown on Drawing SAN.1.

8. Catchment 202 areas adjusted as per proposed Brookvalley Draft Plan of Subdivision prepared by Malone Given Parsons Ltd. (dated March 28, 2024). Catchment 202 Net Residential Densities from *MGP OPA Development Plan*.

- Phase 1E Low Density Residential unit count as per *MGP OPA Development Plan*;
- Phase 1E Medium Density Residential unit count calculated by applying Net Residential Density of 48.22 uph as per *MGP OPA Development Plan* to contributing Medium Density Residential area as per the Draft Plan;
- Phase 2E Low Density Residential unit count calculated as:
Unit count = *MGP OPA Development Plan* units - (Low Density Residential land area assumed to drain to Hurontario Street (4.55 ha) x 22.15 uph);
- Phase 2E Medium Density Residential unit count calculated as:
Unit count = *MGP OPA Development Plan* units - (Medium Density Residential land area assumed to drain to Hurontario Street (1.00 ha) x 48.22 uph); and
- Phase 2E Mixed-Use unit count as per Net Residential Density of 50.00 uph as per *MGP OPA Development Plan* applied to Mixed-Use area of 10.87 ha.



DISCLAIMER AND COPYRIGHT

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

TATHAM ENGINEERING LIMITED CLAIMS COPYRIGHT TO THIS DRAWING WHICH MAY NOT BE USED FOR ANY PURPOSE OTHER THAN THAT PROVIDED IN THE CONTRACT BETWEEN THE OWNER/CLIENT AND THE ENGINEER WITHOUT THE EXPRESS CONSENT OF TATHAM ENGINEERING LIMITED.

BENCHMARKS

NOTES

No.	REVISION DESCRIPTION	DATE
1.	SANITARY DESIGN FLOWS MEMO	DEC. 3/24

ENGINEER STAMP

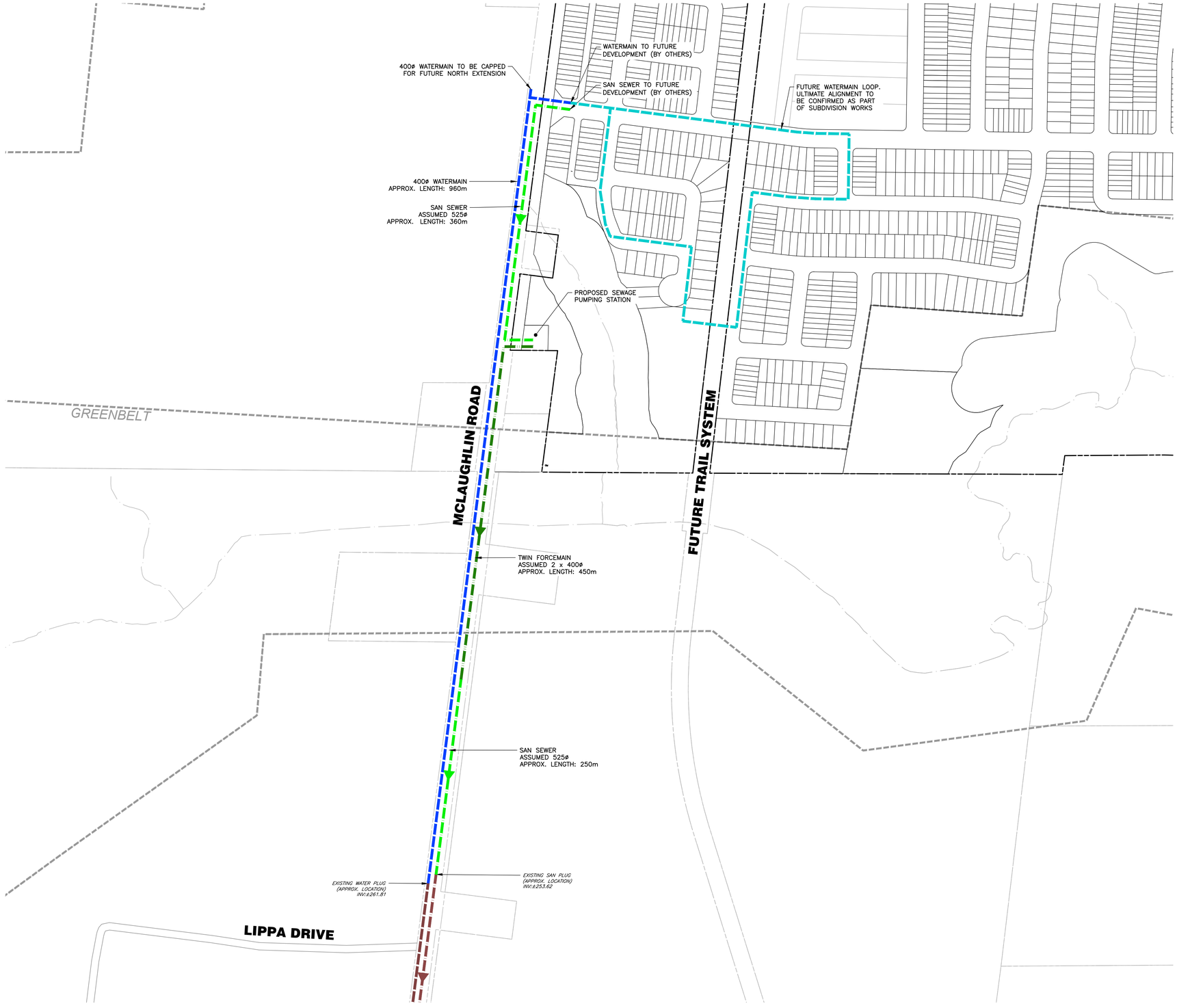
MAYFIELD WEST PHASE 2
TOWN OF CALEDON

TATHAM ENGINEERING

SANITARY CATCHMENT PLAN

DESIGN: LG/NM	FILE: 424487	DWG: SAN.1
DRAWN: LG	DATE: NOV 2024	
CHECK: NM	SCALE: 1:5000	

Drawing Name: 424487-SAN01.dwg, Plotted: Dec 03, 2024



LEGEND

- EXISTING WATERMAIN (APPROX. LOCATION)
- EXISTING SANITARY SEWER (APPROX. LOCATION)
- PROPOSED WATERMAIN
- FUTURE WATERMAIN
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY FORCEMAIN

NOTES:

1. BROOKVALLEY DRAFT PLAN OF SUBDIVISION PREPARED BY MALONE GIVEN PARSONS (MGP) LTD. (DATED MARCH 28, 2024).
2. BALANCE OF LAND USES FROM "OPA SCOPED DEVELOPMENT PHASING AND STAGING PLAN: MAYFIELD WEST PHASE 2 – STAGE 3 LANDS, CALEDON, ON" PREPARED BY MGP (DATED JUNE 2024).

DISCLAIMER AND COPYRIGHT

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

TATHAM ENGINEERING LIMITED CLAIMS COPYRIGHT TO THIS DRAWING WHICH MAY NOT BE USED FOR ANY PURPOSE OTHER THAN THAT PROVIDED IN THE CONTRACT BETWEEN THE OWNER/CLIENT AND THE ENGINEER WITHOUT THE EXPRESS CONSENT OF TATHAM ENGINEERING LIMITED.

BENCHMARKS

NOTES

No.	REVISION DESCRIPTION	DATE
1.	SANITARY DESIGN FLOWS MEMO	DEC. 3/24

ENGINEER STAMP

MAYFIELD WEST PHASE 2
TOWN OF CALEDON

TATHAM ENGINEERING

CONCEPT SERVICING PLAN

DESIGN: LG/NM	FILE: 424487	DWG: CSP.1
DRAWN: LG	DATE: NOV 2024	
CHECK: NM	SCALE: 1:3000	

Drawing Name: 424487-CSP01.dwg, Plotted: Dec 03, 2024

Official Plan Amendment

Scoped Development Phasing and Staging Plan

Mayfield West Phase 2 – Stage 3 Lands
Caledon, ON

Prepared by:

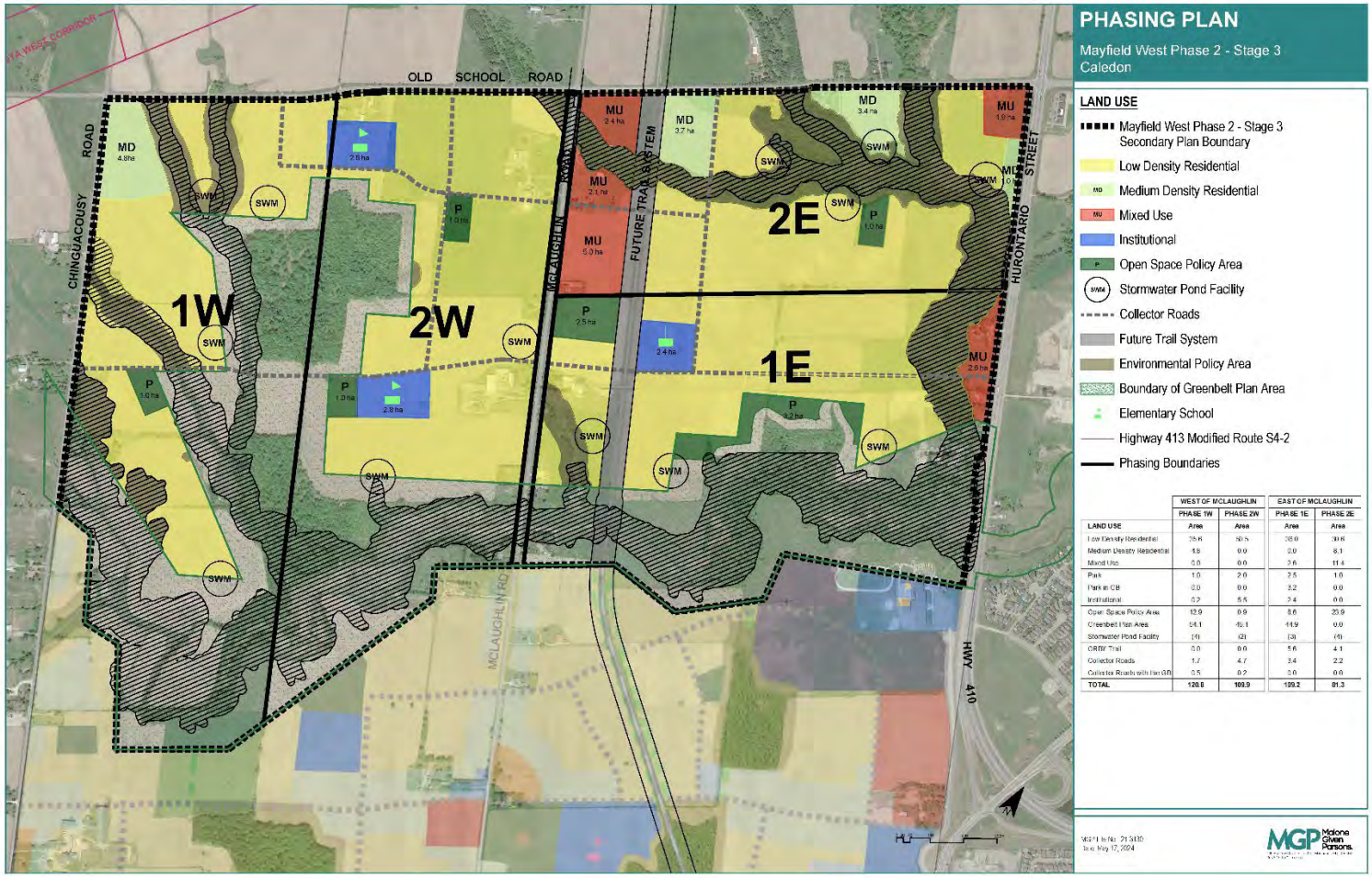
Malone Given Parsons Ltd
140 Renfrew Drive
Suite 201
Markham ON L3R 6B3

June 2024

MGP File: 21-3130

Page intentionally left blank

Development Phasing and Staging Plan



LAND USE	WEST OF MCLAUGHLIN PHASE 1W Area	WEST OF MCLAUGHLIN PHASE 2W Area	EAST OF MCLAUGHLIN PHASE 1E Area	EAST OF MCLAUGHLIN PHASE 2E Area
Low Density Residential	25.8	50.5	28.0	30.6
Medium Density Residential	1.8	0.0	3.0	8.1
Mixed Use	0.0	0.0	3.6	11.4
Park	1.0	2.0	2.5	1.0
Park in OS	0.0	0.0	3.2	0.0
Institutional	0.2	5.5	2.4	0.0
Open Space Policy Area	13.9	0.9	8.6	23.9
Greenbelt Plan Area	54.1	40.1	44.9	0.0
Stormwater Pond Facility	(9)	(2)	(3)	(9)
ORM Trail	0.0	0.0	5.6	4.1
Collector Roads	1.7	4.7	3.4	2.2
Collector Roads with Hwy 413	0.5	0.2	2.0	0.0
TOTAL	120.8	109.9	109.2	91.3

Mayfield West 2-3 Residential Mix and Population by Phase

Development Phase	Land Use Designation	Unit Type	Net Area[1] (ha)	Net Residential Area[2] (ha)	# of Units	Net Residential Density (uph)	Persons Per Unit[3]	Population Estimate	Job Estimate[4]
Stage 3 - 1E	Low Density Residential	Single-detached, Semi-detached, Street Townhouses, Laneway Townhouses		35.34	1,023	29.0	3.67	3,756	263
	Mixed Use	Townhouses, Laneway Townhouses, Stacked Townhouses, Back-to-Back Townhouses, and Mid-Rise Apartment		2.60	130	50.0	1.76	229	16
	Stage 3 - 1E Sub-Total		**51.88**	**37.94**	**1,153**	**30.4**		**3,985**	**279**
Stage 3 - 2E	Low Density Residential	Single-detached, Semi-detached, Street Townhouses, Laneway Townhouses		30.59	667	21.8	3.67	2,448	171
	Medium Density Residential	Townhouses, Laneway Townhouses, Stacked Townhouses, and Back-to-Back Townhouses		8.10	258	31.9	2.79	720	50
	Mixed Use	Townhouses, Laneway Townhouses, Stacked Townhouses, Back-to-Back Townhouses, and Mid-Rise Apartment		11.40	570	50.0	1.76	1,003	70
	Stage 3 - 2E Sub-Total		**57.35**	**50.09**	**1,495**	**29.8**		**4,171**	**292**
Stage 3 - 1W	Low Density Residential	Single-detached, Semi-detached, Street Townhouses, Laneway Townhouses		35.56	665	18.7	3.67	2,441	171
	Medium Density Residential	Townhouses, Laneway Townhouses, Stacked Townhouses, and Back-to-Back Townhouses		4.80	364	75.8	2.79	1,016	71
	Stage 3 - 1W Sub-Total		**43.3**	**40.36**	**1,029**	**25.5**		**3,456**	**242**
Stage 3 - 2W	Low Density Residential	Single-detached, Semi-detached, Street Townhouses, Laneway Townhouses	**62.7**	**50.48**	**1,010**	**20.0**	**3.67**	**3,707**	**259**
MW2-3 Area Total			**215.23**	**178.86**	**4,687**	**26.2**		**15,318**	**1,072**
MW2-3 Area Density						**76.2**	**people and jobs per hectare**		

Notes:

1 - Net area excludes Environmental Policy Area and Greenbelt Plan Area

2 - Net residential area excludes Environmental Policy Area, Greenbelt Plan Area, Parks, Schools, OBRY Trail and Collector Roads

3 - Persons per unit based on 2019 Town of Caledon Development Charges Background Study

4 - Population-Related Employment is assumed at 7% of the population

Unit Mix and Density by Designation

Land Use Designation	# of Units	Net Residential Area[1] (ha)	Net Residential Density (uph)	Population Estimate[2]
Low-Density Residential	3,365	151.96	22.15	12,351
Medium-Density Residential	622	12.90	48.22	1,735
Mixed Use Residential	700	14.00	50.00	1,232
Total	**4,687**	**178.86**	**26.21**	**15,318**

Notes:

1 - Net residential area excludes Environmental Policy Area, Greenbelt Plan Area, Parks, Schools, OBRY Trail and Collector Roads

2 - Population estimate calculated using persons per unit based on 2019 Town of Caledon Development Charges Background Study

Estimated Unit Mix by Unit Type

Unit Type	# of Units
Singles	1,699
Townhouses	1,249
Medium Density	1,038
Mixed Use	700
Total	**4,687**

Estimated Averaged Unit Build Out

Year	Single-Detached	Towns	Medium Density and Mixed Use (B2B Towns)	Total Units
Brookvalley Mayfield 2-3 Project Buildout				
2026	154	114	158	**426**
2027	154	114	158	**426**
2028	154	114	158	**426**
2029	154	114	158	**426**
2030	154	114	158	**426**
2031	154	114	158	**426**
2032	154	114	158	**426**
2033	154	114	158	**426**
2034	154	114	158	**426**
2035	154	114	158	**426**
2036	154	114	158	**426**
Total	**1,699**	**1,249**	**1,738**	**4,687**