Technical Memorandum

Project Name: 1120 Cooke Blvd

MTE File No.: 48247-100

To: Joshua Medeiros, City of Burlington

Date: July 21, 2023

cc:

From: George Berenyi, MTE Consultants

RE: Sanitary Drainage Update on Plains Road East

MTE Consultants Inc. were retained by ADI Developments (Masonry) Inc. to complete the site grading, servicing, and stormwater management design for the proposed mixed-used development located at 1120 Cooke Boulevard in the City of Burlington (see Key Plan in Dwg SA1). The overall site comprises 0.97ha. As part of the OPA/ZBA re-submission, the existing downstream sanitary sewer connectivity has been reviewed and revised and we have updated our plans accordingly. Included in the tributary area are other development proposals as noted on the drawings and those future sites as projected by a parcel inventory and estimate of dwelling units and bedrooms done by WND Associates. This technical memorandum addresses these updates to the downstream sanitary sewers.

Connectivity update

Referring to Dwg SA-EX, updated information indicates the sanitary sewer on Clearview Ave at the intersection with Plains Road E, has a split MH (Ex. MH 13339). Per the Region Dwg B-05065 and the Odan-Detech report for that area, the flows from Clearview Ave flow to the east and not to the west and do not enter this sewer-shed. Therefore, the sanitary sewer analysis has been updated. In doing so, we have included other projects found on the City's website and those projected by a parcel inventory as stated above. These projections/estimates of population were only used in the design sheets for sites without known development applications. Wherever known, the populations for sites with development proposals were used in the design sheets instead of future estimates.

Stages of the Sanitary Analysis

Referring to the attachments, we provide a brief description of the updated calculations below, where the design sheet names below are for **"Station West - Phase2…"**;

- First design sheet **"…Existing conditions"** goes with Dwg SA-EX. This is the existing condition at the start of this project, with zero population and all downstream sites as shown. No pipes are above 70% full.

- Second design sheet **"…Previously Approved during Phase 1"** goes with Dwg AC-SAN1(ROW). This is the same as the later, but with the previously approved population for Phase 2. The slight increase pushes two of the last pipes on Plains Road E to almost 70% full.

- Third design sheet **"…Existing conditions with Other Approved Developments"** goes with Dwg SA1. This now includes all the sites as described in the introduction but has the same Phase 2 population as the later. It shows the downstream impacts with Phase 2 at its approved population. Three legs of 300mm diameter sewer on Cooke Blvd will be surcharged up to 102% and three legs of 250mm diameter sewer on Plains Roads E will be surcharged up to 176%.

- Fourth design sheet **"…Proposed Phase 2 Demands- No pipe upgrades"** also goes with Dwg SA1. It is the same condition as the later but now the Phase 2 populations are accounted for, based

on the calculated demands for Buildings A, B and C. This increases the surcharging on the same six legs above, so now three legs of 300mm diameter sewer on Cooke Blvd will be surcharged up to 158% and three legs of 250mm diameter sewer on Plains Road E will be surcharged up to 255%.

We note that in this ultimate condition, the first leg of 300mm diameter sewer on Cooke Blvd south of Masonry Court is pushed to 92% full. This leg of sewer was recently replaced. However, based on the Region criteria, pipes that flow above 70% capacity will require replacement.

- Fifth design sheet **"…Proposed Phase 2 Demands- Upgrading d/s Pipes"** also goes with Dwg SA1 and is the same as the later but with the recommended legs of surcharged pipes upsized. Replacing two legs on Cooke Blvd with 375mm diameter pipe, and three legs on Cooke Blvd and three legs on Plains Road E with 450mm diameter pipes, all at the same slopes, eliminates the surcharging and reduces each pipe to less than 60% full per the Region design criteria.

- Sixth design sheet **"…Previously Approved during Phase 1 – but using Phase2"** goes with Dwg AC-SAN1(ROW). This is a step back to the second design sheet but this time using the actual population numbers for Phase 2. It represents the impact of just the full buildout of Phase 2 on the existing sanitary network without all the other intensification. This triggers the replacement of the same eight pipe legs described in the "Fifth design sheet" above, however, to a lesser extent. To meet the Region criteria, all the sewers need only be upsized to 375mm diameter pipes.

Conclusion

We trust the above meets with the City's requirement for a sanitary update based on the new connectivity. We have shown that with the forecasted populations, replacing two legs of sewer on Cooke Blvd with 375mm diameter pipe, and three legs of sewer on Cooke Blvd and three legs of sewer on Plains View Road E all with 450mm diameter pipe, will reduce the flows to less than 60%.

Yours truly,

MTE Consultants Inc.



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GPB:cnf
M:\48247\100\Reports\MTE\Sanitary Update Tech.Memo\Sanitary Update Tech.Memo.docx
Attachments.

Station West
101 Masonry Court
MTE Project #: 48247-100
Date: July 2023
By: TJL/CNF

Sanitary Demand Calculations

Location	Residential					Commercial		Total Residential and Commercial		
	Site Area (ha)	Units [6]	Population Density	Population (persons)	Demand [2] (L/s)	Floor Area (ha)	Demand [3] (L/s)	Total Demand (L/s)	Total Peaked Demand [4] (L/s)	Total Peaked Demand +Infiltration [5] (L/s)
As Desgined per Phase 1 FSR										
Entire Site	0.95		285	271	0.862			0.862	3.53	
Total Designed per Phase 1 FSR										3.80
Residential Towers (Phase 2- Building B)										
1 Bedroom [1]		63	2	126	0.401				1.507	
1 Bedroom + Den [7]		184	3	552	1.757				6.604	
2 Bedroom [1]		77	4	308	0.980				3.685	
2 Bedroom + Den [7]		34	5	170	0.541				2.034	
3 Bedroom [1]		0	6	0	0.000				0.000	
Sub Total		358		1156	3.679			3.679	**13.829**	
Commercial Area (Phase 3 - Building C)						0.0330	0.00945	0.0090	**0.0338**	
									Phase 2 Total	**13.954**
Residential Towers (Phase 3- Building C)										
Bachelor [1]		6	1	6	0.019				0.072	
1 Bedroom [1]		133	2	266	0.847				3.194	
1 Bedroom + Den [7]		103	3	309	0.984				3.710	
2 Bedroom [1]		123	4	492	1.566				5.907	
2 Bedroom + Den [7]		6	5	30	0.095				0.360	
3 Bedroom [1]		0	6	0	0.000				0.000	
Sub Total		371		1103	3.511			3.511	**13.243**	
Commercial Area (Phase 3 - Building C)						0.0165	0.00473	0.0050	**0.0189**	
									Phase 3 Total	**13.339**
Residential Towers (Phase 1- Building A)										
1 Bedroom [1]		116	2	232	0.738				2.741	
1 Bedroom + Den [7]		172	3	516	1.642				6.096	
2 Bedroom [1]		137	4	548	1.744				6.474	
2 Bedroom + Den [7]		11	5	55	0.175				0.650	
3 Bedroom [1]		0	6	0	0.000				0.000	
Sub Total		436		1351	4.300			4.300	**15.962**	
									Phase 2 Total	**16.070**
Total (Residential + Commercial) - All Phases				**3610**	**11.490**	**0.017**	**0.0047**	**11.504**	**43.052**	**43.364**

Sanitary Demand		
Residential Daily Demands [2]	275	L/ca/day
	0.0032	L/ca/sec
Commercial Space Daily Demands [3]	24.75	m^3/d/ha
	0.29	L/s/ha
Harmon PF [4] (Ex. Design)	4.10	
Harmon PF [4] (Proposed- Phase 1)	3.71	
Harmon PF [4] (Proposed- Phase 2)	3.76	
Harmon PF [4] (Proposed- Phase 3)	3.77	
Site Area- Phase 1	0.38	ha
Site Area- Phase 2	0.32	ha
Site Area- Phase 3	0.27	ha
Infiltration Allowance [5]	0.286	L/s/ha
Phase 1	0.109	L/s
Phase 2	0.092	L/s
Phase 3	0.077	L/s

Note 1: Population Density based on OBC Section 3.1.17.1, Clause 1(b). 2 Persons per bedroom
Note 2: Residential Demand based on Halton Region Design Standards
Note 3: Commercial Space Demand based on Halton Region Design Standards
Note 4:Harmon Peaking Factor = 1 + (14/(4+(P/1000)½)), 5.0 max (modified 0.8PF for commercial)
Note 5: Infiltration allowance from Halton Region Design Standards.
Note 6: Unit Count taken from Site plan by Core Architecture dated June 23, 2023, Rev.3
Note 7: Population Densities for 1 Bedroom + Den was estimated to be 3 persons per unit due to possibility of den being used as small bedroom

Station West- Phase 2 - Existing conditions
CITY OF BURLINGTON

Project No. 48247-100
Date: July 20, 2023
Designed By: EXK/CNF
Checked By: GPB
File: Q:\48247\100\SAN\48247-100 Sanitary Sewer Design Sheet.xls

SANITARY SEWER DESIGN SHEET

ENGINEERING SERVICES

DESIGN PARAMETERS

Design Flow

Design flow factor	275	L/c/d
Infiltration Factor:	0.286	L/s/ha
Mannings n:	0.015	dia < 600mm
	0.013	dia ≥ 600mm
Min Velocity:	0.6	m/s
Max Velocoty:	3	m/s

Peaking Factor

Harmon Formula

$$M = K_{pf} \times \left(1 + \frac{14}{4 + \sqrt{P + P_c}}\right)$$

$$K_{pf} = \frac{A_R + 0.80 \times (A_I + A_C)}{A_R + A_I + A_C}$$

Max Peaking factor 5
Min Peaking Factor 2

LOCATION				RESIDENTIAL							DESIGN													
																Proposed Sewer Design								
Area No.	Street Name	From MH	To MH	Incremental Area [ha]	Cumulative Area [ha]	Units (#)	Density (P/ha)	Density (P/ unit)	Population	Accum. Res. Population	Infil-tration l/s	Peaking Factor M	Average Flow l/s	Peak Flow l/s	Total Flow l/s	Diameter [mm]	Material n=0.015	Grade %	Capacity l/s	Velocity m/s	Actual Velocity m/s	% Pipe Full	Remarks	
27	Private Site	EX. MH 10A	EX. MH 9A	0.24	0.24		135.00		33	33	0.1	4.35	0.11	0.5	0.5	200	PVC	0.50%	20.4	0.64	0.27	3%		
24	Private Site	EX. MH 14A	EX. MH 13A	0.14	0.14		135.00		19	19	0.0	4.38	0.06	0.3	0.3	200	PVC	0.50%	20.4	0.64	0.23	1%		
26	Private Site	EX. MH 13A	EX. MH 11A	0.15	0.29		135.00		20	39	0.1	4.34	0.12	0.5	0.6	200	PVC	0.50%	20.4	0.64	0.29	3%		
29	Private Site	EX. MH 12A	EX. MH 11A	0.21	0.21		135.00		29	29	0.1	4.36	0.09	0.4	0.5	200	PVC	0.50%	20.4	0.64	0.26	2%		
28	Private Site	EX. MH 11A	EX. MH 9A	0.24	0.74		135.00		32	100	0.2	4.24	0.32	1.4	1.6	200	PVC	0.50%	20.4	0.64	0.38	8%		
4	Private Site	EX. MH 9A	EX. MH 8A	0.22	1.20		135.00		30	163	0.3	4.18	0.52	2.2	2.5	200	PVC	0.50%	20.4	0.64	0.44	12%		
3	Private Site	EX. SAN STUB 2 (PH1 STACKED)	EX. MH 8A	0.58	0.58	140.00		1.62	227	227	0.2	4.13	0.72	3.0	3.1	200	PVC	1.00%	28.9	0.91	0.60	11%		
21	Private Site	EX. MH 8A	EX. MH 7A	0.05	1.83		135.00		7	397	0.5	4.02	1.26	5.1	5.6	200	PVC	0.50%	20.4	0.64	0.55	27%		
20	Private Site	EX. MH 7A	EX. MH 6A	0.10	1.93					397	0.6	4.02	1.26	5.1	5.6	200	PVC	0.50%	20.4	0.64	0.55	28%		
	Private Site	EX. MH 6A	EX. MH 5A		1.93					397	0.6	4.02	1.26	5.1	5.6	200	PVC	0.50%	20.4	0.64	0.55	28%		
25	Private Site	EX. MH 17A	EX. MH16A	0.19	0.19		135.00		26	26	0.1	4.36	0.08	0.4	0.4	200	PVC	0.50%	20.4	0.64	0.26	2%		
23	Private Site	EX. MH 16A	EX. MH 15A	0.17	0.36		135.00		23	49	0.1	4.32	0.16	0.7	0.8	200	PVC	0.50%	20.4	0.64	0.31	4%		
	Cooke Blvd. (New ROW)	EX. MH 15A	EX. MH 5A		0.36					49	0.1	4.32	0.16	0.7	0.8	200	PVC	0.50%	20.4	0.64	0.31	4%		
22	Cooke Blvd. (New ROW)	EX. MH 5A	EX. MH 4A	0.05	2.34		135.00		7	453	0.7	4.00	1.44	5.8	6.4	200	PVC	0.57%	21.8	0.69	0.60	29%		
30	Cooke Blvd. (New ROW)	EX. MH 4A	EX. MH 3A	0.06	2.40					453	0.7	4.00	1.44	5.8	6.4	250	PVC	0.69%	43.5	0.88	0.63	15%		
2	Cooke Blvd. (New ROW)	SAN STUB 3 (PH2- HIGH DENSITY)	EX. MH3A	0.00	0.00		285.00		0	0	0.00	4.50	0.00	0.0	0.0	200	PVC	1.00%	28.9	0.91	0.00	0%		
5	Cooke Blvd. (New ROW)	EX. SAN C -MH 1 (PH1- MID RISE)	EX. MH 3A	0.63	0.63	188.00		1.62	305	305	0.2	4.08	0.97	4.0	4.1	200	PVC	1.56%	36.1	1.13	0.75	11%		
31	Cooke Blvd. (New ROW)	EX. MH 3A	EX. STUB 4	0.09	3.12					758	0.9	3.87	2.41	9.3	10.2	300	PVC	1.04%	85.0	1.21	0.81	12%		
	Cooke Blvd. (New ROW)	EX. SAN STUB 4	EX. EX.MH1A		3.12					758	0.9	3.87	2.41	9.3	10.2	300	PVC	1.04%	85.0	1.21	0.81	12%		

Station West- Phase 2 - Existing conditions
CITY OF BURLINGTON

Project No. 48247-100
Date: July 20, 2023
Designed By: EXK/CNF
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SANITARY SEWER DESIGN SHEET

ENGINEERING SERVICES

DESIGN PARAMETERS

Design Flow
Design flow factor 275 L/c/d
Infiltration Factor: 0.286 L/s/ha
Mannings n: 0.015 dia < 600mm
0.013 dia ≥ 600mm
Min Velocity: 0.6 m/s
Max Velocoty: 3 m/s

Peaking Factor
Harmon Formula

$$M = K_{pf} \times \left(1 + \frac{14}{4 + \sqrt{P + P_c}}\right)$$

$$K_{pf} = \frac{A_R + 0.80 \times (A_I + A_C)}{A_R + A_I + A_C}$$

Max Peaking factor 5
Min Peaking Factor 2

LOCATION				RESIDENTIAL							DESIGN													
Area No.	Street Name	From MH	To MH	Incremental Area [ha]	Cumulative Area [ha]	Units (#)	Density (P/ha)	Density (P/ unit)	Population	Accum. Res. Population	Infil-tration l/s	Peaking Factor M	Average Flow l/s	Peak Flow l/s	Total Flow l/s	Proposed Sewer Design					Actual Velocity m/s	% Pipe Full	Remarks		
																Diameter [mm]	Material n=0.015	Grade %	Capacity l/s	Velocity m/s					
16, 17, 32	Masonry Ct.	EX. MH 14204	EX. MH 14203	0.71	0.71		125.00		89	89	0.2	4.26	0.28	1.2	1.4	300	PVC	3.80%	162.4	2.31	0.70	1%			
	Masonry Ct.	EX. MH 14203	EX. MH1A		0.71				0	89	0.2	4.26	0.28	1.2	1.4	300	PVC	3.80%	162.4	2.31	0.70	1%			
12	Cooke Blvd.	EX. MH1A	EX. MH 3A	1.15	4.98		125.00		144	991	1.4	3.80	3.15	12.0	13.4	300	PVC	0.50%	58.9	0.84	0.68	23%			
	Cooke Blvd.	EX. MH 3A	EX. MH 13295		4.98		125.00		0	991	1.4	3.80	3.15	12.0	13.4	300	PVC	3.95%	165.6	2.35	1.41	8%			
13	Cooke Blvd.	EX. MH 13295	EX. MH 13301	1.42	6.40		125.00		178	1169	1.8	3.76	3.72	14.0	15.8	300	PVC	0.38%	51.4	0.73	0.64	31%			
14	Cooke Blvd.	EX. MH 13301	EX. MH 13310	1.12	7.52		125.00		140	1309	2.2	3.72	4.17	15.5	17.7	300	PVC	0.39%	52.0	0.74	0.67	34%			
	Cooke Blvd.	EX. MH 13310	EX. MH 13319		7.52				0	1309	2.2	3.72	4.17	15.5	17.7	300	PVC	0.40%	52.7	0.75	0.67	33%			
11	Plains Road	EX. MH 13339	EX. MH 13327	0.56	0.56		90.00		51	51	0.2	4.31	0.16	0.7	0.9	250	PVC	0.43%	34.3	0.69	0.29	3%			
15	Plains Road	EX. MH 13327	EX. MH 13319	0.91	1.47		125.00		114	165	0.4	4.18	0.53	2.2	2.6	250	PVC	0.43%	34.3	0.69	0.41	8%			
18	Plains Road	EX. MH 13319	EX. MH 13317	0.38	9.37		90.00		35	1509	2.7	3.68	4.80	17.7	20.3	250	PVC	0.46%	35.5	0.71	0.74	57%			
	Plains Road	EX. MH 13317	EX. MH 13314		9.37					1509	2.7	3.68	4.80	17.7	20.3	250	PVC	0.76%	45.6	0.92	0.89	45%			
19	Plains Road	EX. MH 13314	EX. MH 19205	0.68	10.05		90.00		62	1571	2.9	3.66	5.00	18.3	21.2	250	PVC	0.47%	35.9	0.72	0.75	59%			
		Indicates that the sewer requires replacement based off Halton Region Design Guidelines (sewers equal or less than 450mm diam. should be designed to no more than 60% full, and triggered for upsizing if it reaches 70% full)																							

Station West- Phase 2 - Previously Approved during Phase 1
CITY OF BURLINGTON

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SANITARY SEWER DESIGN SHEET

ENGINEERING SERVICES

DESIGN PARAMETERS

Design Flow
Design flow factor 275 L/c/d
Infiltration Factor: 0.286 L/s/ha
Mannings n: 0.015 dia < 600mm
0.013 dia ≥ 600mm
Min Velocity: 0.6 m/s
Max Velocoty: 3 m/s

Peaking Factor
Harmon Formula

$$M = K_{res} \times \left(1 + \frac{14}{4 + \sqrt{P + P_c}}\right)$$

$$K_{res} = \frac{A_a + 0.80 \times (A_i + A_{i_c})}{A_a + A_i + A_{i_c}}$$

Max Peaking factor 5
Min Peaking Factor 2

LOCATION				RESIDENTIAL							DESIGN													
Area No.	Street Name	From MH	To MH	Incremental Area [ha]	Cumulative Area [ha]	Units (#)	Density (P/ha)	Density (P/ unit)	Population	Accum. Res. Population	Infil-tration l/s	Peaking Factor M	Average Flow l/s	Peak Flow l/s	Total Flow l/s	Proposed Sewer Design					Actual Velocity m/s	% Pipe Full	Remarks
																Diameter [mm]	Material n=0.015	Grade %	Capacity l/s	Velocity m/s			
27	Private Site	EX. MH 10A	EX. MH 9A	0.24	0.24		135.00		33	33	0.1	4.35	0.11	0.5	0.5	200	PVC	0.50%	20.4	0.64	0.27	3%	
24	Private Site	EX. MH 14A	EX. MH 13A	0.14	0.14		135.00		19	19	0.0	4.38	0.06	0.3	0.3	200	PVC	0.50%	20.4	0.64	0.23	1%	
26	Private Site	EX. MH 13A	EX. MH 11A	0.15	0.29		135.00		20	39	0.1	4.34	0.12	0.5	0.6	200	PVC	0.50%	20.4	0.64	0.29	3%	
29	Private Site	EX. MH 12A	EX. MH 11A	0.21	0.21		135.00		29	29	0.1	4.36	0.09	0.4	0.5	200	PVC	0.50%	20.4	0.64	0.26	2%	
28	Private Site	EX. MH 11A	EX. MH 9A	0.24	0.74		135.00		32	100	0.2	4.24	0.32	1.4	1.6	200	PVC	0.50%	20.4	0.64	0.38	8%	
4	Private Site	EX. MH 9A	EX. MH 8A	0.22	1.20		135.00		30	163	0.3	4.18	0.52	2.2	2.5	200	PVC	0.50%	20.4	0.64	0.44	12%	
3	Private Site	EX. SAN STUB 2 (PH1 STACKED)	EX. MH 8A	0.58	0.58	140.00		1.62	227	227	0.2	4.13	0.72	3.0	3.1	200	PVC	1.00%	28.9	0.91	0.60	11%	
21	Private Site	EX. MH 8A	EX. MH 7A	0.05	1.83		135.00		7	397	0.5	4.02	1.26	5.1	5.6	200	PVC	0.50%	20.4	0.64	0.55	27%	
20	Private Site	EX. MH 7A	EX. MH 6A	0.10	1.93					397	0.6	4.02	1.26	5.1	5.6	200	PVC	0.50%	20.4	0.64	0.55	28%	
	Private Site	EX. MH 6A	EX. MH 5A		1.93					397	0.6	4.02	1.26	5.1	5.6	200	PVC	0.50%	20.4	0.64	0.55	28%	
25	Private Site	EX. MH 17A	EX. MH16A	0.19	0.19		135.00		26	26	0.1	4.36	0.08	0.4	0.4	200	PVC	0.50%	20.4	0.64	0.26	2%	
23	Private Site	EX. MH 16A	EX. MH 15A	0.17	0.36		135.00		23	49	0.1	4.32	0.16	0.7	0.8	200	PVC	0.50%	20.4	0.64	0.31	4%	
	Cooke Blvd. (New ROW)	EX. MH 15A	EX. MH 5A		0.36					49	0.1	4.32	0.16	0.7	0.8	200	PVC	0.50%	20.4	0.64	0.31	4%	
22	Cooke Blvd. (New ROW)	EX. MH 5A	EX. MH 4A	0.05	2.34		135.00		7	453	0.7	4.00	1.44	5.8	6.4	200	PVC	0.57%	21.8	0.69	0.60	29%	
30	Cooke Blvd. (New ROW)	EX. MH 4A	EX. MH 3A	0.06	2.40					453	0.7	4.00	1.44	5.8	6.4	250	PVC	0.69%	43.5	0.88	0.63	15%	
2	Cooke Blvd. (New ROW)	SAN STUB 3 (PH2- HIGH DENSITY)	EX. MH3A	0.95	0.95		285.00		271	271	0.27	4.10	0.86	3.5	3.8	200	PVC	1.00%	28.9	0.91	0.63	13%	
5	Cooke Blvd. (New ROW)	EX. SAN C -MH 1 (PH1- MID RISE)	EX. MH 3A	0.63	0.63	188.00		1.62	305	305	0.2	4.08	0.97	4.0	4.1	200	PVC	1.56%	36.1	1.13	0.75	11%	
31	Cooke Blvd. (New ROW)	EX. MH 3A	EX. STUB 4	0.09	4.07					1029	1.2	3.79	3.27	12.4	13.6	300	PVC	1.04%	85.0	1.21	0.88	16%	
	Cooke Blvd. (New ROW)	EX. SAN STUB 4	EX. EX. MH1A		4.07					1029	1.2	3.79	3.27	12.4	13.6	300	PVC	1.04%	85.0	1.21	0.88	16%	

Station West- Phase 2 - Previously Approved during Phase 1
CITY OF BURLINGTON

Project No. 48247-100
Date: July 20, 2023
Designed By: EXK/CNF
Checked By: GPB
File: Q:\48247\100\SAN\48247-100 Sanitary Sewer Design Sheet.xls

SANITARY SEWER DESIGN SHEET

ENGINEERING SERVICES

DESIGN PARAMETERS

Design Flow
Design flow factor 275 L/c/d
Infiltration Factor: 0.286 L/s/ha
Mannings n: 0.015 dia < 600mm
0.013 dia ≥ 600mm
Min Velocity: 0.6 m/s
Max Velocoty: 3 m/s

Peaking Factor
Harmon Formula

$$M = K_{pf} \times \left(1 + \frac{14}{4 + \sqrt{P + P_c}}\right)$$

$$K_{pf} = \frac{A_s + 0.80 \times (A_i + A_{ic})}{A_s + A_i + A_{ic}}$$

Max Peaking factor 5
Min Peaking Factor 2

LOCATION				RESIDENTIAL							DESIGN													
Area No.	Street Name	From MH	To MH	Incremental Area [ha]	Cumulative Area [ha]	Units (#)	Density (P/ha)	Density (P/ unit)	Population	Accum. Res. Population	Infil-tration l/s	Peaking Factor M	Average Flow l/s	Peak Flow l/s	Total Flow l/s	Proposed Sewer Design					Actual Velocity m/s	% Pipe Full	Remarks
																Diameter [mm]	Material n=0.015	Grade %	Capacity l/s	Velocity m/s			
16, 17, 32	Masonry Ct.	EX. MH 14204	EX. MH 14203	0.71	0.71		125.00		89	89	0.2	4.26	0.28	1.2	1.4	300	PVC	3.80%	162.4	2.31	0.70	1%	
	Masonry Ct.	EX. MH 14203	EX. MH1A		0.71				0	89	0.2	4.26	0.28	1.2	1.4	300	PVC	3.80%	162.4	2.31	0.70	1%	
12	Cooke Blvd.	EX. MH1A	EX. MH 3A	1.15	5.93		125.00		144	1262	1.7	3.73	4.02	15.0	16.7	300	PVC	0.50%	58.9	0.84	0.72	28%	
	Cooke Blvd.	EX. MH 3A	EX. MH 13295		5.93		125.00		0	1262	1.7	3.73	4.02	15.0	16.7	300	PVC	3.95%	165.6	2.35	1.51	10%	
13	Cooke Blvd.	EX. MH 13295	EX. MH 13301	1.42	7.35		125.00		178	1440	2.1	3.69	4.58	16.9	19.0	300	PVC	0.38%	51.4	0.73	0.68	37%	
14	Cooke Blvd.	EX. MH 13301	EX. MH 13310	1.12	8.47		125.00		140	1580	2.4	3.66	5.03	18.4	20.8	300	PVC	0.39%	52.0	0.74	0.70	40%	
	Cooke Blvd.	EX. MH 13310	EX. MH 13319		8.47				0	1580	2.4	3.66	5.03	18.4	20.8	300	PVC	0.40%	52.7	0.75	0.70	40%	
11	Plains Road	EX. MH 13339	EX. MH 13327	0.56	0.56		90.00		51	51	0.2	4.31	0.16	0.7	0.9	250	PVC	0.43%	34.3	0.69	0.29	3%	
15	Plains Road	EX. MH 13327	EX. MH 13319	0.91	1.47		125.00		114	165	0.4	4.18	0.53	2.2	2.6	250	PVC	0.43%	34.3	0.69	0.41	8%	
18	Plains Road	EX. MH 13319	EX. MH 13317	0.38	10.32		90.00		35	1780	3.0	3.62	5.66	20.5	23.5	250	PVC	0.46%	35.5	0.71	0.76	66%	Almost at 70%
	Plains Road	EX. MH 13317	EX. MH 13314		10.32					1780	3.0	3.62	5.66	20.5	23.5	250	PVC	0.76%	45.6	0.92	0.93	51%	
19	Plains Road	EX. MH 13314	EX. MH 19205	0.68	11.00		90.00		62	1842	3.1	3.61	5.86	21.2	24.3	250	PVC	0.47%	35.9	0.72	0.78	68%	Almost at 70%

Indicates that the sewer requires replacement based off Halton Region Design Guidelines (sewers equal or less than 450mm diam. should be designed to no more than 60% full, and triggered for upsizing if it reaches 70% full)

Station West- Phase 2 - Existing conditions with Other Approved Developments

CITY OF BURLINGTON

SANITARY SEWER DESIGN SHEET

ENGINEERING SERVICES

Project No. 48247-100
Date: July 20, 2023
Designed By: EXK/CNF
Checked By: GPB
File: Q:\48247\100\SAN\48247-100 Sanitary Sewer Design Sheet.xls

DESIGN PARAMETERS

Design Flow

Design flow factor	275	L/c/d
Infiltration Factor:	0.286	L/s/ha
Mannings n:	0.015	dia < 600mm
	0.013	dia ≥ 600mm
Min Velocity:	0.6	m/s
Max Velocoty:	3	m/s

Peaking Factor

Harmon Formula

$$M = K_{pf} \times \left(1 + \frac{14}{4 + \sqrt{P + P_c}}\right)$$

$$K_{pf} = \frac{A_R + 0.80 \times (A_I + A_C)}{A_R + A_I + A_C}$$

Max Peaking factor 5
Min Peaking Factor 2

LOCATION				RESIDENTIAL							DESIGN													
																Proposed Sewer Design					Actual	%	
Area No.	Street Name	From MH	To MH	Incremental Area [ha]	Cumulative Area [ha]	Units (#)	Density (P/ha)	Density (P/ unit)	Population	Accum. Res. Population	Infil-tration l/s	Peaking Factor M	Average Flow l/s	Peak Flow l/s	Total Flow l/s	Diameter [mm]	Material n=0.015	Grade %	Capacity l/s	Velocity m/s	Velocity m/s	Pipe Full	Remarks
27	Private Site	EX. MH 10A	EX. MH 9A	0.24	0.24		135.00		33	33	0.1	4.35	0.11	0.5	0.5	200	PVC	0.50%	20.4	0.64	0.27	3%	
24	Private Site	EX. MH 14A	EX. MH 13A	0.14	0.14		135.00		19	19	0.0	4.38	0.06	0.3	0.3	200	PVC	0.50%	20.4	0.64	0.23	1%	
26	Private Site	EX. MH 13A	EX. MH 11A	0.15	0.29		135.00		20	39	0.1	4.34	0.12	0.5	0.6	200	PVC	0.50%	20.4	0.64	0.29	3%	
29	Private Site	EX. MH 12A	EX. MH 11A	0.21	0.21		135.00		29	29	0.1	4.36	0.09	0.4	0.5	200	PVC	0.50%	20.4	0.64	0.26	2%	
28	Private Site	EX. MH 11A	EX. MH 9A	0.24	0.74		135.00		32	100	0.2	4.24	0.32	1.4	1.6	200	PVC	0.50%	20.4	0.64	0.38	8%	
4	Private Site	EX. MH 9A	EX. MH 8A	0.22	1.20		135.00		30	163	0.3	4.18	0.52	2.2	2.5	200	PVC	0.50%	20.4	0.64	0.44	12%	
3	Private Site	EX. SAN STUB 2 (PH1 STACKED)	EX. MH 8A	0.58	0.58	140.00		1.62	227	227	0.2	4.13	0.72	3.0	3.1	200	PVC	1.00%	28.9	0.91	0.60	11%	
21	Private Site	EX. MH 8A	EX. MH 7A	0.05	1.83		135.00		7	397	0.5	4.02	1.26	5.1	5.6	200	PVC	0.50%	20.4	0.64	0.55	27%	
20	Private Site	EX. MH 7A	EX. MH 6A	0.10	1.93					397	0.6	4.02	1.26	5.1	5.6	200	PVC	0.50%	20.4	0.64	0.55	28%	
	Private Site	EX. MH 6A	EX. MH 5A		1.93					397	0.6	4.02	1.26	5.1	5.6	200	PVC	0.50%	20.4	0.64	0.55	28%	
25	Private Site	EX. MH 17A	EX. MH16A	0.19	0.19		135.00		26	26	0.1	4.36	0.08	0.4	0.4	200	PVC	0.50%	20.4	0.64	0.26	2%	
23	Private Site	EX. MH 16A	EX. MH 15A	0.17	0.36		135.00		23	49	0.1	4.32	0.16	0.7	0.8	200	PVC	0.50%	20.4	0.64	0.31	4%	
	Cooke Blvd. (New ROW)	EX. MH 15A	EX. MH 5A		0.36					49	0.1	4.32	0.16	0.7	0.8	200	PVC	0.50%	20.4	0.64	0.31	4%	
22	Cooke Blvd. (New ROW)	EX. MH 5A	EX. MH 4A	0.05	2.34		135.00		7	453	0.7	4.00	1.44	5.8	6.4	200	PVC	0.57%	21.8	0.69	0.60	29%	
30	Cooke Blvd. (New ROW)	EX. MH 4A	EX. MH 3A	0.06	2.40					453	0.7	4.00	1.44	5.8	6.4	250	PVC	0.69%	43.5	0.88	0.63	15%	
2	Cooke Blvd. (New ROW)	SAN STUB 3 (PH2- HIGH DENSITY)	EX. MH3A	0.95	0.95		285.00		271	271	0.27	4.10	0.86	3.5	3.8	200	PVC	1.00%	28.9	0.91	0.63	13%	Approved as per Phase 1 of the development
5	Cooke Blvd. (New ROW)	EX. SAN C -MH 1 (PH1- MID RISE)	EX. MH 3A	0.63	0.63	188.00		1.62	305	305	0.2	4.08	0.97	4.0	4.1	200	PVC	1.56%	36.1	1.13	0.75	11%	
31	Cooke Blvd. (New ROW)	EX. MH 3A	EX. STUB 4	0.09	4.07					1029	1.2	3.79	3.27	12.4	13.6	300	PVC	1.04%	85.0	1.21	0.88	16%	
	Cooke Blvd. (New ROW)	EX. SAN STUB 4	EX. EX. MH1A		4.07					1029	1.2	3.79	3.27	12.4	13.6	300	PVC	1.04%	85.0	1.21	0.88	16%	

Station West- Phase 2 - Existing conditions with Other Approved Developments

CITY OF BURLINGTON

SANITARY SEWER DESIGN SHEET

ENGINEERING SERVICES

Project No. 48247-100
Date: July 20, 2023
Designed By: EXK/CNF
Checked By: GPB
File: Q:\48247\100\SAN\48247-100 Sanitary Sewer Design Sheet.xls

DESIGN PARAMETERS

Design Flow

Design flow factor	275	L/c/d
Infiltration Factor:	0.286	L/s/ha
Mannings n:	0.015	dia < 600mm
	0.013	dia ≥ 600mm
Min Velocity:	0.6	m/s
Max Velocoty:	3	m/s

Peaking Factor

Harmon Formula

$$M = K_{pf} \times \left(1 + \frac{14}{4 + \sqrt{P + P_c}}\right)$$

$$K_{pf} = \frac{A_a + 0.80 \times (A_i + A_c)}{A_a + A_i + A_c}$$

Max Peaking factor 5
Min Peaking Factor 2

LOCATION				RESIDENTIAL							DESIGN													
																Proposed Sewer Design								
Area No.	Street Name	From MH	To MH	Incremental Area [ha]	Cumulative Area [ha]	Units (#)	Density (P/ha)	Density (P/ unit)	Population	Accum. Res. Population	Infil-tration l/s	Peaking Factor M	Average Flow l/s	Peak Flow l/s	Total Flow l/s	Diameter [mm]	Material n=0.015	Grade %	Capacity l/s	Velocity m/s	Actual Velocity m/s	% Pipe Full	Remarks
16, 17, 32	Masonry Ct.	EX. MH 14204	EX. MH 14203	0.71	0.71		125.00		625	625	0.2	3.92	1.99	7.8	8.0	300	PVC	3.80%	162.4	2.31	1.20	5%	Mod.POP per Dwg SA1
	Masonry Ct.	EX. MH 14203	EX. MH1A		0.71				0	625	0.2	3.92	1.99	7.8	8.0	300	PVC	3.80%	162.4	2.31	1.20	5%	
12	Cooke Blvd.	EX. MH1A	EX. MH 3A	1.15	5.93		125.00		96	1750	1.7	3.63	5.57	20.2	21.9	300	PVC	0.50%	58.9	0.84	0.78	37%	Mod.POP per Dwg SA1
	Cooke Blvd.	EX. MH 3A	EX. MH 13295		5.93		125.00	>>	1137	2886	1.7	3.46	9.19	31.8	33.5	300	PVC	3.95%	165.6	2.35	1.84	20%	Mod.POP per Dwg SA1
13	Cooke Blvd.	EX. MH 13295	EX. MH 13301	1.42	7.35		125.00	>>	1139	4025	2.1	3.33	12.81	42.7	44.8	300	PVC	0.38%	51.4	0.73	0.82	87%	Mod.POP per Dwg SA1
14	Cooke Blvd.	EX. MH 13301	EX. MH 13310	1.12	8.47		125.00		481	4506	2.4	3.29	14.34	47.1	49.6	300	PVC	0.39%	52.0	0.74	0.84	95%	Mod.POP per Dwg SA1
	Cooke Blvd.	EX. MH 13310	EX. MH 13319		8.47				481	4987	2.4	3.25	15.87	51.5	53.9	300	PVC	0.40%	52.7	0.75	ERROR!	102%	Mod.POP per Dwg SA1
11	Plains Road	EX. MH 13339	EX. MH 13327	0.56	0.56		90.00		0	0	0.2	4.50	0.00	0.0	0.2	250	PVC	0.43%	34.3	0.69	0.18	0%	Mod.POP per Dwg SA1
15	Plains Road	EX. MH 13327	EX. MH 13319	1.09	1.65		285.00		311	311	0.5	4.07	0.99	4.0	4.5	250	PVC	0.43%	34.3	0.69	0.48	13%	
18	Plains Road	EX. MH 13319	EX. MH 13317	0.38	10.50		326.00		124	5422	3.0	3.21	17.26	55.4	58.4	250	PVC	0.46%	35.5	0.71	ERROR!	165%	
	Plains Road	EX. MH 13317	EX. MH 13314		10.50					5422	3.0	3.21	17.26	55.4	58.4	250	PVC	0.76%	45.6	0.92	ERROR!	128%	
19	Plains Road	EX. MH 13314	EX. MH 19205	0.68	11.18		90.00		506	5928	3.2	3.18	18.87	59.9	63.1	250	PVC	0.47%	35.9	0.72	ERROR!	176%	Mod.POP per Dwg SA1
		Indicates that the sewer requires replacement based off Halton Region Design Guidelines (sewers equal or less than 450mm diam. should be designed to no more than 60% full, and triggered for upsizing if it reaches 70% full)											Updated per current development projects underway as found on City of Burlington website and by BA Group's research for traffic impacts in the area.										

Station West- Phase 2 - Proposed Phase 2 Demands- No pipe upgrades

CITY OF BURLINGTON

SANITARY SEWER DESIGN SHEET

ENGINEERING SERVICES

Project No. 48247-100
Date: July 20, 2023
Designed By: EXK/CNF
Checked By: GPB
File: Q:\48247\100\SAN\48247-100 Sanitary Sewer Design Sheet.xls

DESIGN PARAMETERS

Design Flow

Design flow factor	275	L/c/d
Infiltration Factor:	0.286	L/s/ha
Mannings n:	0.015	dia < 600mm
	0.013	dia ≥ 600mm
Min Velocity:	0.6	m/s
Max Velocoty:	3	m/s

Peaking Factor

Harmon Formula

$$M = K_{pf} \times \left(1 + \frac{14}{4 + \sqrt{P + P_s}}\right)$$

$$K_{pf} = \frac{A_R + 0.80 \times (A_1 + A_2)}{A_R + A_1 + A_2}$$

Max Peaking factor	5
Min Peaking Factor	2

LOCATION				RESIDENTIAL / COMMERCIAL							DESIGN												
																Proposed Sewer Design							
Area No. (Reg. drawing SA1)	Street Name	From MH	To MH	Incremental Area [ha]	Cumulative Area [ha]	Units (#)	Density (P/ha)	Density (P/ unit)	Population	Accum. Res. Population	Infil-tration l/s	Peaking Factor M	Average Flow l/s	Peak Flow l/s	Total Flow l/s	Diameter [mm]	Material n=0.015	Grade %	Capacity l/s	Velocity m/s	Actual Velocity m/s	% Pipe Full	Remarks
27	Private Site	EX. MH 10A	EX. MH 9A	0.24	0.24		135.00		33	33	0.1	4.35	0.11	0.5	0.5	200	PVC	0.50%	20.4	0.64	0.27	3%	
24	Private Site	EX. MH 14A	EX. MH 13A	0.14	0.14		135.00		19	19	0.0	4.38	0.06	0.3	0.3	200	PVC	0.50%	20.4	0.64	0.23	1%	
26	Private Site	EX. MH 13A	EX. MH 11A	0.15	0.29		135.00		20	39	0.1	4.34	0.12	0.5	0.6	200	PVC	0.50%	20.4	0.64	0.29	3%	
29	Private Site	EX. MH 12A	EX. MH 11A	0.21	0.21		135.00		29	29	0.1	4.36	0.09	0.4	0.5	200	PVC	0.50%	20.4	0.64	0.26	2%	
28	Private Site	EX. MH 11A	EX. MH 9A	0.24	0.74		135.00		32	100	0.2	4.24	0.32	1.4	1.6	200	PVC	0.50%	20.4	0.64	0.38	8%	
4	Private Site	EX. MH 9A	EX. MH 8A	0.22	1.20		135.00		30	163	0.3	4.18	0.52	2.2	2.5	200	PVC	0.50%	20.4	0.64	0.44	12%	
3	Private Site	EX. SAN STUB 2 (PH1 STACKED)	EX. MH 8A	0.58	0.58	140.00		1.62	227	227	0.2	4.13	0.72	3.0	3.1	200	PVC	1.00%	28.9	0.91	0.60	11%	
21	Private Site	EX. MH 8A	EX. MH 7A	0.05	1.83		135.00		7	397	0.5	4.02	1.26	5.1	5.6	200	PVC	0.50%	20.4	0.64	0.55	27%	
20	Private Site	EX. MH 7A	EX. MH 6A	0.10	1.93					397	0.6	4.02	1.26	5.1	5.6	200	PVC	0.50%	20.4	0.64	0.55	28%	
	Private Site	EX. MH 6A	EX. MH 5A		1.93					397	0.6	4.02	1.26	5.1	5.6	200	PVC	0.50%	20.4	0.64	0.55	28%	
25	Private Site	EX. MH 17A	EX. MH16A	0.19	0.19		135.00		26	26	0.1	4.36	0.08	0.4	0.4	200	PVC	0.50%	20.4	0.64	0.26	2%	
23	Private Site	EX. MH 16A	EX. MH 15A	0.17	0.36		135.00		23	49	0.1	4.32	0.16	0.7	0.8	200	PVC	0.50%	20.4	0.64	0.31	4%	
	Cooke Blvd. (New ROW)	EX. MH 15A	EX. MH 5A		0.36					49	0.1	4.32	0.16	0.7	0.8	200	PVC	0.50%	20.4	0.64	0.31	4%	
22	Cooke Blvd. (New ROW)	EX. MH 5A	EX. MH 4A	0.05	2.34		135.00		7	453	0.7	4.00	1.44	5.8	6.4	200	PVC	0.57%	21.8	0.69	0.60	29%	
2A	Cooke Blvd. (New ROW)	PR.NEW-1A (PH2- HIGH DENSITY) - PHASE 1	EX. MH 4A	0.45	0.45				1351	1351	0.1	3.71	4.30	16.0	16.1	200	PVC	2.00%	40.8	1.28	1.21	39%	
30	Cooke Blvd. (New ROW)	EX. MH 4A	EX. MH 3A	0.06	2.85					1804	0.8	3.62	5.74	20.8	21.6	250	PVC	0.69%	43.5	0.88	0.87	50%	
2B	Cooke Blvd. (New ROW)	PR.NEW-3A (PH2- HIGH DENSITY) - PHASE 2	EX. MH 14204	0.30	0.30				1156	1166	0.09	3.76	3.71	13.9	14.0	200	PVC	2.00%	40.8	1.28	1.16	34%	+POP RE: COMM area. Refer to SAN calcs for detailed demands.
5	Cooke Blvd. (New ROW)	EX. SAN C -MH 1 (PH1- MID RISE)	EX. MH 3A	0.63	0.63	188.00		1.62	305	305	0.2	4.08	0.97	4.0	4.1	200	PVC	1.56%	36.1	1.13	0.75	11%	
31	Cooke Blvd. (New ROW)	EX. MH 3A	EX. SAN STUB 4	0.09	3.87					3275	1.1	3.41	10.42	35.5	36.6	300	PVC	1.04%	85.0	1.21	1.16	43%	
	Cooke Blvd. (New ROW)	EX. SAN STUB 4	EX. MH1A		3.87					3275	1.1	3.41	10.42	35.5	36.6	300	PVC	1.04%	85.0	1.21	1.16	43%	
2C	Masonry Ct.	PR.NEW-4A (PH2- HIGH DENSITY) - PHASE 3	EX. MH3A	0.22	0.22				1103	1113	0.1	3.77	3.54	13.4	13.4	200	PVC	2.00%	40.8	1.28	1.15	33%	+POP RE: COMM area. Refer to SAN calcs for detailed demands.

Station West- Phase 2 - Proposed Phase 2 Demands- No pipe upgrades

CITY OF BURLINGTON

SANITARY SEWER DESIGN SHEET

ENGINEERING SERVICES

Project No. 48247-100
Date: July 20, 2023
Designed By: EXK/CNF
Checked By: GPB
File: Q:\48247\100\SAN\48247-100 Sanitary Sewer Design Sheet.xls

DESIGN PARAMETERS

Design Flow

Design flow factor	275	L/c/d
Infiltration Factor:	0.286	L/s/ha
Mannings n:	0.015	dia < 600mm
	0.013	dia ≥ 600mm
Min Velocity:	0.6	m/s
Max Velocoty:	3	m/s

Peaking Factor

Harmon Formula

$$M = K_{pf} \times \left(1 + \frac{14}{4 + \sqrt{P + P_f}}\right)$$

$$K_{pf} = \frac{A_R + 0.80 \times (A_1 + A_2)}{A_R + A_1 + A_2}$$

Max Peaking factor	5
Min Peaking Factor	2

LOCATION				RESIDENTIAL / COMMERCIAL							DESIGN													
																Proposed Sewer Design								
Area No. (Reg. drawing SA1)	Street Name	From MH	To MH	Incremental Area [ha]	Cumulative Area [ha]	Units (#)	Density (P/ha)	Density (P/ unit)	Population	Accum. Res. Population	Infil-tration l/s	Peaking Factor M	Average Flow l/s	Peak Flow l/s	Total Flow l/s	Diameter [mm]	Material n=0.015	Grade %	Capacity l/s	Velocity m/s	Actual Velocity m/s	% Pipe Full	Remarks
16, 17, 32	Masonry Ct.	EX. MH 14204	EX. MH 14203	0.71	0.93		125.00		625	1738	0.3	3.63	5.53	20.1	20.4	300	PVC	3.80%	162.4	2.31	1.57	13%	Mod.POP per Dwg SA1
	Masonry Ct.	EX. MH 14203	EX. MH 1A		0.93				0	1738	0.3	3.63	5.53	20.1	20.4	300	PVC	3.80%	162.4	2.31	1.57	13%	
12	Cooke Blvd.	EX. MH 1A	EX. MH 3A	1.15	5.95		125.00		96	5109	1.7	3.24	16.26	52.6	54.3	**300**	PVC	0.50%	58.9	0.84	0.95	92%	Mod.POP per Dwg SA1
	Cooke Blvd.	EX. MH 3A	EX. MH 13295		5.95		125.00	>>	1137	6245	1.7	3.15	19.88	62.7	64.4	300	PVC	3.95%	165.6	2.35	2.20	39%	Mod.POP per Dwg SA1
13	Cooke Blvd.	EX. MH 13295	EX. MH 13301	1.46	7.41		125.00	>>	1141	7386	2.1	3.08	23.51	72.5	74.6	**300**	PVC	0.38%	51.4	0.73	ERROR!	145%	Mod.POP per Dwg SA1
14	Cooke Blvd.	EX. MH 13301	EX. MH 13310	1.12	8.53		125.00		481	7867	2.4	3.06	25.04	76.6	79.0	**300**	PVC	0.39%	52.0	0.74	ERROR!	152%	Mod.POP per Dwg SA1
	Cooke Blvd.	EX. MH 13310	EX. MH 13319		8.53				481	8348	2.4	3.03	26.57	80.6	83.0	**300**	PVC	0.40%	52.7	0.75	ERROR!	158%	Mod.POP per Dwg SA1
11	Plains Road	EX. MH 13339	EX. MH 13327	0.56	0.56		90.00		0	0	0.2	4.50	0.00	0.0	0.2	250	PVC	0.43%	34.3	0.69	0.18	0%	Mod.POP per Dwg SA1
15	Plains Road	EX. MH 13327	EX. MH 13319	1.09	1.65		285.00		311	311	0.5	4.07	0.99	4.0	4.5	250	PVC	0.43%	34.3	0.69	0.48	13%	
18	Plains Road	EX. MH 13319	EX. MH 13317	0.38	10.56		326.00		124	8783	3.0	3.01	27.96	84.2	87.2	**250**	PVC	0.46%	35.5	0.71	ERROR!	246%	
	Plains Road	EX. MH 13317	EX. MH 13314		10.56					8783	3.0	3.01	27.96	84.2	87.2	**250**	PVC	0.76%	45.6	0.92	ERROR!	191%	
19	Plains Road	EX. MH 13314	EX. MH 19205	0.69	11.25		90.00		507	9290	3.2	2.99	29.57	88.3	91.5	**250**	PVC	0.47%	35.9	0.72	ERROR!	255%	Mod.POP per Dwg SA1

Indicates that the sewer requires replacement based off Halton Region Design Guidelines (sewers equal or less than 450mm diam. should be designed to no more than 60% full, and triggered for upsizing if it reaches 70% full)

Updated per current development projects underway as found on City of Burlington website and by BA Group's research for traffic impacts in the area.

Station West- Phase 2 - Proposed Phase 2 Demands- Upgrading d/s Pipes

CITY OF BURLINGTON

SANITARY SEWER DESIGN SHEET

ENGINEERING SERVICES

Project No. 48247-100
Date: July 20, 2023
Designed By: EXK/CNF
Checked By: GPB
File: Q:\48247\100\SAN\48247-100 Sanitary Sewer Design Sheet.xls

DESIGN PARAMETERS

Design Flow

Design flow factor	275	L/c/d
Infiltration Factor:	0.286	L/s/ha
Mannings n:	0.015	dia < 600mm
	0.013	dia ≥ 600mm
Min Velocity:	0.6	m/s
Max Velocoty:	3	m/s

Peaking Factor

Harmon Formula

$$M = K_{ave} \times \left(1 + \frac{14}{4 + \sqrt{P}}\right)$$

$$K_{ave} = \frac{A_R + 0.80 \times (A_I + A_C)}{A_R + A_I + A_C}$$

Max Peaking factor	5
Min Peaking Factor	2

LOCATION				RESIDENTIAL / COMMERCIAL							DESIGN													
																Proposed Sewer Design								
Area No. (Reg. drawing SA1)	Street Name	From MH	To MH	Incremental Area [ha]	Cumulative Area [ha]	Units (#)	Density (P/ha)	Density (P/ unit)	Population	Accum. Res. Population	Infil-tration l/s	Peaking Factor M	Average Flow l/s	Peak Flow l/s	Total Flow l/s	Diameter [mm]	Material n=0.015	Grade %	Capacity l/s	Velocity m/s	Actual Velocity m/s	% Pipe Full	Remarks
27	Private Site	EX. MH 10A	EX. MH 9A	0.24	0.24		135.00		33	33	0.1	4.35	0.11	0.5	0.5	200	PVC	0.50%	20.4	0.64	0.27	3%	
24	Private Site	EX. MH 14A	EX. MH 13A	0.14	0.14		135.00		19	19	0.0	4.38	0.06	0.3	0.3	200	PVC	0.50%	20.4	0.64	0.23	1%	
26	Private Site	EX. MH 13A	EX. MH 11A	0.15	0.29		135.00		20	39	0.1	4.34	0.12	0.5	0.6	200	PVC	0.50%	20.4	0.64	0.29	3%	
29	Private Site	EX. MH 12A	EX. MH 11A	0.21	0.21		135.00		29	29	0.1	4.36	0.09	0.4	0.5	200	PVC	0.50%	20.4	0.64	0.26	2%	
28	Private Site	EX. MH 11A	EX. MH 9A	0.24	0.74		135.00		32	100	0.2	4.24	0.32	1.4	1.6	200	PVC	0.50%	20.4	0.64	0.38	8%	
4	Private Site	EX. MH 9A	EX. MH 8A	0.22	1.20		135.00		30	163	0.3	4.18	0.52	2.2	2.5	200	PVC	0.50%	20.4	0.64	0.44	12%	
3	Private Site	EX. SAN STUB 2 (PH1 STACKED)	EX. MH 8A	0.58	0.58	140.00		1.62	227	227	0.2	4.13	0.72	3.0	3.1	200	PVC	1.00%	28.9	0.91	0.60	11%	
21	Private Site	EX. MH 8A	EX. MH 7A	0.05	1.83		135.00		7	397	0.5	4.02	1.26	5.1	5.6	200	PVC	0.50%	20.4	0.64	0.55	27%	
20	Private Site	EX. MH 7A	EX. MH 6A	0.10	1.93					397	0.6	4.02	1.26	5.1	5.6	200	PVC	0.50%	20.4	0.64	0.55	28%	
	Private Site	EX. MH 6A	EX. MH 5A		1.93					397	0.6	4.02	1.26	5.1	5.6	200	PVC	0.50%	20.4	0.64	0.55	28%	
25	Private Site	EX. MH 17A	EX. MH16A	0.19	0.19		135.00		26	26	0.1	4.36	0.08	0.4	0.4	200	PVC	0.50%	20.4	0.64	0.26	2%	
23	Private Site	EX. MH 16A	EX. MH 15A	0.17	0.36		135.00		23	49	0.1	4.32	0.16	0.7	0.8	200	PVC	0.50%	20.4	0.64	0.31	4%	
	Cooke Blvd. (New ROW)	EX. MH 15A	EX. MH 5A		0.36					49	0.1	4.32	0.16	0.7	0.8	200	PVC	0.50%	20.4	0.64	0.31	4%	
22	Cooke Blvd. (New ROW)	EX. MH 5A	EX. MH 4A	0.05	2.34		135.00		7	453	0.7	4.00	1.44	5.8	6.4	200	PVC	0.57%	21.8	0.69	0.60	29%	
2A	Cooke Blvd. (New ROW)	PR.NEW-1A (PH2- HIGH DENSITY) - PHASE 1	EX. MH 4A	0.38	0.38				1351	1351	0.1	3.71	4.30	16.0	16.1	200	PVC	2.00%	40.8	1.28	1.21	39%	
30	Cooke Blvd. (New ROW)	EX. MH 4A	EX. MH 3A	0.06	2.78					1804	0.8	3.62	5.74	20.8	21.6	250	PVC	0.69%	43.5	0.88	0.87	50%	
2B	Cooke Blvd. (New ROW)	PR.NEW-3A (PH2- HIGH DENSITY) - PHASE 2	EX. MH 14204	0.27	0.27				1156	1166	0.08	3.76	3.71	13.9	14.0	200	PVC	2.00%	40.8	1.28	1.16	34%	+POP RE: COMM area. Refer to SAN calcs for detailed demands.
5	Cooke Blvd. (New ROW)	EX. SAN C -MH 1 (PH1- MID RISE)	EX. MH 3A	0.63	0.63	188.00		1.62	305	305	0.2	4.08	0.97	4.0	4.1	200	PVC	1.56%	36.1	1.13	0.75	11%	
31	Cooke Blvd. (New ROW)	EX. MH 3A	EX. SAN STUB 4	0.09	3.77					3275	1.1	3.41	10.42	35.5	36.6	300	PVC	1.04%	85.0	1.21	1.16	43%	
	Cooke Blvd. (New ROW)	EX. SAN STUB 4	EX. MH1A		3.77					3275	1.1	3.41	10.42	35.5	36.6	300	PVC	1.04%	85.0	1.21	1.16	43%	
2C	Masonry Ct.	PR.NEW-4A (PH2- HIGH DENSITY) - PHASE 3	EX. MH3A	0.32	0.32				1103	1113	0.1	3.77	3.54	13.4	13.4	200	PVC	2.00%	40.8	1.28	1.15	33%	+POP RE: COMM area. Refer to SAN calcs for detailed demands.

Station West- Phase 2 - Proposed Phase 2 Demands- Upgrading d/s Pipes

CITY OF BURLINGTON

SANITARY SEWER DESIGN SHEET

ENGINEERING SERVICES

Project No. 48247-100
Date: July 20, 2023
Designed By: EXK/CNF
Checked By: GPB
File: Q:\48247\100\SAN\48247-100 Sanitary Sewer Design Sheet.xls

DESIGN PARAMETERS

Design Flow

Design flow factor	275	L/c/d
Infiltration Factor:	0.286	L/s/ha
Mannings n:	0.015	dia < 600mm
	0.013	dia ≥ 600mm
Min Velocity:	0.6	m/s
Max Velocoty:	3	m/s

Peaking Factor

Harmon Formula

$$M = K_{pf} \times \left(1 + \frac{14}{4 + \sqrt{P}}\right)$$

$$K_{pf} = \frac{A_R + 0.80 \times (A_1 + A_2)}{A_R + A_1 + A_2}$$

Max Peaking factor	5
Min Peaking Factor	2

LOCATION				RESIDENTIAL / COMMERCIAL							DESIGN												
Area No. (Reg. drawing SA1)	Street Name	From MH	To MH	Incremental Area [ha]	Cumulative Area [ha]	Units (#)	Density (P/ha)	Density (P/ unit)	Population	Accum. Res. Population	Infil-tration l/s	Peaking Factor M	Average Flow l/s	Peak Flow l/s	Total Flow l/s	Proposed Sewer Design					Actual Velocity m/s	% Pipe Full	Remarks
																Diameter [mm]	Material n=0.015	Grade %	Capacity l/s	Velocity m/s			
16, 17, 32	Masonry Ct.	EX. MH 14204	EX. MH 14203	0.71	1.03		125.00		625	1738	0.3	3.63	5.53	20.1	20.4	300	PVC	3.80%	162.4	2.31	1.57	13%	Mod.POP per Dwg SA1
	Masonry Ct.	EX. MH 14203	EX. MH 1A		1.03				0	1738	0.3	3.63	5.53	20.1	20.4	300	PVC	3.80%	162.4	2.31	1.57	13%	
12	Cooke Blvd.	EX. MH 1A	EX. MH 3A	1.15	5.95		125.00		96	5109	1.7	3.24	16.26	52.6	54.3	**375**	PVC	0.50%	101.0	0.96	0.98	54%	Mod.POP per Dwg SA1
	Cooke Blvd.	EX. MH 3A	EX. MH 13295		5.95		125.00	>>	1137	6245	1.7	3.15	19.88	62.7	64.4	**375**	PVC	3.95%	283.9	2.69	2.18	23%	Mod.POP per Dwg SA1
13	Cooke Blvd.	EX. MH 13295	EX. MH 13301	1.46	7.41		125.00	>>	1141	7386	2.1	3.08	23.51	72.5	74.6	**450**	PVC	0.38%	150.4	0.95	0.95	50%	Mod.POP per Dwg SA1
14	Cooke Blvd.	EX. MH 13301	EX. MH 13310	1.12	8.53		125.00		481	7867	2.4	3.06	25.04	76.6	79.0	**450**	PVC	0.39%	152.4	0.97	0.98	52%	Mod.POP per Dwg SA1
	Cooke Blvd.	EX. MH 13310	EX. MH 13319		8.53				481	8348	2.4	3.03	26.57	80.6	83.0	**450**	PVC	0.40%	154.3	0.98	1.00	54%	Mod.POP per Dwg SA1
11	Plains Road	EX. MH 13339	EX. MH 13327	0.56	0.56		90.00		0	0	0.2	4.50	0.00	0.0	0.2	250	PVC	0.43%	34.3	0.69	0.18	0%	Mod.POP per Dwg SA1
15	Plains Road	EX. MH 13327	EX. MH 13319	1.09	1.65		285.00		311	311	0.5	4.07	0.99	4.0	4.5	250	PVC	0.43%	34.3	0.69	0.48	13%	
18	Plains Road	EX. MH 13319	EX. MH 13317	0.38	10.56		326.00		124	8783	3.0	3.01	27.96	84.2	87.2	**450**	PVC	0.46%	165.5	1.05	1.06	53%	
	Plains Road	EX. MH 13317	EX. MH 13314		10.56					8783	3.0	3.01	27.96	84.2	87.2	**450**	PVC	0.76%	212.7	1.35	1.28	41%	
19	Plains Road	EX. MH 13314	EX. MH 19205	0.69	11.25		90.00		507	9290	3.2	2.99	29.57	88.3	91.5	**450**	PVC	0.47%	167.3	1.06	1.09	55%	Mod.POP per Dwg SA1

Indicates that the sewer requires replacement based off Halton Region Design Guidelines (sewers equal or less than 450mm diam. should be designed to no more than 60% full, and triggered for upsizing if it reaches 70% full)

Proposed Pipes to be upgraded part of this development

Updated per current development projects underway as found on City of Burlington website and by BA Group's research for traffic impacts in the area.

Station West- Phase 2 - Previously Approved during Phase 1 - but using Phase2

CITY OF BURLINGTON

SANITARY SEWER DESIGN SHEET

ENGINEERING SERVICES

Project No. 48247-100
Date: July 20, 2023
Designed By: EXK/CNF
Checked By: GPB
File: Q:\48247\100\SAN\48247-100 Sanitary Sewer Design Sheet.xls

DESIGN PARAMETERS

Design Flow

Design flow factor	275	L/c/d
Infiltration Factor:	0.286	L/s/ha
Mannings n:	0.015	dia < 600mm
	0.013	dia ≥ 600mm
Min Velocity:	0.6	m/s
Max Velocoty:	3	m/s

Peaking Factor

Harmon Formula

$$M = K_{ex} \times \left(1 + \frac{14}{4 + \sqrt{P + P_c}}\right)$$

$$K_{ex} = \frac{A_s + 0.80 \times (A_i + A_c)}{A_s + A_i + A_c}$$

Max Peaking factor 5
Min Peaking Factor 2

LOCATION				RESIDENTIAL							DESIGN												
Area No.	Street Name	From MH	To MH	Incremental Area [ha]	Cumulative Area [ha]	Units (#)	Density (P/ha)	Density (P/ unit)	Population	Accum. Res. Population	Infil-tration l/s	Peaking Factor M	Average Flow l/s	Peak Flow l/s	Total Flow l/s	Proposed Sewer Design					Actual Velocity m/s	% Pipe Full	Remarks
																Diameter [mm]	Material n=0.015	Grade %	Capacity l/s	Velocity m/s			
27	Private Site	EX. MH 10A	EX. MH 9A	0.24	0.24		135.00		33	33	0.1	4.35	0.11	0.5	0.5	200	PVC	0.50%	20.4	0.64	0.27	3%	
24	Private Site	EX. MH 14A	EX. MH 13A	0.14	0.14		135.00		19	19	0.0	4.38	0.06	0.3	0.3	200	PVC	0.50%	20.4	0.64	0.23	1%	
26	Private Site	EX. MH 13A	EX. MH 11A	0.15	0.29		135.00		20	39	0.1	4.34	0.12	0.5	0.6	200	PVC	0.50%	20.4	0.64	0.29	3%	
29	Private Site	EX. MH 12A	EX. MH 11A	0.21	0.21		135.00		29	29	0.1	4.36	0.09	0.4	0.5	200	PVC	0.50%	20.4	0.64	0.26	2%	
28	Private Site	EX. MH 11A	EX. MH 9A	0.24	0.74		135.00		32	100	0.2	4.24	0.32	1.4	1.6	200	PVC	0.50%	20.4	0.64	0.38	8%	
4	Private Site	EX. MH 9A	EX. MH 8A	0.22	1.20		135.00		30	163	0.3	4.18	0.52	2.2	2.5	200	PVC	0.50%	20.4	0.64	0.44	12%	
3	Private Site	EX. SAN STUB 2 (PH1 STACKED)	EX. MH 8A	0.58	0.58	140.00		1.62	227	227	0.2	4.13	0.72	3.0	3.1	200	PVC	1.00%	28.9	0.91	0.60	11%	
21	Private Site	EX. MH 8A	EX. MH 7A	0.05	1.83		135.00		7	397	0.5	4.02	1.26	5.1	5.6	200	PVC	0.50%	20.4	0.64	0.55	27%	
20	Private Site	EX. MH 7A	EX. MH 6A	0.10	1.93					397	0.6	4.02	1.26	5.1	5.6	200	PVC	0.50%	20.4	0.64	0.55	28%	
	Private Site	EX. MH 6A	EX. MH 5A		1.93					397	0.6	4.02	1.26	5.1	5.6	200	PVC	0.50%	20.4	0.64	0.55	28%	
25	Private Site	EX. MH 17A	EX. MH16A	0.19	0.19		135.00		26	26	0.1	4.36	0.08	0.4	0.4	200	PVC	0.50%	20.4	0.64	0.26	2%	
23	Private Site	EX. MH 16A	EX. MH 15A	0.17	0.36		135.00		23	49	0.1	4.32	0.16	0.7	0.8	200	PVC	0.50%	20.4	0.64	0.31	4%	
	Cooke Blvd. (New ROW)	EX. MH 15A	EX. MH 5A		0.36					49	0.1	4.32	0.16	0.7	0.8	200	PVC	0.50%	20.4	0.64	0.31	4%	
22	Cooke Blvd. (New ROW)	EX. MH 5A	EX. MH 4A	0.05	2.34		135.00		7	453	0.7	4.00	1.44	5.8	6.4	200	PVC	0.57%	21.8	0.69	0.60	29%	
2A	Cooke Blvd. (New ROW)	PR.NEW-1A (PH2- HIGH DENSITY) - PHASE 1	EX. MH 4A	0.45	0.45				1351	1351	0.1	3.71	4.30	16.0	16.1	200	PVC	2.00%	40.8	1.28	1.21	39%	
30	Cooke Blvd. (New ROW)	EX. MH 4A	EX. MH 3A	0.06	2.85					1804	0.8	3.62	5.74	20.8	21.6	250	PVC	0.69%	43.5	0.88	0.87	50%	
2B	Cooke Blvd. (New ROW)	PR.NEW-3A (PH2- HIGH DENSITY) - PHASE 2	EX. MH 14204	0.30	0.30				1156	1166	0.09	3.76	3.71	13.9	14.0	200	PVC	2.00%	40.8	1.28	1.16	34%	+POP RE: COMM area. Refer to SAN calcs for detailed
5	Cooke Blvd. (New ROW)	EX. SAN C -MH 1 (PH1- MID RISE)	EX. MH 3A	0.63	0.63	188.00		1.62	305	305	0.2	4.08	0.97	4.0	4.1	200	PVC	1.56%	36.1	1.13	0.75	11%	
31	Cooke Blvd. (New ROW)	EX. MH 3A	EX. SAN STUB 4	0.09	3.87					3275	1.1	3.41	10.42	35.5	36.6	300	PVC	1.04%	85.0	1.21	1.16	43%	
	Cooke Blvd. (New ROW)	EX. SAN STUB 4	EX. MH1A		3.87					3275	1.1	3.41	10.42	35.5	36.6	300	PVC	1.04%	85.0	1.21	1.16	43%	
2C	Masonry Ct.	PR.NEW-4A (PH2- HIGH DENSITY) - PHASE 3	EX. MH3A	0.22	0.22				1103	1113	0.1	3.77	3.54	13.4	13.4	200	PVC	2.00%	40.8	1.28	1.15	33%	+POP RE: COMM area. Refer to SAN calcs for detailed

Station West- Phase 2 - Previously Approved during Phase 1 - but using Phase2

CITY OF BURLINGTON

SANITARY SEWER DESIGN SHEET

ENGINEERING SERVICES

Project No. 48247-100
Date: July 20, 2023
Designed By: EXK/CNF
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File: Q:\48247\100\SAN\48247-100 Sanitary Sewer Design Sheet.xls

DESIGN PARAMETERS

Design Flow

Design flow factor	275	L/c/d
Infiltration Factor:	0.286	L/s/ha
Mannings n:	0.015	dia < 600mm
	0.013	dia ≥ 600mm
Min Velocity:	0.6	m/s
Max Velocoty:	3	m/s

Peaking Factor

Harmon Formula

$$M = K_{ex} \times \left(1 + \frac{14}{4 + \sqrt{P + P_c}}\right)$$

$$K_{ex} = \frac{A_s + 0.80 \times (A_i + A_c)}{A_s + A_i + A_c}$$

Max Peaking factor	5
Min Peaking Factor	2

LOCATION				RESIDENTIAL						DESIGN													
Area No.	Street Name	From MH	To MH	Incremental Area [ha]	Cumulative Area [ha]	Units (#)	Density (P/ha)	Density (P/ unit)	Population	Accum. Res. Population	Infil-tration l/s	Peaking Factor M	Average Flow l/s	Peak Flow l/s	Total Flow l/s	Proposed Sewer Design					Actual Velocity m/s	% Pipe Full	Remarks
																Diameter [mm]	Material n=0.015	Grade %	Capacity l/s	Velocity m/s			
16, 17, 32	Masonry Ct.	EX. MH 14204	EX. MH 14203	0.71	0.93		125.00		89	1202	0.3	3.75	3.83	14.3	14.6	300	PVC	3.80%	162.4	2.31	1.43	9%	
	Masonry Ct.	EX. MH 14203	EX. MH1A		0.93				0	1202	0.3	3.75	3.83	14.3	14.6	300	PVC	3.80%	162.4	2.31	1.43	9%	
12	Cooke Blvd.	EX. MH1A	EX. MH 3A	1.15	5.95		125.00		144	4621	1.7	3.28	14.71	48.2	49.9	**300**	PVC	0.50%	58.9	0.84	0.94	85%	
	Cooke Blvd.	EX. MH 3A	EX. MH 13295		5.95		125.00		0	4621	1.7	3.28	14.71	48.2	49.9	300	PVC	3.95%	165.6	2.35	2.06	30%	
13	Cooke Blvd.	EX. MH 13295	EX. MH 13301	1.42	7.37		125.00		178	4799	2.1	3.26	15.27	49.8	51.9	**300**	PVC	0.38%	51.4	0.73	ERROR!	101%	
14	Cooke Blvd.	EX. MH 13301	EX. MH 13310	1.12	8.49		125.00		140	4939	2.4	3.25	15.72	51.1	53.5	**300**	PVC	0.39%	52.0	0.74	ERROR!	103%	
	Cooke Blvd.	EX. MH 13310	EX. MH 13319		8.49				0	4939	2.4	3.25	15.72	51.1	53.5	**300**	PVC	0.40%	52.7	0.75	ERROR!	102%	
11	Plains Road	EX. MH 13339	EX. MH 13327	0.56	0.56		90.00		51	51	0.2	4.31	0.16	0.7	0.9	250	PVC	0.43%	34.3	0.69	0.29	3%	
15	Plains Road	EX. MH 13327	EX. MH 13319	0.91	1.47		125.00		114	165	0.4	4.18	0.53	2.2	2.6	250	PVC	0.43%	34.3	0.69	0.41	8%	
18	Plains Road	EX. MH 13319	EX. MH 13317	0.38	10.34		90.00		35	5139	3.0	3.23	16.36	52.9	55.9	**250**	PVC	0.46%	35.5	0.71	ERROR!	157%	
	Plains Road	EX. MH 13317	EX. MH 13314		10.34					5139	3.0	3.23	16.36	52.9	55.9	**250**	PVC	0.76%	45.6	0.92	ERROR!	122%	
19	Plains Road	EX. MH 13314	EX. MH 19205	0.68	11.02		90.00		62	5201	3.2	3.23	16.55	53.5	56.6	**250**	PVC	0.47%	35.9	0.72	ERROR!	158%	
		Indicates that the sewer requires replacement based off Halton Region Design Guidelines (sewers equal or less than 450mm diam. should be designed to no more than 60% full, and triggered for upsizing if it reaches 70% full)																					

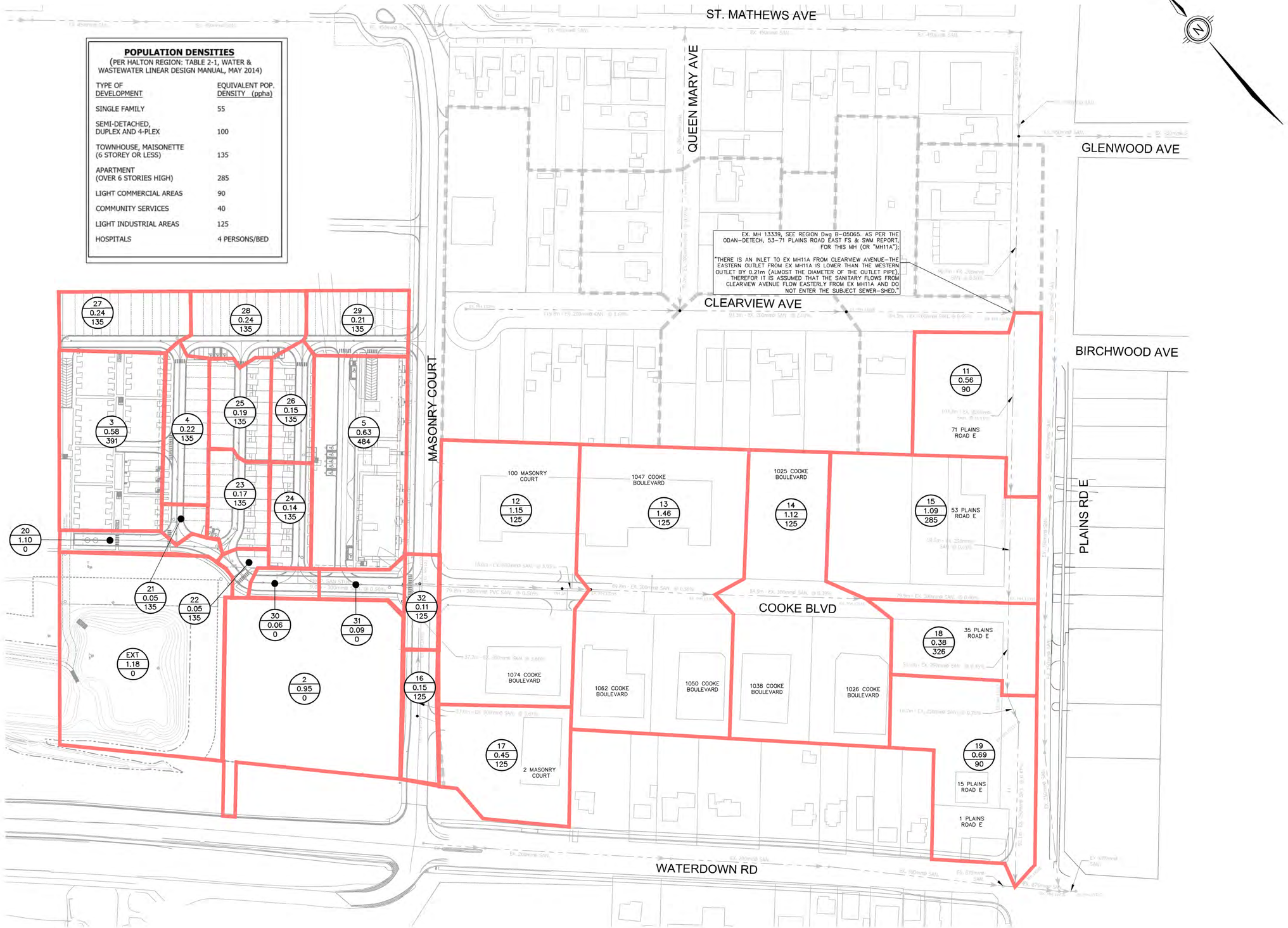
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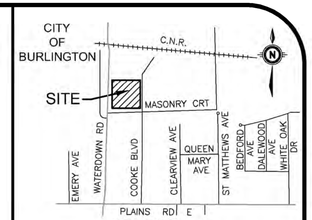
July 20, 2023 - 3:08:45 PM - Plotted By: Chirag Maniya

POPULATION DENSITIES

(PER HALTON REGION: TABLE 2-1, WATER & WASTEWATER LINEAR DESIGN MANUAL, MAY 2014)

TYPE OF DEVELOPMENT	EQUIVALENT POP. DENSITY (ppha)
SINGLE FAMILY	55
SEMI-DETACHED, DUPLEX AND 4-PLEX	100
TOWNHOUSE, MAISONETTE (6 STOREY OR LESS)	135
APARTMENT (OVER 6 STORIES HIGH)	285
LIGHT COMMERCIAL AREAS	90
COMMUNITY SERVICES	40
LIGHT INDUSTRIAL AREAS	125
HOSPITALS	4 PERSONS/BED





KEY PLAN N.T.S.

GEODETIC BM ELEV. = 100.718m

ELEVATIONS ARE REFERRED TO THE CITY OF BURLINGTON BENCHMARK NO. 0011922u2445.

SITE BENCHMARK ELEV. = m

NOTE TO CONTRACTOR :

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LEGEND

- EX. SANITARY SEWER/MANHOLE
- MH.12345 — REGION OF HALTON WASTEWATER MANHOLE No.
- CATCHMENT AREAS
- 11 / 0.56 / 90 — SUB-CATCHMENT NUMBER; AREA (ha.); POPULATION PER HECTARE (ppha)
- 2 / 0.97 / OBC — SUB-CATCHMENT NUMBER; AREA (ha.); POPULATION CALCULATED PER OBC (SEE APPENDIX B FOR CALCULATIONS)

No.	REVISION	BY	YYYY-MM-DD
8.			
7.			
6.			
5.			
4.	REVISED PER TECHNICAL MEMO	GPB	2023-07-21
3.	RE-ISSUED FOR CITY COMMENTS	GPB	2023-06-16
2.	RE-ISSUED FOR ZBA	GPB	2023-02-17
1.	ISSUED FOR ZBA	GPB	2021-11-22

MTE
Engineers, Scientists, Surveyors
905-639-2552

NOT FOR CONSTRUCTION

CLIENT
ADI DEVELOPMENT (MASONRY INC)
1100 BURLOAK DR SUITE 700 BURLINGTON, ON

PROJECT
1120 COOKE BLVD
THREE MULTI-STOREY BUILDING
1120 COOKE BLVD BURLINGTON, ON

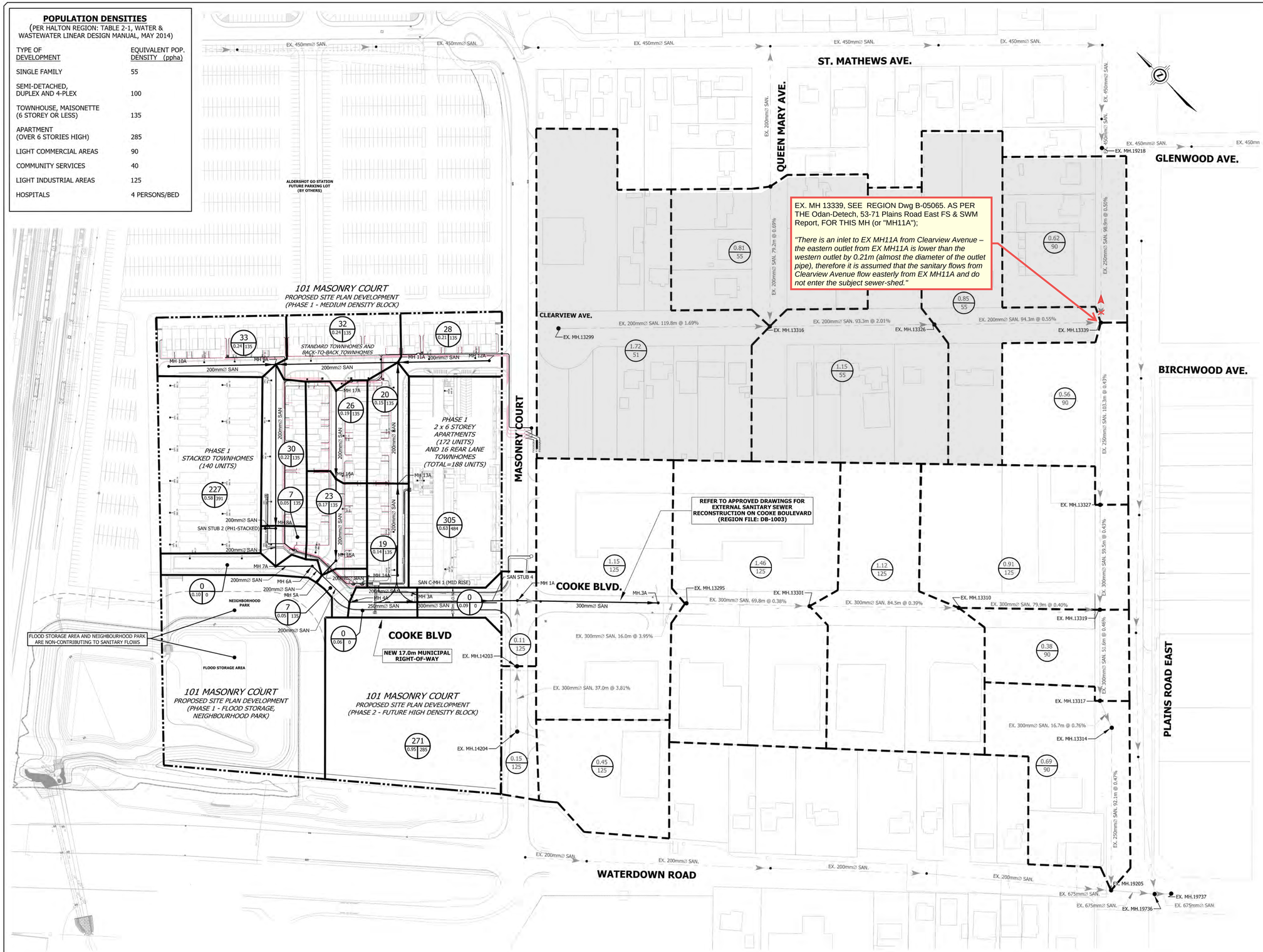
DRAWING
EXISTING CONDITIONS CATCHMENT - AREA SERVICING PLAN

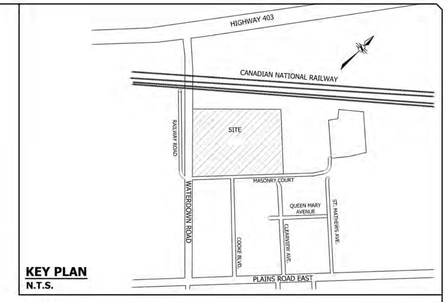
Project Manager	G. BERENYI	Project No.	48247-100
Design By	EXK/CNF	Checked By	GPB
Drawn By	LXQ/DXC	Checked By	
Surveyed By	OTHERS	Drawing No.	SA-EX
Date	Apr.19/21		
Scale	1:1000	Sheet 1 of 4	

POPULATION DENSITIES

(PER HALTON REGION: TABLE 2-1, WATER & WASTEWATER LINEAR DESIGN MANUAL, MAY 2014)

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COMMUNITY SERVICES	40
LIGHT INDUSTRIAL AREAS	125
HOSPITALS	4 PERSONS/BED





KEY PLAN
N.T.S.

LEGEND

- SITE BOUNDARY
- ROW BOUNDARY
- SANITARY SEWER/ MANHOLE
- DUAL SANITARY SERVICE
- EXISTING SANITARY SEWER/MANHOLE
- 1.00 / 125 — PROPOSED DRAINAGE AREA (ha) / POPULATION PER HECTARE (ppha)
- SANITARY DRAINAGE AREA (EXTERNAL TO SITE)
- MH.12345 — REGION OF HALTON WASTEWATER MANHOLE No.
- SANITARY DRAINAGE AREA (INTERNAL SITE WORKS)
- 13 / 135 / 0.10 — ESTIMATED POPULATION (persons) / PROPOSED DRAINAGE AREA (ha) / POPULATION PER HECTARE (ppha)

CERTIFICATION OF COMPLETION

"THIS CERTIFIES THAT THE WORK SHOWN ON THIS DRAWING RELATED TO UNDERGROUND WORKS HAS BEEN COMPLETED IN THE FIELD AS REQUIRED BY THE CITY OF HAMILTON SUBDIVISION AGREEMENT. ALL UNDERGROUND SERVICES SHOWN ARE AS-CONSTRUCTED."

ENGINEER — DATE 02/13/20

REFERENCE DRAWINGS

SITE PLAN: ICON ARCHITECTS INC., PROJECT NO. 12138, DATE: JUL. 2017, REVISED: OCT. 2017
TOPO SURVEY: J.H. GELBLOOM SURVEYING LTD., PROJECT NO. 14-125, DATE: NOV. 2014, REVISED JUL. 2017
EXISTING SERVICES: CITY OF BURLINGTON, DWG. NO. MC-4, CONTRACT NO. 14-06, DATE: JUN. 2014
REGION OF HALTON, DWG. NO. MM-22, CONTRACT NO. W-2198-04, DATE: DEC. 2006

BENCHMARK

ELEVATIONS ARE REFERRED TO THE CITY OF BURLINGTON BENCHMARK NO. 0011922u2445.
ELEVATION: 100.718m

No.	REVISION	DATE	D.L.
8	AS-CONSTRUCTED	FEB. 14/20	D.L.
7	ISSUED FOR CONSTRUCTION	JUN. 19/18	R.B.T.M.

101 MASONRY COURT
ADI DEVELOPMENT (MASONRY) INC.

CITY OF BURLINGTON
REGIONAL MUNICIPALITY OF
HALTON

CITY FILE No. 535-006/15 B — REGION FILE No. DB-1012

MUNICIPAL APPROVAL

APPROVED IN PRINCIPAL SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO TOWN STANDARDS AND SPECIFICATIONS.

SIGNED_____ DATE_____
ENGINEERING DEPARTMENT

REGIONAL APPROVAL

REGION DESIGN OF WATER SERVICES AND SANITARY SERVICES APPROVED SUBJECT TO DETAIL CONSTRUCTION CONFORMING TO HALTON REGION STANDARDS AND SPECIFICATIONS, AND LOCATION APPROVAL FROM AREA MUNICIPALITY (CITY OF BURLINGTON).

SIGNED_____ DATE_____
INFRASTRUCTURE PLANNING & POLICY

The Applicant should be aware that the approval of the water system on private property is the responsibility of the Local Municipality. Information on water system requirements (i.e. Region of Halton's standards and specifications (as incl. Water and Wastewater Linear Design Manual may be obtained from the Data Management Group at 905-825-5032). Furthermore, all water quality tests must be completed to the Region of Halton's satisfaction, before the water supply can be turned on.

urbantech west
Urbantech West, A Division of Leighton-Zec West Ltd.
2030 Bristol Circle Drive, Suite 105 Oakville, Ontario L6H 0H2
tel: 905.829.8818 fax: 905.829.4804
www.urbantech.com

LICENSED PROFESSIONAL ENGINEER — D. LUC — 100054751 — 02/13/2020 — PROVINCE OF ONTARIO

SANITARY DRAINAGE AREA PLAN

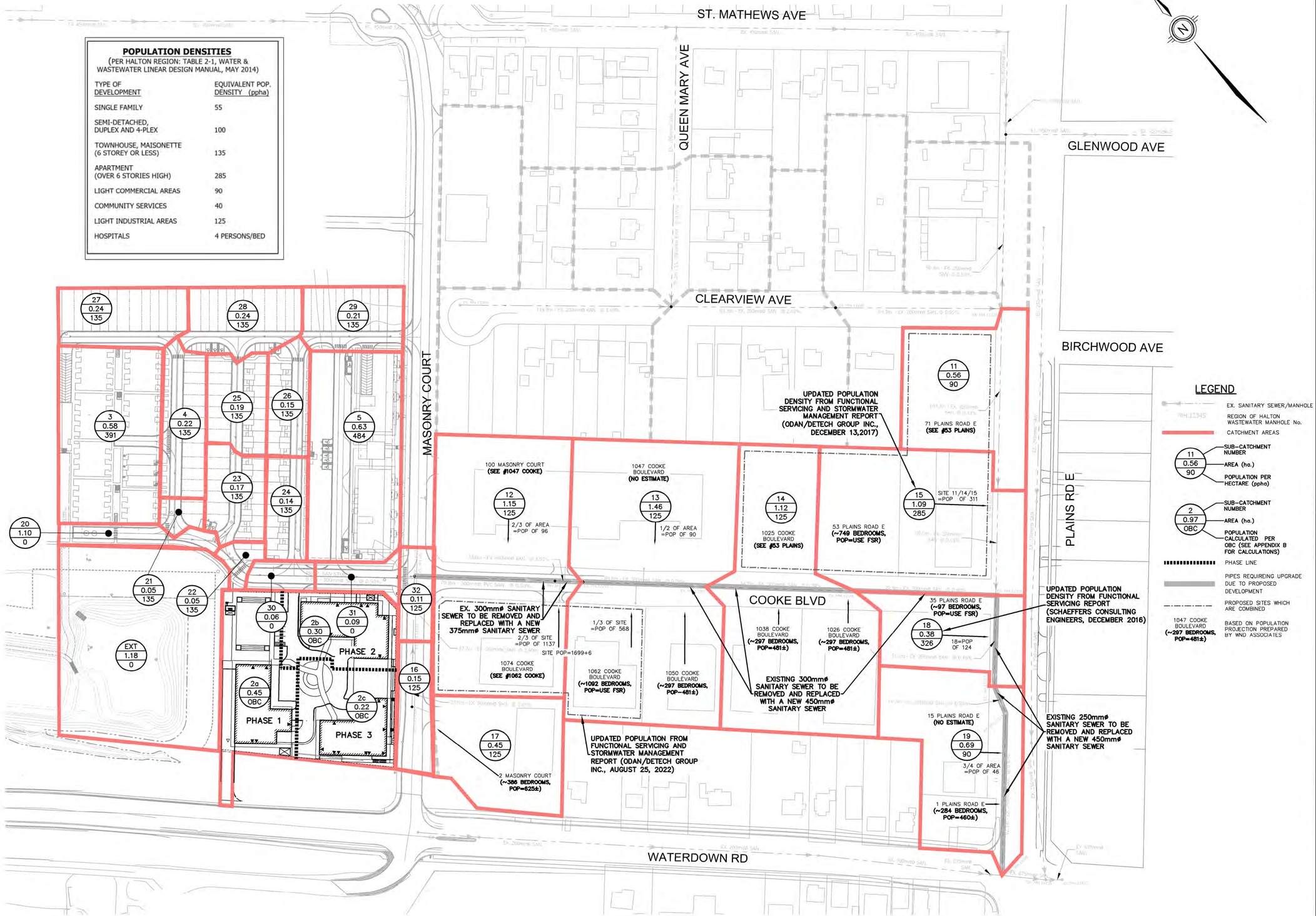
DESIGNED: P.H.	CHECKED: P.H.	PROJECT No.:	14-137W
DRAWN: N.M.	DATE: OCTOBER 2017	SHEET No.:	1 OF 5
SCALE: 1:500 (5m 0m 5m 10m 20m)		DRAWING No.:	AC-SAN1(ROW)

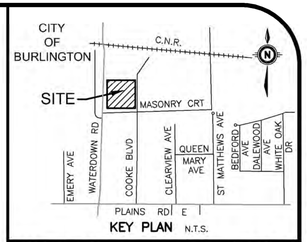
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July 20, 2023 - 3:19:38 PM - Plotted By: Chirag Maniya

POPULATION DENSITIES
(PER HALTON REGION: TABLE 2-1, WATER & WASTEWATER LINEAR DESIGN MANUAL, MAY 2014)

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HOSPITALS	4 PERSONS/BED





GEODETIC BM **ELEV. = 100.718m**
ELEVATIONS ARE REFERRED TO THE CITY OF BURLINGTON BENCHMARK NO. 0011922u2445.

SITE BENCHMARK **ELEV. = m**

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No.	REVISION	BY	YYYY-MM-DD
8.			
7.			
6.			
5.			
4.	REVISED PER TECHNICAL MEMO	GPB	2023-07-21
3.	RE-ISSUED FOR CITY COMMENTS	GPB	2023-06-16
2.	RE-ISSUED FOR ZBA	GPB	2023-02-17
1.	ISSUED FOR ZBA	GPB	2021-11-22

MTE
Engineers, Scientists, Surveyors
905-639-2552

NOT FOR CONSTRUCTION

CLIENT
ADI DEVELOPMENT (MASONRY INC)
1100 BURLOAK DR SUITE 700 BURLINGTON, ON

PROJECT
1120 COOKE BLVD
THREE MULTI-STOREY BUILDING
1120 COOKE BLVD BURLINGTON, ON

DRAWING
EXTERNAL SANITARY SEWER CATCHMENT - AREA SERVICING PLAN

Project Manager	G. BERENYI	Project No.	48247-100
Design By	EXK/CNF	Checked By	GPB
Drawn By	LXQ/DXC	Checked By	GPB
Surveyed By	OTHERS	Drawing No.	SA1
Date	Apr.19/21		
Scale	1:1000	Sheet 2 of 4	

	Number	Street	Current Use/Application Status	Approved Use	Proposed Use (Applicant)	Proposed Use (Precinct Plan)	Exisiting/Approved Residential Units	Anticipated Residential Units	Estimated Bedrooms	
N/A		Clearview (West Side)								N/A
	1022	Clearview Ave	Detached dwelling	N/A	N/A	Outside MTSA	1		3	
	1032	Clearview Ave	Detached dwelling	N/A	N/A	Outside MTSA	1		3	
	1040	Clearview Ave	Detached dwelling	N/A	N/A	Outside MTSA	1		3	
	1048	Clearview Ave	Detached dwelling	N/A	N/A	Outside MTSA	1		3	
	1050	Clearview Ave	Detached dwelling	N/A	N/A	Outside MTSA	1		3	
	1060	Clearview Ave	Detached dwelling	N/A	N/A	Outside MTSA	1		3	
	1068	Clearview Ave	Detached dwelling	N/A	N/A	Outside MTSA	1		3	
	1072	Clearview Ave	Detached dwelling	N/A	N/A	Outside MTSA	1		3	
	1076	Clearview Ave	Detached dwelling	N/A	N/A	Outside MTSA	1		3	
	1080	Clearview Ave	Detached dwelling	N/A	N/A	Outside MTSA	1		3	
	1084	Clearview Ave	Detached dwelling	N/A	N/A	Outside MTSA	1		3	
	1088	Clearview Ave	Detached dwelling	N/A	N/A	Outside MTSA	1		3	
		Clearview (East Side)								
	1019	Clearview Ave	Detached dwelling	N/A	N/A	Outside MTSA	1		3	
	1025	Clearview Ave	Detached dwelling	N/A	N/A	Outside MTSA	1		3	
	1035	Clearview Ave	Detached dwelling	N/A	N/A	Outside MTSA	1		3	
	1043	Clearview Ave	Detached dwelling	N/A	N/A	Outside MTSA	1		3	
	1045	Clearview Ave	Detached dwelling	N/A	N/A	Outside MTSA	1		3	
	1061	Clearview Ave	Detached dwelling	N/A	N/A	Outside MTSA	1		3	
	1064	Clearview Ave	Detached dwelling	N/A	N/A	Outside MTSA	1		3	
	1073	Clearview Ave	Detached dwelling	N/A	N/A	Outside MTSA	1		3	
	1077	Clearview Ave	Detached dwelling	N/A	N/A	Outside MTSA	1		3	
	1085	Clearview Ave	OLT approved		7-storey RES bldg	11 storeys	164		221	
	1082	St. Matthews Ave				11 storeys				
	1086	St. Matthews Ave				11 storeys				
	1090	St. Matthews Ave				11 storeys				
		Cooke (West Side)								
	1026	Cooke Blvd	Employment	N/A	N/A	19 storeys		220	297	
	1038	Cooke Blvd	Employment	N/A	N/A	19 storeys		220	297	
	1050	Cooke Blvd	Employment	N/A	N/A	19 storeys		220	297	
	1062	Cooke Blvd	OPA/ZBA under appeal		32&30-st mixed-use bldgs	19 storeys		809	1092	
	1074	Cooke Blvd				30 storeys				
		Cooke (East Side)								
	1025	Cooke Blvd	See 53 Plains	N/A	N/A	11 storeys				
	-	Cooke Blvd	Vacant	N/A	Public Park (see 53 Plains)	-				
	1047	Cooke Blvd	Employment	N/A	N/A	11 storeys				
		Cooke (Stationwest)								
	1120	Cooke Blvd	SUBJECT SITE			30 storeys		1,165	1,553	
	1117	Cooke Blvd	SW Phase 1			30 storeys	425		574	
	1121	Cooke Blvd	SW Phase 1			30 storeys				
	1127	Cooke Blvd	SW Phase 1			30 storeys				
	1129	Cooke Blvd	SW Phase 1			30 storeys				
	1131	Cooke Blvd	SW Phase 1			30 storeys				
	1133	Cooke Blvd	SW Phase 1			30 storeys				
	1135	Cooke Blvd	SW Phase 1			30 storeys				
	1137	Cooke Blvd	SW Phase 1			30 storeys				

	Number	Street	Current Use/Application Status	Approved Use	Proposed Use (Applicant)	Proposed Use (Precinct Plan)	Exisiting/Approved Residential Units	Anticipated Residential Units	Estimated Bedrooms	
N/A		Clearview (West Side)								N/A
	1139	Cooke Blvd	SW Phase 1			30 storeys				
	1141	Cooke Blvd	SW Phase 1			30 storeys				
	-	Cooke Blvd	SWM Facility			-				
		Masonry Crt (S side)								
	2	Masonry Court	PAC initiated		37-storey mixed use			286	386	
	100	Masonry Court	see 1047 Cooke	<<-- original said "1085 Clearview" ??						
		Queen Mary (S side)								
	88	Queen Mary Ave	Detached dwelling	N/A	N/A	Outside MTSA	1		3	
	94	Queen Mary Ave	Detached dwelling	N/A	N/A	Outside MTSA	1		3	
	100	Queen Mary Ave	Detached dwelling	N/A	N/A	Outside MTSA	1		3	
		Queen Mary (N side)								
	93	Queen Mary Ave	Detached dwelling	N/A	N/A	Outside MTSA	1		3	
	99	Queen Mary Ave	Detached dwelling	N/A	N/A	Outside MTSA	1		3	
		Plains (N side)								
	1	Plains Road East		N/A	N/A	11 storeys		210	284	
	15	Plains Road East		N/A	N/A	11 storeys			0	
	35	Plains Road East			8-storey mixed use			72	97	
	53	Plains Road East	Approved by OLT	9 & 18 storey mixed-use			555		749	
	71	Plains Road East								
	1025	Cooke Blvd								
	91	Plains Road East		N/A	N/A	11 storeys		190	257	
	99	Plains Road East		N/A	N/A	11 storeys				
	105	Plains Road East		N/A	N/A	11 storeys				
	Total						980	3202		

NEW TRIBUTARY SAN AREA (Clearview Ave flows east at Plains Road, not incl.):	Grand TOTAL	4182	5626	