

Appendix I

Sanitary Sewer Design Sheets



SANITARY SEWER DESIGN SHEET

FRUITLAND -WINONA SECONDARY PLAN AREA-BLOCK 1

EXCLUDING GREENBELT LANDS

City of Hamilton

PROJECT DETAILS

Project No: 20-263

Date: 25-Apr-24

Designed by: E.L.

Checked by: S.H

DESIGN CRITERIA

Min Diameter = 250 mm

Mannings 'n' = 0.015

Min. Velocity = 0.75

Max. Velocity = 2.75

Avg. Domestic Flow = 360.0 l/c/d

Infiltration = 0.600 l/s/ha

Max. Peaking Factor = 5.00

Min. Peaking Factor= 2.00

$$M = \frac{5}{P^{0.2}}$$

Denotes overcapacity sewer

NOMINAL PIPE SIZE USED

STREET	FROM MH	TO MH	RESIDENTIAL							COMMERCIAL/INDUSTRIAL/INSTITUTIONAL/MIXED USE							FLOW CALCULATIONS							PIPE DATA					
			AREA (ha)	ACC. AREA (ha)	UNITS (#)	DENISTY (P/ha)	DENSITY (P/unit)	POP	ACCUM. RES. POP.	AREA (ha)	AREA ID	ACC. AREA (ha)	EQUIV. POP. (p/ha)	FLOW RATE (l/s/ha)	EQUIV. POP.	ACCUM. EQUIV. POP.	INFILTRATION (l/s)	TOTAL ACCUM. POP.	PEAKING FACTOR	RES. FLOW (l/s)	COMM. FLOW (l/s)	ACCUM. COMM. FLOW (l/s)	TOTAL FLOW (l/s)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (l/s)	FULL FLOW VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	PERCENT FULL (%)
FRUITLAND SEWERSHED																													
REGALVIEW DRIVE	SI07A012	SI07A014	11.30	11.30		60		678	678							6.8	678	5.00	14.1				20.9	1.16	300	90.3	1.28	1.01	23%
REGALVIEW DRIVE	SI07A014	SI07A015	1.50	12.80		60		90	768							7.7	768	5.00	16.0				23.7	1.13	300	89.1	1.26	1.05	27%
HIGHWAY 8	SI07A039	SI07A015								2.60		2.60	40		105	105	1.6	105	5.00	2.2			3.7	0.40	250	32.6	0.66	0.44	11%
HIGHWAY 8	FUTURE 2	SI07A015								1.90	SW8, EX	1.90	68		130	130	1.1	130	5.00	2.7			3.8	0.40	250	32.6	0.66	0.44	12%
FRUITLAND ROAD	SI07A015	SI06A001		12.80					768	1.70	F4, EX	6.20	48		81	316	11.4	1084	4.92	22.2			33.6	0.40	375	96.1	0.87	0.78	35%
FRUITLAND ROAD	SI06A001	SI06A002	1.60	14.40		65		104	872		F3.5, EX	6.20				316	12.4	1188	4.83	23.9			36.3	0.40	375	96.1	0.87	0.78	38%
FRUITLAND ROAD	SI06A002	SI06A003	0.80	15.20		65		52	924		F3.4, EX	6.20				316	12.8	1240	4.79	24.7			37.6	0.40	375	96.1	0.87	0.78	39%
FRUITLAND ROAD	SI06A003	SI06A005	1.30	16.50		66		86	1010		F3.3, EX	6.20				316	13.6	1326	4.73	26.1			39.7	0.40	375	96.1	0.87	0.81	41%
FRUITLAND ROAD	SI06A005	SI06A007	0.80	17.30		58		46	1056		F3.2, EX	6.20				316	14.1	1372	4.69	26.8			40.9	0.40	375	96.1	0.87	0.81	43%
FRUITLAND ROAD	SI06A007	SI06A009	0.80	18.10		64		51	1107		F3.1, EX	6.20				316	14.6	1423	4.66	27.6			42.2	0.40	375	96.1	0.87	0.81	44%
SHERWOOD PARK ROAD	SI06A014	SI06A013								7.90		7.90	12		95	95	4.7	95	5.00	2.0			6.7	0.40	250	32.6	0.66	0.51	21%
SHERWOOD PARK ROAD	SI06A013	SI06A012	0.30	0.30		60		18	18			7.90				95	4.9	113	5.00	2.4			7.3	0.40	250	32.6	0.66	0.52	22%
SHERWOOD PARK ROAD	SI06A012	SI06A009		0.30					18			7.90				95	4.9	113	5.00	2.4			7.3	0.40	250	32.6	0.66	0.52	22%
STREET B	FUTURE 4	SI06A009	0.20	0.20							F2.4						0.1						0.1	0.50	250	36.4	0.74	0.19	0%
FRUITLAND ROAD	SI06A009	SI05A023	0.70	19.30		64		45	1170		F2.4, EX	14.10				411	20.0	1581	4.56	30.1			50.1	0.40	450	156.3	0.98	0.85	32%
FRUITLAND ROAD	SI05A023	SI05A013	1.10	20.40		62		68	1238		F2.3, EX	14.10				411	20.7	1649	4.52	31.1			51.8	0.40	450	156.3	0.98	0.85	33%
FRUITLAND ROAD	SI05A013	SI05A012	0.80	21.20		64		51	1289		F2.2, EX	14.10				411	21.2	1700	4.50	31.9			53.0	0.40	450	156.3	0.98	0.85	34%
FRUITLAND ROAD	SI05A012	SI05A010	0.60	21.80		65		39	1328		F2.1, EX	14.10				411	21.5	1739	4.48	32.4			54.0	0.40	450	156.3	0.98	0.88	35%
SANDY DRIVE	SI05A021	SI05A010	6.70	6.70		60		402	402							4.0	402	5.00	8.4			12.4	0.60	250	39.9	0.81	0.71	31%	
FRUITLAND ROAD	SI05A010	SI05A008	0.60	29.10		73		44	1774		F1, EX	14.10				411	25.9	2185	4.28	38.9			64.9	0.40	450	156.3	0.98	0.91	41%
FRUITLAND ROAD	SI05A008	SI05A006		29.10					1774	1.20		15.30	94		113	524	26.6	2298	4.23	40.5			67.2	0.40	450	156.3	0.98	0.91	43%
BARTON STREET	SI05A007	SI05A006								11.50		11.50	102		1177	1177	6.9	1177	4.84	23.7			30.6	0.40	375	96.1	0.87	0.76	32%
BARTON STREET	SI05A015	SI05A016	1.70	1.70		198		337	337		B3.3, EX					1.0	337	5.00	7.0			8.0	0.35	300	49.6	0.70	0.51	16%	
BARTON STREET	SI05A016	MH12A	1.70	3.40		176		299	636		B3.4, EX					2.0	636	5.00	13.3			15.3	0.35	300	49.6	0.70	0.61	31%	
BLOCK 1 SEWERSHED																													
GORDON DEAN AVE	MH1A	MH2A	2.70	2.70		89		240	240		SW9, SW10, & SE6					1.6	240	5.00	5.0			6.6	1.25	250	57.6	1.17	0.77	11%	
GORDON DEAN AVE	MH2A	MH3A	5.90	8.60		179		1055	1295		SW6 & SW7					5.2	1295	4.75	25.6			30.8	1.25	250	57.6	1.17	1.16	53%	
GORDON DEAN AVE	MH3A	MH9A	6.80	15.40		176		1200	2495		SW2, RD1					9.2	2495	4.16	43.3			52.5	1.00	300	83.8	1.19	1.22	63%	
STREET B	MH5A	MH6A	1.80	1.80		110		198	198		NW2 & SW1					1.1	198	5.00	4.1			5.2	0.50	250	36.4	0.74	0.52	14%	
STREET B	MH6A	MH9A	10.10	11.90		66		664	862		SW3.1, SW3-5, RD2					7.1	862	5.00	18.0			25.1	0.50	250	36.4	0.74	0.78	69%	
STREET B	MH7A	MH8A	3.60	3.60		86		308	308		SE2.1, SE3					2.2	308	5.00	6.4			8.6	1.00	250	51.5	1.05	0.78	17%	
STREET B	MH8A	MH9A	2.75	6.35		187		513	821		SE1, RD3					3.8	821	5.00	17.1			20.9	0.50	250	36.4	0.74	0.75	57%	
GORDON DEAN AVE	MH9A	MH10A	10.55	44.20		88		929	5107		NW4 & NE1					26.5	5107	3.61	76.8			103.3	0.50	450	174.7	1.10	1.11	59%	
GORDON DEAN AVE	MH10A	MH11A	6.70	50.90		84		562	5669		NW1 & NW3					30.5	5669	3.53	83.5			114.0	1.00	450	247.1	1.55	1.49	46%	
GORDON DEAN AVE	MH11A	MH12A	1.70	52.60					5669		RD4					31.6	5669	3.53	83.5			115.0	1.00	450	247.1	1.55	1.49	47%	
BARTON STREET	MH12A	MH13A	0.60	56.60		60		36	6341							34.0	6341	3.46	91.3			125.3	0.50	525	263.6	1.22	1.17	48%	
BARTON STREET	MH13A	SI05A021	0.60	57.20		60		36	6377							34.3	6377	3.45	91.7			126.0	0.35	525	220.5	1.02	1.03	57%	
BARTON STREET	SI05A021	SI05A001	0.80	58.00		60		48	6425							34.8	6425	3.45	92.3			127.1	0.35	525	220.5	1.02	1.03	58%	
BARTON STREET	SI05A001	SI05A002	2.00	60.00		146		292	6717		B2, EX					36.0	6717	3.42	95.6			131.6	0.35	525	220.5	1.02	1.05	60%	
BARTON STREET	SI05A002	SI05A003	2.90	62.90		78		228	6945		B1.2, EX					37.7	6945	3.39	98.2			135.9	0.30	525	204.1	0.94	0.99	67%	
BARTON STREET	SI05A003	SI05A004		62.90					6945	1.60	B1.1, EX	1.60	94		150	150	38.7	7095	3.38	99.9			138.6	0.30	525	204.1	0.94	0.99	68%
BARTON STREET	SI05A004	SI05A006		62.90					6945			1.60				150	38.7	7095	3.38	99.9			138.6	0.30	525	204.1	0.94	0.99	68%
FRUITLAND (N OF BARTON)																													
FRUITLAND ROAD	SI05A006	SI05A005	0.60	92.60		125		75	8794			28.40				72.6	10645	3.12	138.2			210.8	0.40	600	336.6	1.19	1.23	63%	
FRUITLAND ROAD	SI05A005	SI04A004	3.20	95.80		125		400	9194			28.40				74.5	11045	3.09	142.3			216.8	0.40	600	336.6	1.19	1.23	64%	
FRUITLAND ROAD	SI04A004	SI04A005	2.30	98.10		125		288	9482			28.40				75.9	11333	3.08	145.3			221.2	0.40	600	336.6	1.19	1.25	66%	
FRUITLAND ROAD	SI04A005	SI04A008	1.60	99.70		125		200	9682			28.40				76.9	11533	3.07	147.3			224.2	0.40	600	336.6	1.19	1.25	67%	
ARVIN AVENUE	SI04A006	SI04A008	27.40	27.40		125		3425	3425							16.4	3425	3.91	55.8			72.2	0.35	450	146.2	0.92	0.88	49%	
ARVIN AVENUE	SI04A007	SI04A008	13.80	13.80		125		1725	1725							8.3	1725	4.48	32.2			40.5	0.60	375	117.7	1.07	0.93	34%	

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SANITARY SEWER DESIGN SHEET

FRUITLAND -WINONA SECONDARY PLAN AREA-BLOCK 1

EXCLUDING GREENBELT LANDS

City of Hamilton

PROJECT DETAILS

Project No: 20-263

Date: 25-Apr-24

Designed by: E.L.

Checked by: S.H.

DESIGN CRITERIA

Min Diameter = 250 mm

Avg. Domestic Flow = 360.0 l/c/d

Mannings 'n'= 0.015

Infiltration = 0.600 l/s/ha

Min. Velocity = 0.75 m/s

Max. Peaking Factor = 5.00

Max. Velocity = 2.75 m/s

Min. Peaking Factor= 2.00

Factor of Safety = 25 %

$M = \frac{5}{P^{0.2}}$

Denotes overcapacity sewer

NOMINAL PIPE SIZE USED

STREET	FROM MH	TO MH	RESIDENTIAL							COMMERCIAL/INDUSTRIAL/INSTITUTIONAL/MIXED USE							FLOW CALCULATIONS							PIPE DATA					
			AREA (ha)	ACC. AREA (ha)	UNITS (#)	DENISTY (P/ha)	DENSITY (P/unit)	POP	ACCUM. RES. POP.	AREA (ha)	AREA ID	ACC. AREA (ha)	EQUIV. POP. (p/ha)	FLOW RATE (l/s/ha)	EQUIV. POP.	ACCUM. EQUIV. POP.	INFILTRATION (l/s)	TOTAL ACCUM. POP.	PEAKING FACTOR	RES. FLOW (l/s)	COMM. FLOW (l/s)	ACCUM. COMM. FLOW (l/s)	TOTAL FLOW (l/s)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (l/s)	FULL FLOW VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	PERCENT FULL (%)
FRUITLAND ROAD	SI04A008	SI04A011	0.40	141.30		125		50	14882			28.40				1851	101.8	16733	2.85	198.4			300.3	0.75	600	460.8	1.63	1.71	65%
FRUITLAND ROAD	SI04A011	SI04A014	0.50	141.80		125		63	14945			28.40				1851	102.1	16796	2.84	199.0			301.2	0.75	600	460.8	1.63	1.71	65%
FRUITLAND ROAD	SI04A014	SI03A004	1.90	143.70		125		238	15183			28.40				1851	103.3	17034	2.84	201.3			304.5	0.40	675	460.8	1.29	1.35	66%
S. SERVICE ROAD	SI03A004	SI03A003		143.70					15183			28.40				1851	103.3	17034	2.84	201.3			304.5	0.40	675	460.8	1.29	1.35	66%
JONES ROAD SEWERSHED																													
JONES ROAD	EXISTING	SJ06A001								6.60	SE4, SE7	6.60	7		45	45	4.0	45	5.00	0.9			4.9	0.50	250	36.4	0.74	0.51	13%
JONES ROAD	SJ06A001	SJ06A002								2.20	J5.1, SE5.1, EX	8.80	114		250	295	5.3	295	5.00	6.1			11.4	0.50	375	107.4	0.97	0.64	11%
JONES ROAD	SJ06A002	SJ06A003								2.70	J5.2, SE5.2, EX	11.50	111		300	595	6.9	595	5.00	12.4			19.3	0.50	375	107.4	0.97	0.73	18%
JONES ROAD	SJ06A003	SJ06A004	3.00	3.00		141		423	423		J4.1, SE2.2	11.50			595	595	8.7	1018	4.98	21.1			29.8	0.50	375	107.4	0.97	0.83	28%
JONES ROAD	SJ06A004	SJ06A005	1.10	4.10		159		175	598		J4.2, EX	11.50			595	595	9.4	1193	4.83	24.0			33.4	1.90	375	209.5	1.90	1.38	16%
JONES ROAD	SJ06A005	SJ05A005	3.40	7.50		122		415	1013		J3.2, NE3, EX	11.50			595	595	11.4	1608	4.55	30.5			41.9	1.00	375	152.0	1.38	1.17	28%
JONES ROAD	SJ05A005	SJ05A006	1.20	8.70		188		225	1238		J3.1, EX	11.50			595	595	12.1	1833	4.43	33.8			45.9	0.70	450	206.7	1.30	1.03	22%
JONES ROAD	SJ05A006	SJ05A007	2.80	11.50		223		625	1863		J1, NE2, EX	11.50			595	595	13.8	2458	4.18	42.8			56.6	0.50	450	174.7	1.10	0.96	32%
JONES ROAD	SJ05A007	SJ05A008	2.70	14.20		65		175	2038		JO, B3.1, EX	11.50			595	595	15.4	2633	4.12	45.2			60.6	0.50	450	174.7	1.10	0.99	35%
BARTON STREET	SJ05A012	SJ05A011	0.60	0.60		60		36	36								0.4	36	5.00	0.8			1.1	0.40	300	53.0	0.75	0.26	2%
BARTON STREET	SJ05A011	SJ05A010	1.60	2.20		203		325	361		B3.2, EX						1.3	361	5.00	7.5			8.8	0.40	300	53.0	0.75	0.55	17%
BARTON STREET	SJ05A010	SJ05A008		2.20					361								1.3	361	5.00	7.5			8.8	0.40	300	53.0	0.75	0.55	17%
BLOCK 2	BLOCK 2	SJ05A002	32.67	32.67		161		5271	5271		BLK2						19.6	5271	3.59	78.8			98.4	0.30	450	135.3	0.85	0.91	73%
BARTON STREET	SJ05A002	SJ05A003		32.67					5271								19.6	5271	3.59	78.8			98.4	0.30	450	135.3	0.85	0.91	73%
BARTON STREET	SJ05A003	SJ05A008		32.67					5271								19.6	5271	3.59	78.8			98.4	0.30	450	135.3	0.85	0.91	73%
JONES ROAD	SJ05A008	SJ05A009		49.07					7670	0.80		12.30	60		48	643	36.8	8313	3.27	113.4			150.2	0.30	525	204.1	0.94	1.01	74%
JONES ROAD	SJ05A009	SJ04A001		49.07					7670	4.00		16.30	75		300	943	39.2	8613	3.25	116.6			155.9	0.30	525	204.1	0.94	1.03	76%
JONES ROAD	SJ04A001	SJ04A002		49.07					7670	4.90		21.20	125		613	1556	42.2	9226	3.21	123.2			165.4	0.30	525	204.1	0.94	1.04	81%
JONES ROAD	SJ04A002	SJ04A003		49.07					7670			21.20			1556	42.2	9226	3.21	123.2			165.4	0.30	525	204.1	0.94	1.04	81%	
JONES ROAD	SJ04A003	SJ04A004		49.07					7670	19.20		40.40	125		2400	3956	53.7	11626	3.06	148.3			202.0	0.25	600	266.1	0.94	1.03	76%
JONES ROAD	SJ04A004	SJ04A005		49.07					7670			40.40			3956	53.7	11626	3.06	148.3			202.0	0.25	600	266.1	0.94	1.03	76%	
JONES ROAD	SJ04A005	SJ04A018	0.20	49.27					7670			40.40			3956	53.8	11626	3.06	148.3			202.1	0.25	600	266.1	0.94	1.03	76%	
PRIVATE ROAD	SJ04A017	SJ04A018								4.20		4.20	125		525	525	2.5	525	5.00	10.9			13.5	0.50	375	107.4	0.97	0.67	13%
JONES ROAD	SJ04A018	SJ03A002		49.27					7670	5.50		50.10	125		688	5169	59.6	12839	3.00	160.5			220.2	0.25	600	266.1	0.94	1.04	83%
JONES ROAD	SJ03A002	SJ03A003		49.27					7670			50.10			5169	59.6	12839	3.00	160.5			220.2	0.25	600	266.1	0.94	1.04	83%	
JONES ROAD	SJ03A003	SJ03A004		49.27					7670	6.70		56.80	125		838	6007	63.6	13677	2.96	168.9			232.5	0.25	600	266.1	0.94	1.04	87%
S. SERVICE ROAD	SJ03A004	SJ03A005		49.27					7670			56.80			6007	63.6	13677	2.96	168.9			232.5	0.25	600	266.1	0.94	1.04	87%	

SANITARY SEWER DESIGN SHEET

FRUITLAND -WINONA SECONDARY PLAN AREA-BLOCK 1

INCLUDING GREENBELT LANDS

City of Hamilton

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Project No: 20-263
Date: 25-Apr-24
Designed by: E.L.
Checked by: S.H.

DESIGN CRITERIA				
Min Diameter =	250	mm	Avg. Domestic Flow =	360.0 l/c/d
Mannings 'n' =	0.015		Infiltration =	0.600 l/s/ha
Min. Velocity =	0.75	m/s	Max. Peaking Factor =	5.00
Max. Velocity =	2.75	m/s	Min. Peaking Factor =	2.00
				$M = \frac{5}{P^{0.2}}$
Factor of Safety =	25	%		
				Denotes overcapacity sewer
NOMINAL PIPE SIZE USED				

STREET	FROM MH	TO MH	RESIDENTIAL							COMMERCIAL/INDUSTRIAL/INSTITUTIONAL/MIXED USE							FLOW CALCULATIONS							PIPE DATA					
			AREA (ha)	ACC. AREA (ha)	UNITS (#)	DENISTY (P/ha)	DENSITY (P/unit)	POP	ACCUM. RES. POP.	AREA (ha)	AREA ID	ACC. AREA (ha)	EQUIV. POP. (p/ha)	FLOW RATE (l/s/ha)	EQUIV. POP.	ACCUM. EQUIV. POP.	INFILTRATION (l/s)	TOTAL ACCUM. POP.	PEAKING FACTOR	RES. FLOW (l/s)	COMM. FLOW (l/s)	ACCUM. COMM. FLOW (l/s)	TOTAL FLOW (l/s)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (l/s)	FULL FLOW VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	PERCENT FULL (%)
FRUITLAND SEWERSHED																													
EXTERNAL AREA 1	EXT1	SI07A014	7.70	7.70		75		578	578		EXT1						4.6	578	5.00	12.0			16.7	0.50	250	36.4	0.74	0.71	46%
REGALVIEW DRIVE	SI07A012	SI07A014	11.30	11.30		60		678	678								6.8	678	5.00	14.1			20.9	1.16	300	90.3	1.28	1.01	23%
REGALVIEW DRIVE	SI07A014	SI07A015	1.50	20.50		60		90	1346								12.3	1346	4.71	26.4			38.7	1.13	300	89.1	1.26	1.17	43%
HIGHWAY 8	SI07A039	SI07A015								2.60		2.60	40		105	105	1.6	105	5.00	2.2			3.7	0.40	250	32.6	0.66	0.44	11%
HIHGWAY 8	FUTURE 2	SI07A015								1.90	SW8, EX	1.90	68		130	130	1.1	130	5.00	2.7			3.8	0.40	250	32.6	0.66	0.44	12%
FRUITLAND ROAD	SI07A015	SI06A001		20.50					1346	1.70	F4, EX	6.20	48		81	316	16.0	1662	4.52	31.3			47.3	0.40	375	96.1	0.87	0.84	49%
FRUITLAND ROAD	SI06A001	SI06A002	1.60	22.10		65		104	1450		F3.5, EX	6.20			316	17.0	1766	4.46	32.8			49.8	0.40	375	96.1	0.87	0.86	52%	
FRUITLAND ROAD	SI06A002	SI06A003	0.80	22.90		65		52	1502		F3.4, EX	6.20			316	17.5	1818	4.44	33.6			51.1	0.40	375	96.1	0.87	0.86	53%	
FRUITLAND ROAD	SI06A003	SI06A005	1.30	24.20		66.1538		86	1588		F3.3, EX	6.20			316	18.2	1904	4.40	34.9			53.1	0.40	375	96.1	0.87	0.88	55%	
FRUITLAND ROAD	SI06A005	SI06A007	0.80	25.00		57.5		46	1634		F3.2, EX	6.20			316	18.7	1950	4.37	35.5			54.3	0.40	375	96.1	0.87	0.88	56%	
FRUITLAND ROAD	SI06A007	SI06A009	0.80	25.80		63.75		51	1685		F3.1, EX	6.20			316	19.2	2001	4.35	36.3			55.5	0.40	375	96.1	0.87	0.88	58%	
SHERWOOD PARK ROAD	SI06A014	SI06A013								7.90		7.90	12		95	95	4.7	95	5.00	2.0			6.7	0.40	250	32.6	0.66	0.51	21%
SHERWOOD PARK ROAD	SI06A013	SI06A012	0.30	0.30		60		18	18			7.90			95	95	4.9	113	5.00	2.4			7.3	0.40	250	32.6	0.66	0.52	22%
SHERWOOD PARK ROAD	SI06A012	SI06A009		0.30					18			7.90			95	95	4.9	113	5.00	2.4			7.3	0.40	250	32.6	0.66	0.52	22%
STREET B	FUTURE 4	SI06A009	0.20	0.20							F2.4						0.1						0.1	0.50	250	36.4	0.74	0.19	0%
FRUITLAND ROAD	SI06A009	SI05A023	0.70	27.00		64.2857		45	1748		F2.4, EX	14.10			411	24.7	2159	4.29	38.6			63.2	0.40	450	156.3	0.98	0.91	40%	
FRUITLAND ROAD	SI05A023	SI05A013	1.10	28.10		61.8182		68	1816		F2.3, EX	14.10			411	25.3	2227	4.26	39.5			64.9	0.40	450	156.3	0.98	0.91	41%	
FRUITLAND ROAD	SI05A013	SI05A012	0.80	28.90		63.75		51	1867		F2.2, EX	14.10			411	25.8	2278	4.24	40.3			66.1	0.40	450	156.3	0.98	0.91	42%	
FRUITLAND ROAD	SI05A012	SI05A010	0.60	29.50		65		39	1906		F2.1, EX	14.10			411	26.2	2317	4.23	40.8			67.0	0.40	450	156.3	0.98	0.91	43%	
SANDY DRIVE	SI05A021	SI05A010	6.70	6.70		60		402	402								4.0	402	5.00	8.4			12.4	0.60	250	39.9	0.81	0.71	31%
FRUITLAND ROAD	SI05A010	SI05A008	0.60	36.80		73.3333		44	2352		F1, EX	14.10			411	30.5	2763	4.08	47.0			77.5	0.40	450	156.3	0.98	0.97	50%	
FRUITLAND ROAD	SI05A008	SI05A006		36.80					2352	1.20		15.30	94		113	524	31.3	2876	4.05	48.5			79.8	0.40	450	156.3	0.98	0.97	51%
BARTON STREET	SI05A007	SI05A006								11.50		11.50	102		1177	1177	6.9	1177	4.84	23.7			30.6	0.40	375	96.1	0.87	0.76	32%
BARTON STREET	SI05A015	SI05A016	1.70	1.70		198.235		337	337		B3.3, EX						1.0	337	5.00	7.0			8.0	0.35	300	49.6	0.70	0.51	16%
BARTON STREET	SI05A016	MH12A	1.70	3.40		175.882		299	636		B3.4, EX						2.0	636	5.00	13.3			15.3	0.35	300	49.6	0.70	0.61	31%
EXTERNAL AREA 2	EXT2	MH1A	21.60	21.60		110		2376	2376		EXT2						13.0	2376	4.21	41.6			54.6	0.50	375	107.4	0.97	0.96	51%
BLOCK 1 SEWERSHED																													
GORDON DEAN AVE	MH1A	MH2A	2.70	24.30		88.8889		240	2616		SW9, SW10, & SE6						14.6	2616	4.13	45.0			59.5	1.25	375	169.9	1.54	1.38	35%
GORDON DEAN AVE	MH2A	MH3A	5.90	30.20		178.814		1055	3671		SW6 & SW7						18.1	3671	3.85	59.0			77.1	1.25	375	169.9	1.54	1.48	45%
GORDON DEAN AVE	MH3A	MH9A	6.80	37.00		176.471		1200	4871		SW2, RD1						22.2	4871	3.64	73.9			96.1	1.00	375	152.0	1.38	1.42	63%
STREET B	MH5A	MH6A	1.80	1.80		110		198	198		NW2 & SW1						1.1	198	5.00	4.1			5.2	0.50	250	36.4	0.74	0.52	14%
STREET B	MH6A	MH9A	10.10	11.90		65.7426		664	862		SW3.1, SW3-5, RD2						7.1	862	5.00	18.0			25.1	0.50	250	36.4	0.74	0.78	69%
STREET B	MH7A	MH8A	3.60	3.60		85.5556		308	308		SE2.1, SE3						2.2	308	5.00	6.4			8.6	1.00	250	51.5	1.05	0.78	17%
STREET B	MH8A	MH9A	2.75	6.35		186.545		513	821		SE1, RD3						3.8	821	5.00	17.1			20.9	0.50	250	36.4	0.74	0.75	57%
GORDON DEAN AVE	MH9A	MH10A	10.55	65.80		88.0569		929	7483		NW4 & NE1						39.5	7483	3.34	104.2			143.7	0.50	525	263.6	1.22	1.23	55%
GORDON DEAN AVE	MH10A	MH11A	6.70	72.50		83.8806		562	8045		NW1 & NW3						43.5	8045	3.30	110.5			154.0	1.00	525	372.7	1.72	1.60	41%
GORDON DEAN AVE	MH11A	MH12A	1.70	74.20					8045		RD4						44.5	8045	3.30	110.5			155.0	1.00	525	372.7	1.72	1.60	42%
BARTON STREET	MH12A	MH13A	0.60	78.20		60		36	8717								46.9	8717	3.24	117.8			164.7	0.50	525	263.6	1.22	1.25	62%
BARTON STREET	MH13A	SI05A021	0.60	78.80		60		36	8753								47.3	8753	3.24	118.2			165.4	0.35	525	220.5	1.02	1.11	75%
BARTON STREET	SI05A021	SI05A001	0.80	79.60		60		48	8801								47.8	8801	3.24	118.7			166.4	0.35	525	220.5	1.02	1.11	75%
BARTON STREET	SI05A001	SI05A002	2.00	81.60		146		292	9093		B2, EX						49.0	9093	3.22	121.8			170.8	0.35	525	220.5	1.02	1.11	77%
BARTON STREET																													

SANITARY SEWER DESIGN SHEET

FRUITLAND -WINONA SECONDARY PLAN AREA-BLOCK 1

INCLUDING GREENBELT LANDS

City of Hamilton

PROJECT DETAILS
Project No: 20-263
Date: 25-Apr-24
Designed by: E.L.
Checked by: S.H.

DESIGN CRITERIA				
Min Diameter =	250	mm	Avg. Domestic Flow =	360.0 l/c/d
Mannings 'n' =	0.015		Infiltration =	0.600 l/s/ha
Min. Velocity =	0.75	m/s	Max. Peaking Factor =	5.00
Max. Velocity =	2.75	m/s	Min. Peaking Factor =	2.00
				$M = \frac{5}{P^{0.2}}$
Factor of Safety =	25	%		
				Denotes overcapacity sewer
NOMINAL PIPE SIZE USED				

STREET	FROM MH	TO MH	RESIDENTIAL							COMMERCIAL/INDUSTRIAL/INSTITUTIONAL/MIXED USE							FLOW CALCULATIONS							PIPE DATA					
			AREA (ha)	ACC. AREA (ha)	UNITS (#)	DENISTY (P/ha)	DENSITY (P/unit)	POP	ACCUM. RES. POP.	AREA (ha)	AREA ID	ACC. AREA (ha)	EQUIV. POP. (p/ha)	FLOW RATE (l/s/ha)	EQUIV. POP.	ACCUM. EQUIV. POP.	INFILTRATION (l/s)	TOTAL ACCUM. POP.	PEAKING FACTOR	RES. FLOW (l/s)	COMM. FLOW (l/s)	ACCUM. COMM. FLOW (l/s)	TOTAL FLOW (l/s)	SLOPE (%)	PIPE DIAMETER (mm)	FULL FLOW CAPACITY (l/s)	FULL FLOW VELOCITY (m/s)	ACTUAL VELOCITY (m/s)	PERCENT FULL (%)
ARVIN AVENUE	SI04A006	SI04A008	27.40	27.40		125		3425	3425								16.4	3425	3.91	55.8			72.2	0.35	450	146.2	0.92	0.88	49%
ARVIN AVENUE	SI04A007	SI04A008	13.80	13.80		125		1725	1725								8.3	1725	4.48	32.2			40.5	0.60	375	117.7	1.07	0.93	34%
FRUITLAND ROAD	SI04A008	SI04A011	0.40	170.60		125		50	17836			28.40			1851	119.4	19687	2.76	226.0			345.4	0.75	600	460.8	1.63	1.78	75%	
FRUITLAND ROAD	SI04A011	SI04A014	0.50	171.10		125		63	17899			28.40			1851	119.7	19750	2.75	226.6			346.3	0.75	600	460.8	1.63	1.78	75%	
FRUITLAND ROAD	SI04A014	SI03A004	1.90	173.00		125		238	18137			28.40			1851	120.8	19988	2.75	228.8			349.6	0.40	675	460.8	1.29	1.40	76%	
S. SERVICE ROAD	SI03A004	SI03A003		173.00					18137			28.40			1851	120.8	19988	2.75	228.8			349.6	0.40	675	460.8	1.29	1.40	76%	
JONES ROAD SEWERSHED																													
HIGHWAY 8	EXISTING	SJ06A001	17.10	17.10		110		1881	1881	2.70	EXT3, EXT3.1	2.70	125	338	338	11.9	2219	4.26	39.4			51.3	0.50	375	107.4	0.97	0.93	48%	
JONES ROAD	EXISTING	SJ06A001								6.60	SE4, SE7	6.60	7	45	45	4.0	45	5.00	0.9			4.9	0.50	250	36.4	0.74	0.51	13%	
JONES ROAD	SJ06A001	SJ06A002		17.10					1881	2.20	J5.1, SE5.1, EX	11.50	114	250	633	17.2	2514	4.16	43.6			60.7	0.50	375	107.4	0.97	0.98	57%	
JONES ROAD	SJ06A002	SJ06A003		17.10					1881	2.70	J5.2, SE5.2, EX	14.20	111	300	933	18.8	2814	4.07	47.7			66.4	0.50	375	107.4	0.97	1.00	62%	
JONES ROAD	SJ06A003	SJ06A004	3.00	20.10		141		423	2304		J4.1, SE2.2	14.20			933	20.6	3237	3.95	53.3			73.9	0.50	375	107.4	0.97	1.02	69%	
JONES ROAD	SJ06A004	SJ06A005	1.10	21.20		159.091		175	2479		J4.2, EX	14.20			933	21.2	3412	3.91	55.6			76.9	1.90	375	209.5	1.90	1.71	37%	
JONES ROAD	SJ06A005	SJ06A005	3.40	24.60		122.059		415	2894		J3.2, NE3, EX	14.20			933	23.3	3827	3.82	61.0			84.2	1.00	375	152.0	1.38	1.39	55%	
JONES ROAD	SJ05A005	SJ05A006	1.20	25.80		187.5		225	3119		J3.1, EX	14.20			933	24.0	4052	3.78	63.8			87.8	0.70	450	206.7	1.30	1.21	42%	
JONES ROAD	SJ05A006	SJ05A007	2.80	28.60		223.214		625	3744		J1, NE2, EX	14.20			933	25.7	4677	3.67	71.6			97.3	0.50	450	174.7	1.10	1.11	56%	
JONES ROAD	SJ05A007	SJ05A008	2.70	31.30		64.8148		175	3919		J0, B3.1, EX	14.20			933	27.3	4852	3.65	73.7			101.0	0.50	450	174.7	1.10	1.11	58%	
BARTON STREET	SJ05A012	SJ05A011	0.60	0.60		60		36	36								0.4	36	5.00	0.8			1.1	0.40	300	53.0	0.75	0.26	2%
BARTON STREET	SJ05A011	SJ05A010	1.65	2.25		184.24		304	340		B3.2, EX						1.4	340	5.00	7.1			8.4	0.40	300	53.0	0.75	0.55	16%
BARTON STREET	SJ05A010	SJ05A008		2.25					340								1.4	340	5.00	7.1			8.4	0.40	300	53.0	0.75	0.55	16%
BLOCK 2 EXTERNAL	EXTERNAL	BLOCK 2	24.20	24.20		120		2904	2904		EXT4						14.5	2904	4.04	48.9			63.4	0.50	375	107.4	0.97	0.98	59%
BLOCK 2	BLOCK 2	SJ05A002	32.67	56.87		161.329		5271	8175		BLK2						34.1	8175	3.28	111.9			146.0	0.30	450	135.3	0.85	0.97	108%
BARTON STREET	SJ05A002	SJ05A003		56.87					8175								34.1	8175	3.28	111.9			146.0	0.30	450	135.3	0.85	0.97	108%
BARTON STREET	SJ05A003	SJ05A008		56.87					8175								34.1	8175	3.28	111.9			146.0	0.30	450	135.3	0.85	0.97	108%
JONES ROAD	SJ05A008	SJ05A009		90.42					12434	0.80		15.00	60	48	981	63.3	13415	2.97	166.3			229.5	0.30	600	291.5	1.03	1.12	79%	
JONES ROAD	SJ05A009	SJ04A001		90.42					12434	4.00		19.00	75	300	1281	65.7	13715	2.96	169.2			234.9	0.30	600	291.5	1.03	1.13	81%	
JONES ROAD	SJ04A001	SJ04A002		90.42					12434	4.90		23.90	125	613	1894	68.6	14328	2.94	175.3			243.9	0.30	525	204.1	0.94	1.08	119%	
JONES ROAD	SJ04A002	SJ04A003		90.42					12434			23.90			1894	68.6	14328	2.94	175.3			243.9	0.30	525	204.1	0.94	1.08	119%	
JONES ROAD	SJ04A003	SJ04A004		90.42					12434	19.20		43.10	125	2400	4294	80.1	16728	2.85	198.4			278.5	0.25	600	266.1	0.94	1.07	105%	
JONES ROAD	SJ04A004	SJ04A005		90.42					12434			43.10			4294	80.1	16728	2.85	198.4			278.5	0.25	600	266.1	0.94	1.07	105%	
JONES ROAD	SJ04A005	SJ04A018	0.20	90.62					12434			43.10			4294	80.2	16728	2.85	198.4			278.6	0.25	600	266.1	0.94	1.07	105%	
PRIVATE ROAD	SJ04A017	SJ04A018								4.20		4.20	125	525	525	2.5	525	5.00	10.9			13.5	0.50	375	107.4	0.97	0.67	13%	
JONES ROAD	SJ04A018	SJ03A002		90.62					12434	5.50		52.80	125	688	5507	86.1	17941	2.81	209.8			295.9	0.25	600	266.1	0.94	1.07	111%	
JONES ROAD	SJ03A002	SJ03A003		90.62					12434			52.80			5507	86.1	17941	2.81	209.8			295.9	0.25	600	266.1	0.94	1.07	111%	
JONES ROAD	SJ03A003	SJ03A004		90.62					12434	6.70		59.50	125	838	6345	90.1	18779	2.78	217.6			307.7	0.25	600	266.1	0.94	1.07	116%	
S. SERVICE ROAD	SJ03A004	SJ03A005		90.62					12434			59.50			6345	90.1	18779	2.78	217.6			307.7	0.25	600	266.1	0.94	1.07	116%	