Appendix I

Wastewater Model

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ENGINEERS · ARCHITECTS · PLANNERS

VILLAGE OF CASSELMAN: SANITARY SEWER AND WATER MASTER PLAN
JLR No. 16953-119

Future Sanitary Sewer System - September 2023 (Existing Conditions)

SANITARY SEWER DESIGN SHEET

Design Constants/Coefficients

Manning's "n" =	0.013	
Infilt. Allowance =	0.28	L/s/ha
Residential Flow =	350	L/cap/d
Commercial/Institutional Flow Rate =	28000	L/gross ha/d
Industrial Flow Rate =	35000	L/gross ha/d

Unless otherwise indicated, Manning's 'n' is assumed to be 0.013

Population Data (Existing)

Total Number of Units:	1695
Census Existing Population:	4048
Population Calibration Factor:	0.791
Computed Population:	4048
Harmon Equation Correction Factor:	1.0
Weighted Coefficients	
Singles & Semi-Detached:	2.62
Multiple Dwellings:	2.04
Apartments:	1.42
ICI peaking factor:	1.50
PPU:	2.39

Population Data (New Subdivision)

Single Family:	3.4	persons/unit
Townhouse:	2.7	persons/unit
Semi-detached:	2.70	persons/unit
Apartments:	1.80	persons/unit
Duplex:	2.30	persons/unit
Res. Flow:	350	L/cap/d
Infilt. Allowance:	0.28	L/ha/s

🟧	Downstream Runs
🟩	If population changes, please change value in this cell

Prepared by: M.L.
Checked by: B.P.

STREET	MANHOLE NUMBER		FROM MH - TO MH	SANITARY CONTRIBUTION																																																			
				EXISTING RESIDENTIAL AREA										FUTURE RESIDENTIAL					EXISTING ICI						FUTURE ICI							EXISTING EXTRANEOUS			FUTURE EXTRANEOUS									SEWER DATA											
				Census Data															Areas (ha)		Flows (l/s)				Areas (ha)		Flows (l/s)																												
	FROM	TO		Singles & Semis (units)	Multiple Dwellings (units)	Apart (units)	Vacant	Popul. (peop.)	Metered Residential	Cumm. Popul. (peop.)	Cumm. Metered Residential (L/s)	Peaking Factor	Avg. Flow (l/s)	Popul. (peop.)	Cumm. Popul. (peop.)	Peaking Factor	Avg. Flow	Peak Res. Flow (l/s)	Commerc.	Industrial	mmerc./I	Industria	Peaking Factor	ICI Flow (l/s)	Commerc.	Industrial	Commerc.	Industria	Peaking Factor	ICI Flow (l/s)	Cumm. Peak ICI Flow (l/s)	Area (Ha)	Peak Extr Flow (l/s)	Cumm. Peak Extr. Flow (l/s)	Area (Ha)	Peak Extr. Flow (l/s)	Cumm. Peak Extr. Flow (l/s)	Pump Flow (l/s)	Total Peak Des. Flow (l/s)	Pump Correction Facto (l/s)	Total Peak Des. Flow with pump (l/s)	Q_d/Q_{full} %	Residual Capacity (l/s)	DIA. (mm)	Actual Dia. (mm)	DESIGN SLOPE (%)	ACTUAL SLOPE (%)	CAPAC. (l/s)	VEL. (m/s)	LENGTH (m)	Upstream Obvert (m)	Upstream Invert (m)	Downstream Obvert (m)	Downstream (m)	Comments
RACINE	1210	1205	1210-1205							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	5.98	0.00	2.42	1.50	3.634					1.500	0.000	3.634	5.98	1.674	1.674		0.000	0.000		5.308		5.308	24.67	16.207	200	203.20	0.400	0.395	21.515	0.663	50.58	62.94	62.744	62.75	62.544	
	1205	1200	1205-1200							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	3.634	0.00	0.000	1.674		0.000	0.000		5.308		5.308	24.80	16.100	200	203.20	0.388	0.391	21.408	0.660	40.62	62.43	62.232	62.28	62.073	
	1200	1195	1200-1195							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	3.634	0.00	0.000	1.674		0.000	0.000		5.308		5.308	21.33	19.578	200	203.20	0.525	0.529	24.887	0.767	39.70	62.27	62.073	62.07	61.863	
	1195	1190	1195-1190							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	3.634	0.00	0.000	1.674		0.000	0.000		5.308		5.308	16.19	27.482	250	254.00	0.279	0.279	32.790	0.647	82.33	62.10	61.846	61.87	61.616	
	1190	1185	1190-1185							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	5.37	0.00	2.18	1.50	3.264					1.500	0.000	6.898	5.37	1.504	3.179		0.000	0.000		10.077		10.077	26.31	28.221	250	254.00	0.381	0.381	38.298	0.756	50.64	61.52	61.271	61.33	61.078	
	1185	1170	1185-1170							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	6.898	0.00	0.000	3.179		0.000	0.000		10.077		10.077	26.73	27.616	250	254.00	0.376	0.369	37.693	0.744	62.85	61.33	61.078	61.10	60.846	
RACINE	1180	1175	1180-1175							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	1.45	0.00	0.59	1.50	0.881					1.500	0.000	0.881	1.45	0.406	0.406		0.000	0.000		1.287		1.287	5.76	21.044	200	203.20	0.412	0.426	22.331	0.689	43.67	62.99	62.792	62.81	62.606	
	1175	1170	1175-1170							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.881	0.00	0.000	0.406		0.000	0.000		1.287		1.287	5.84	20.736	200	203.20	0.420	0.414	22.023	0.679	40.55	62.80	62.596	62.63	62.428	
INDUSTRIEL	1170	1165	1170-1165							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	7.779	0.00	0.000	3.585		0.000	0.000		11.364		11.364	39.86	17.147	250	254.00	0.216	0.211	28.511	0.563	77.18	61.10	60.846	60.94	60.683	
	1165	1150	1165-1150							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	7.779	0.00	0.000	3.585		0.000	0.000		11.364		11.364	39.60	17.334	250	254.00	0.213	0.214	28.698	0.566	64.49	60.92	60.671	60.79	60.533	
INDUSTRIEL	1160	1155	1160-1155							0.0		4.00	0.00		0.0	4.00	0.00	0.00	1.34	1.81	0.44	0.73	1.50	1.753					1.500	0.000	1.753	3.15	0.883	0.883		0.000	0.000		2.636		2.636	10.43	22.625	200	203.20	0.759	0.545	25.261	0.779	63.67	63.80	63.600	63.46	63.253	Not As-built
	1155	1150	1155-1150							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.753	0.00	0.000	0.883		0.000	0.000		2.636		2.636	5.77	43.011	200	203.20	1.546	1.780	45.647	1.408	81.64	63.45	63.253	62.00	61.800	Not As-built
INDUSTRIEL	1150	PS3	1150-PS3							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	9.532	0.00	0.000	4.468		0.000	0.000		14.000		14.000	43.54	18.157	250	254.00	0.300	0.269	32.157	0.635	20.47	60.78	60.533	60.73	60.478	U/S invert has been assumed. D/S invert has been computed from length and slope.
INDUSTRIEL	PS3	1125	PS3-1125							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	9.532	0.00	0.000	4.468		0.000	0.000	37.000	14.000	23.000	37.000	0.00		150	152.40	0.000	0.044	0.000	0.182	348.51	60.63	60.478	60.48	60.326	**Forcemain**
INDUSTRIEL	1145	1140	1145-1140							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.56	0.99	0.18	0.40	1.50	0.872					1.500	0.000	0.872	1.55	0.433	0.433		0.000	0.000		1.305		1.305	5.37	23.024	200	203.20	0.500	0.506	24.329	0.750	52.02	65.01	64.808	64.75	64.545	U/S invert has been assumed. D/S invert has been computed from length and slope.
INDUSTRIEL	1140	1135	1140-1135							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.872	0.00	0.000	0.433		0.000	0.000		1.305		1.305	5.48	22.493	200	203.20	0.500	0.484	23.799	0.734	44.44	64.72	64.515	64.50	64.300	U/S invert has been assumed. D/S invert has been computed from length and slope.
INDUSTRIEL	1135	1130	1135-1130							0.0		4.00	0.00		0.0	4.00	0.00	0.00	4.12	0.00	1.34	0.00	1.50	2.005					1.500	0.000	2.877	4.12	1.155	1.588		0.000	0.000		4.465		4.465	18.77	19.327	200	203.20	0.500	0.483	23.792	0.734	108.58	64.48	64.275	63.95	63.750	U/S invert has been assumed. D/S invert has been computed from length and slope.
	1130	1125	1130-1125							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	2.877	0.00	0.000	1.588		0.000	0.000		4.465		4.465	18.45	19.734	200	203.20	0.501	0.500	24.200	0.746	52.58	65.01	64.808	64.75	64.545	
RACINE	1125	1095	1125-1095							0.0		4.00	0.00		0.0	4.00	0.00	0.00	1.63	0.00	0.53	0.00	1.50	0.794					1.500	0.000	13.203	1.63	0.457	6.513		0.000	0.000		19.717	23.000	42.717	63.38	24.680	300	304.80	0.450	0.446	67.397	0.924	113.37	63.68	63.384	63.18	62.878	D/S obvert is lower than outbound invert.
RICHER	1120	1115	1120-1115							0.0		4.00	0.00		0.0	4.00	0.00	0.00	2.24	0.00	0.73	0.00	1.50	1.090					1.500	0.000	1.090	2.24	0.628	0.628		0.000	0.000		1.718		1.718	4.91	33.250	250	254.00	0.280	0.318	34.968	0.690	31.48	64.22	63.970	64.12	63.870	
	1115	1110	1115-1110							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.090	0.00	0.000	0.628		0.000	0.000		1.718		1.718	5.27	30.872	250	254.00	0.277	0.276	32.589	0.643	126.47	64.12	63.870	63.78	63.521	
LAFLECHE	1110	1105	1110-1105							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.73	0.00	0.24	0.00	1.50	0.356					1.500	0.000	1.446	0.73	0.205	0.833		0.000	0.000		2.279		2.279	6.90	30.770	250	254.00	0.276	0.284	33.050	0.652	95.14	63.75	63.500	63.48	63.230	
	1105	1100	1105-1100							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.446	0.00	0.000	0.833		0.000	0.000		2.279		2.279	2.56	86.903	350	355.60	0.250	0.343	89.183	0.898	29.11	63.58	63.230	63.49	63.130	No as-built lengths due to inconsistencies b/w as-builts (JLR 11375-1 and JLR 80-6319-1)
	SOUTH417	1100	SOUTH417-110							0.0		4.00	0.00		0.0	4.00	0.00	0.00	1.84	0.00	0.60	0.00	1.50	0.893					1.500	0.000	0.893	1.84	0.515	0.515		0.000	0.000		1.408		1.408	4.58	29.345	200	203.20	0.800	0.808	30.752	0.948	84.18	63.76	63.555	63.08	62.875	No as-built lengths due to inconsistencies b/w as-builts (JLR 11375-1 and JLR 80-6319-1)
PRINCIPALE	1100	1095	1100-1095							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	2.340	0.00	0.000	1.348		0.000	0.000		3.687		3.687	6.29	54.908	350	355.60	0.151	0.148	58.595	0.590	26.30	63.43	63.084	63.40	63.045	
PRINCIPALE	1095	1090	1095-1090							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	15.543	0.00	0.000	7.861		0.000	0.000		23.404	23.000	46.404	72.47	17.627	350	355.60	0.177	0.177	64.031	0.645	87.54	63.35	62.999	63.20	62.844	
PRINCIPALE	244	1090	244-1090							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	90.027	350	355.60	0.000	0.350	90.027	0.906	131.38	63.65	63.304	63.20	62.844	
	1090	1085	1090-1085	2.25				5.89		5.9		4.00	0.02		0.0	4.00	0.00	0.10	3.03	0.00	0.98	0.00	1.50	1.473					1.500	0.000	17.016	3.03	0.849	8.709		0.000	0.000		25.821	23.000	48.821	77.86	13.880	350	355.60	0.169	0.170	62.701	0.631	75.39	63.19	62.844	63.07	62.716	
	1085	1080	1085-1080							5.9		4.00	0.02		0.0	4.00	0.00	0.10	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	17.016	0.00	0.000	8.709		0.000	0.000		25.821	23.000	48.821	67.66	23.338	350	355.60	0.225	0.225	72.159	0.727	89.39	63.02	62.670	62.82	62.469	
	1080	1070	1080-1070							5.9		4.00	0.02		0.0	4.00	0.00	0.10	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	17.016	0.00	0.000	8.709		0.000	0.000		25.821	23.000	48.821	76.23	15.225	350	355.60	0.178	0.177	64.047	0.645	75.65	62.80	62.447	62.67	62.313	
PRINCIPALE	1075	1070	1075-1070							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	3.52	0.00	1.43	1.50	2.139					1.500	0.000	2.139	3.52	0.985	0.985		0.000	0.000		3.124		3.124	22.27	10.906	200	203.20	0.400	0.168	14.030	0.433	41.63	63.15	62.950	63.08	62.880	
JEANNE MANCE	1070	1045	1070-1045	2.25		3.44		10.79		16.7		4.00	0.07		0.0	4.00	0.00	0.27	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	19.155	0.45	0.125	9.820		0.000	0.000		29.245	23.000	52.245	75.74	16.731	350	355.60	0.207	0.205	68.976	0.695	116.81	62.61	62.261	62.38	62.021	
JEANNE MANCE	1050	1045	1050-1045	4.50				11.79		11.8		4.00	0.05		0.0	4.00	0.00	0.19	0.53	0.00	0.17	0.00	1.50	0.258					1.500	0.000	0.258	0.53	0.148	0.148		0.000	0.000		0.597		0.597	1.81	32.347	200	203.20	0.930	0.927	32.944	1.016	71.41	62.98	62.783	62.32	62.121	
ST. JOSEPH (SOUTH)	1065	1060	1065-1060	15.76	16.00			73.90		73.9		4.00	0.30		0.0	4.00	0.00	1.20	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.89	0.530	0.530		0.000	0.000		1.728		1.728	7.82	20.370	200	203.20	0.418	0.417	22.098	0.681	65.21	63.87	63.670	63.60	63.398	
	1060	1055	1060-1055							73.9		4.00	0.30		0.0	4.00	0.00	1.20	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.530		0.000	0.000		1.728		1.728	8.55	18.487	200	203.20	0.396	0.349	20.215	0.623	25.21	63.53	63.328	63.44	63.240	Do not have as-built info for this run
	1055	1045	1055-1045							73.9		4.00	0.30		0.0	4.00	0.00	1.20	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.530		0.000	0.000		1.728		1.728	8.11	19.580	200	203.20	0.387	0.388	21.308	0.657	75.55	63.44	63.240	63.15	62.947	
ST. JOSEPH (SOUTH)	1045	1040	1045-1040	10.13				26.52		128.9		4.00	0.52		0.0	4.00	0.00	2.09	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	19.412	1.12	0.314	10.812		0.000	0.000		32.313	23.000	55.314	38.63	87.875	450	457.20	0.231	0.232	143.188	0.872	82.85	62.42	61.969	62.23	61.777	
	1040	1015	1040-1015							128.9		4.00	0.52		0.0	4.00	0.00	2.09	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	19.412	0.00	0.000	10.812		0.000	0.000		32.313	23.000	55.314	39.92	83.239	450	457.20	0.219	0.217	138.553	0.844	76.04	62.23	61.777	62.07	61.612	
DUHAMEL	1020	1015	1020-1015	4.50				11.79		11.8		4.00	0.05		0.0	4.00	0.00	0.19	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.68	0.190	0.190		0.000	0.000		0.381		0.381	1.76	21.230	200	203.20	0.400	0.399	21.611	0.666	70.94	62.56	62.364	62.28	62.081	Missing invert info from as-builts for MHs 925 and 920
PRINCIPALE	1030	1025	1030-1025	3.38		1.72		11.29		11.3		4.00	0.05		0.0	4.00	0.00	0.18	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.48	0.135	0.135		0.000	0.000		0.318		0.318	1.51	20.728	200	203.20	0.383	0.378	21.046	0.649	81.41	62.94	62.743	62.64	62.435	
PRINCIPALE	1035	1025	1035-1025	9.01				23.57		23.6		4.00	0.10		0.0	4.00	0.00	0.38	1.67	0.00	0.54	0.00	1.50	0.810					1.500	0.000	0.810	1.67	0.467	0.467		0.000	0.000		1.659		1.659	8.02	19.027	200	203.20	0.364	0.365	20.686	0.638	90.84	63.18	62.984	62.86	62.652	
DUHAMEL	1025	1015	1025-1015	7.88		0.86		21.85		56.7		4.00	0.23		0.0	4.00	0.00	0.92	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.810	0.62	0.174	0.776		0.000	0.000		2.506		2.506	12.92	16.881	200	203.20	0.318	0.321	19.387	0.598	107.47	62.63	62.426	62.28	62.081	Missing invert info from as-builts ffor MH 920
ST. JOSEPH (SOUTH)	1015	1010	1015-1010	18.01				47.15		244.5		4.00	0.99		0.0	4.00	0.00	3.96	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	20.223	1.18	0.332	12.110		0.000	0.000		36.296	23.000	59.296	42.71	79.544	450	457.20	0.212	0.218	138.840	0.846	85.36	62.06	61.612	61.88	61.426	
	1010	1000	1010-1000							244.5		4.00	0.99		0.0	4.00	0.00	3.96	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	20.223	0.00	0.000	12.110		0.000	0.000		36.296	23.000	59.296	42.72	79.502	450	457.20	0.218	0.218	138.798	0.845	88.63	61.17	60.720	60.98	60.527	
ST. ISIDORE (WEST)	1005	1000	1005-1000		5.33	12.05		28.04		28.0		4.00	0.11		0.0	4.00	0.00	0.45	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.54	0.150	0.150		0.000	0.000		0.604		0.604	2.49	23.630	200	203.20	0.501	0.502	24.235	0.747	35.28	63.18	62.981	63.01	62.804	
ST. ISIDORE (WEST)	1000	520	1000-520							272.6		4.00	1.10		0.0	4.00	0.00	4.42	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	20.223	0.00	0.000	12.260		0.000	0.000		36.900	23.000	59.900	36.65	103.530	450	457.20	0.303	0.302	163.430	0.995	19.87	60.95	60.500	60.90	60.440	Downstream Invert was taken from JLR DWG 68-1130-05, Sewer Rehab.(PLAN & PROFILES)
ST. ISIDORE (WEST)	655	650	655-650	19.14				50.09		50.1		4.00	0.20		0.0	4.00	0.00	0.81	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.72	0.483	0.483		0.000	0.000		1.295		1.295	5.96	20.416	200	203.20	0.400	0.403	21.710	0.669	49.68	63.81	63.610	63.61	63.410	
	650	645	650-645							50.1		4.00	0.20		0.0	4.00	0.00	0.81	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.483		0.000	0.000		1.295		1.295	5.63	21.682	200	203.20	0.450	0.451	22.976	0.709	104.23	63.58	63.380	63.11	62.910	
	645	635	645-635							50.1		4.00	0.20		0.0	4.00	0.00	0.81	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.483		0.000	0.000		1.295		1.295	5.70	21.409	200	203.20	0.443	0.440	22.703	0.700	111.30	63.11	62.910	62.62	62.420	
PERCY	640	635	640-635	7.88				20.63		20.6		4.00	0.08		0.0	4.00	0.00	0.33	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.71	0.200	0.200		0.000	0.000		0.534		0.534	1.51	34.753	250	254.00	0.320	0.324	35.287	0.696	108.19	62.76	62.505	62.41	62.155	
ST. ISIDORE (WEST)	635	630	635-630	11.26		2.58		33.14		103.9		4.00	0.42		0.0	4.00	0.00	1.68	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.52	0.426	1.108		0.000	0.000		2.791		2.791	8.49	30.098	250	254.00	0.283	0.281	32.889	0.649	97.85	62.46	62.213	62.19	61.938	DWGs did not have as-built lengths or slopes. Lengths were scaled from DWGs.
	630	627	630-627							103.9		4.00	0.42		0.0	4.00	0.00	1.68	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	1.108		0.000	0.000		2.791		2.791	8.74	29.159	250	254.00	0.260	0.265	31.950	0.631	69.00	62.19	61.938	62.01	61.755	DWGs did not have as-built lengths or slopes. Lengths were scaled from DWGs.
	2100	2105	2100-2105							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	26.547	200	203.20	0.590	0.602	26.547	0.819	49.01	62.74	62.540	62.45	62.245	
	321	2105	321-2105							0.0		4.00	0.00		0.0	4.00	0.00	0.00	6.36	0.00	2.06	0.00	1.50	3.090					1.500	0.000	3.090	6.36	1.780	1.780		0.000	0.000		4.870		4.870	21.29	18.003	200	203.20	0.400	0.447	22.872	0.705	31.33	62.49	62.290	62.35	62.150	
	2105	2110	2105-2110	27.02				70.72		70.7		4.00	0.29		0.0	4.00	0.00	1.15	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	3.090	2.09	0.585	2.365		0.000	0.000		6.601		6.601	32.42	13.760	200	203.20	0.350	0.354	20.360	0.628	118.62	62.35	62.150	61.93	61.730	
	2110	2115	2110-2115							70.7		4.00	0.29		0.0	4.00	0.00	1.15	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	3.090	0.00	0.000	2.365		0.000	0.000		6.601		6.601	29.32	15.915	200	203.20	0.430	0.433	22.516	0.694	110.85	61.93	61.730	61.45	61.250	
conveyance of overflow	2180	2185	2180-2185							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00		0.000					1.500	0.000	0.000	0.36	0.101	0.101		0.000	0.000		0.101		0.101	0.00							0.000						
	2185	2190	2185-2190	1.13				2.95		2.9		4.00	0.01		0.0	4.00	0.00	0.05	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.101		0.000	0.000		0.148		0.148	0.15	96.140	375	381.00	0.280	0.277	96.288	0.845	57.74	62.50	62.120	62.34	61.960	
	2190	2195	2190-2195	15.76				41.25		44.2		4.00	0.18		0.0	4.00	0.00	0.72	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.13	0.315	0.416		0.000	0.000		1.132		1.132	1.06	105.852	375	381.00	0.340	0.342	106.985	0.938	29.23	62.32	61.940	62.22	61.840	
	2195	2115	2195-2115							44.2		4.00	0.18		0.0	4.00	0.00	0.72	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.416		0.000	0.000		1.132		1.132	1.25	89.124	375	381.00	0.250	0.243	90.256	0.792	102.68	62.19	61.810	61.94	61.560	
	2115	2150	2115-2150	4.50				11.79		126.7		4.00	0.51		0.0	4.00	0.00	2.05	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	3.090	0.28	0.079	2.860		0.000	0.000		8.003		8.003	6.87	108.431	375	381.00	0.400	0.405	116.434	1.021	83.91	61.34	60.960	61.00	60.620	
	2100	2120	2100-2120	7.88				20.63		20.6		4.00	0.08		0.0	4.00	0.00	0.33	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.80	0.225	0.225		0.000	0.000		0.559		0.559	2.17	25.157	200	203.20	0.570	0.565	25.716	0.793	84.98	62.72	62.520	62.24	62.040	
	2120	2125	2120-2125							20.6		4.00	0.08		0.0	4.00	0.00	0.33	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.225		0.000	0.000		0.559		0.559	1.78	30.832	200	203.20	0.800	0.842	31.391	0.968	16.63	62.21	62.010	62.07	61.870	
	2125	2130	2125-2130	22.51				58.93		79.6		4.00	0.32		0.0	4.00	0.00	1.29	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.79	0.502	0.727		0.000	0.000		2.016		2.016	7.26	25.771	200	203.20	0.600	0.660	27.787	0.857	121.30	62.07	61.870	61.27	61.070	
	2130	2135	2130-2135							79.6		4.00	0.32		0.0	4.00	0.00	1.29	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.727		0.000	0.000		2.016		2.016	9.39	19.461	200	203.20	0.400	0.394	21.477	0.662	15.23	61.24	61.040	61.18	60.980	
	2135	2140	2135-2140							79.6		4.00	0.32		0.0	4.00	0.00	1.29	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.727		0.000	0.000		2.016		2.016	9.69	18.788	200	203.20	0.400	0.370	20.804	0.642	45.99	61.17	60.970	61.00	60.800	
	2140	2145	2140-2145							79.6		4.00	0.32		0.0	4.00	0.00	1.29	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.727		0.000	0.000		2.016		2.016	6.37	29.638	200	203.20	0.400	0.856	31.654	0.976	9.35	60.96	60.760	60.88	60.680	
	2145	2150	2145-2150	3.38				8.84		88.4		4.00	0.36		0.0	4.00	0.00	1.43	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.34	0.097	0.824		0.000	0.000		2.256		2.256	10.93	18.392	200	203.20	0.400	0.364	20.648	0.637	76.89	60.85	60.650	60.57	60.370	
	2150	2165	2150-2165	13.51				35.36		250.5		4.00	1.01		0.0	4.00	0.00	4.06	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	3.090	0.67	0.188	3.872		0.000	0.000		11.020		11.020	9.70	102.573	375	381.00	0.380	0.386	113.594	0.996	62.23	60.56	60.180	60.32	59.940	
	2155	2160	2155-2160	16.89				44.20		44.2		4.00	0.18		0.0	4.00	0.00	0.72	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.86	0.240	0.240		0.000	0.000		0.956		0.956	3.56	25.880	200	203.20	0.580	0.615	26.836	0.828	108.92	61.81	61.610	61.14	60.940	
	2200	2160	2200-2160	19.14				50.09		50.1		4.00	0.20		0.0	4.00	0.00	0.81	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.98	0.274	0.274		0.000	0.000		1.085		1.085	3.14	33.491	200	203.20	1.040	1.021	34.576	1.066	89.12	62.11	61.910	61.20	61.000	
	2160	2165	2160-2165	6.75				17.68		112.0		4.00	0.45		0.0	4.00	0.00	1.81	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.39	0.108	0.622		0.000	0.000		2.436		2.436	9.75	22.560	200	203.20	0.590	0.534	24.996	0.771	86.19	61.14	60.940	60.68	60.480	
	2165	2170	2165-2170							362.4		4.00	1.47		0.0	4.00	0.00	5.87	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	3.090	0.00	0.000	4.494		0.000	0.000		13.456		13.456	12.84	91.345	375	381.00	0.260	0.328	104.801	0.919	36.55	60.32	59.940	60.20	59.820	
	2170	PS5	2170-PS5							362.4		4.00	1.47		0.0	4.00	0.00	5.87	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	3.090	0.00	0.000	4.494		0.000	0.000		13.456		13.456	13.80	84.072	300	304.80	1.000	0.935	97.529	1.337	12.84	59.52	59.220	59.40	59.100	
QUARTIER DES BOISE - Area F (Partial)	PS5	2175	PS5-2175							362.4		4.00	1.47		0.0	4.00	0.00	5.87	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	3.090	0.00	0.000	4.494		0.000	0.000	20.500	13.456	7.044	20.500	0.00		200	203.20	0.000	-1.381	0.000	1.240	240.39	59.30	59.100	62.62	62.420	**Forcemain**
	2175	2180	2175-2180	7.88				20.63		383.1		4.00	1.55		0.0	4.00	0.00	6.21	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	3.090	0.82	0.230	4.724		0.000	0.000		14.021	7.044	21.065	35.98	37.487	300	304.80	0.330	0.337	58.552	0.802	92.03	62.72	62.420	62.41	62.110	
	2205	2180	2205-2180	5.63				14.73		14.7		4.00	0.06		0.0	4.00	0.00	0.24	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.71	0.199	0.199		0.000	0.000		0.437		0.437	1.53	28.094	200	203.20	0.690	0.695	28.531	0.880	51.78	62.68	62.480	62.32	62.120	
	2180	627	2180-627							397.8		4.00	1.61		0.0	4.00	0.00	6.45	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	3.090	0.00	0.000	4.923		0.000	0.000		14.458	7.044	21.502	41.21	30.679	300	304.80	0.260	0.268	52.181	0.715	119.61	62.37	62.070	62.05	61.750	
	627	625	627-625	7.88				20.63		522.3		3.96	2.12		0.0	3.96	0.00	8.39	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	3.090	1.19	0.333	6.363		0.000	0.000		17.841	7.044	24.884	79.25	6.514	250	254.00	0.26	0.26	31.399	0.620	29.28	62.01	61.76	61.93	61.68	
	625	620	625-620							522.3		3.96	2.12		0.0	3.96	0.00	8.39	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	3.090	0.00	0.000	6.363		0.000	0.000		17.841	7.044	24.884	74.26	8.627	250	254.00	0.29	0.29	33.511	0.661	113.10	61.93	61.68	61.60	61.35	

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

VILLAGE OF CASSELMAN: SANITARY SEWER AND WATER MASTER PLAN
JLR No. 16953-119

Future Sanitary Sewer System - September 2023 (Existing Conditions)

SANITARY SEWER DESIGN SHEET

Design Constants/Coefficients

Manning's "n" =	0.013	
Infilt. Allowance =	0.28	L/s/ha
Residential Flow =	350	L/cap/d
Commercial/Institutional Flow Rate =	28000	L/gross ha/d
Industrial Flow Rate =	35000	L/gross ha/d

Unless otherwise indicated, Manning's 'n' is assumed to be 0.013

Population Data (Existing)

Total Number of Units:	1695
Census Existing Population:	4048
Population Calibration Factor:	0.791
Computed Population:	4048
Harmon Equation Correction Factor:	1.0
Weighted Coefficients	
Singles & Semi-Detached:	2.62
Multiple Dwellings:	2.04
Apartments:	1.42
ICI peaking factor:	1.50
PPU:	2.39

Population Data (New Subdivision)

Single Family:	3.4	persons/unit
Townhouse:	2.7	persons/unit
Semi-detached:	2.70	persons/unit
Apartments:	1.80	persons/unit
Duplex:	2.30	persons/unit
Res. Flow:	350	L/cap/d
Infilt. Allowance:	0.28	L/ha/s

🟧	Downstream Runs
🟩	If population changes, please change value in this cell

Prepared by: M.L.
Checked by: B.P.

SANITARY CONTRIBUTION

STREET	MANHOLE NUMBER FROM	MANHOLE NUMBER TO	FROM MH - TO MH	EXISTING RESIDENTIAL AREA Census Data Singles & Semis (units)	Census Data Multiple Dwellings (units)	Census Data Apart (units)	Census Data Vacant	Popul. (peop.)	Metered Residential	Cumm. Popul. (peop.)	Cumm. Metered Residential (L/s)	Peaking Factor	Avg. Flow (l/s)	FUTURE RESIDENTIAL Popul. (peop.)	Cumm. Popul. (peop.)	Peaking Factor	Avg. Flow	Peak Res. Flow (l/s)	EXISTING ICI Areas (ha) Commerc.	Areas (ha) Industrial	Flows (l/s) mmerc./I	Flows (l/s) Industria	Peaking Factor	ICI Flow (l/s)	FUTURE ICI Areas (ha) Commerc.	Areas (ha) Industrial	Flows (l/s) Commerc.	Flows (l/s) Industria	Peaking Factor	ICI Flow (l/s)	Cumm. Peak ICI Flow (l/s)	EXISTING EXTRANEOUS Area (Ha)	Peak Extr Flow (l/s)	Cumm. Peak Extr. Flow (l/s)	FUTURE EXTRANEOUS Area (Ha)	Peak Extr. Flow (l/s)	Cumm. Peak Extr. Flow (l/s)	Pump Flow (l/s)	Total Peak Des. Flow (l/s)	Pump Correction Facto (l/s)	Total Peak Des. Flow with pump (l/s)	Q_d/Q_{full} %	Residual Capacity (l/s)	SEWER DATA DIA. (mm)	Actual Dia. (mm)	DESIGN SLOPE (%)	ACTUAL SLOPE (%)	CAPAC. (l/s)	VEL. (m/s)	LENGTH (m)	Upstream Obvert (m)	Upstream Invert (m)	Downstream Obvert (m)	Downstream (m)	Comments
ROGER	855	850	855-850		77.33			157.81		157.8		4.00	0.64		0.0	4.00	0.00	2.56	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.03	0.288	0.288		0.000	0.000		2.845		2.845	12.92	19.174	200	203.20	0.401	0.414	22.019	0.679	31.39	63.22	63.020	63.09	62.890	
	850	845	850-845							157.8		4.00	0.64		0.0	4.00	0.00	2.56	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.288		0.000	0.000		2.845		2.845	13.07	18.925	200	203.20	0.400	0.405	21.770	0.671	12.35	63.05	62.850	63.00	62.800	
	845	840	845-840							157.8		4.00	0.64		0.0	4.00	0.00	2.56	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.288		0.000	0.000		2.845		2.845	13.59	18.085	200	203.20	0.383	0.374	20.930	0.645	37.41	62.95	62.750	62.81	62.610	
	840	835	840-835							157.8		4.00	0.64		0.0	4.00	0.00	2.56	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.288		0.000	0.000		2.845		2.845	12.82	19.354	200	203.20	0.389	0.421	22.199	0.685	11.88	62.76	62.560	62.71	62.510	
	835	830	835-830							157.8		4.00	0.64		0.0	4.00	0.00	2.56	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.288		0.000	0.000		2.845		2.845	11.39	22.126	200	203.20	0.411	0.533	24.971	0.770	39.43	62.66	62.460	62.45	62.250	
RICHER	239	241	239-241							0.0		4.00	0.00		0.0	4.00	0.00	0.00	1.14	0.00	0.37	0.00	1.50	0.554					1.500	0.000	0.554	1.14	0.319	0.319		0.000	0.000		0.873		0.873	2.78	30.594	200	203.20	1.000	0.846	31.467	0.970	20.10	63.30	63.100	63.13	62.930	
RICHER	241	870	241-870							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.554	0.00	0.000	0.319		0.000	0.000		0.873		0.873	2.49	34.269	200	203.20	1.000	1.055	35.142	1.084	9.48	63.13	62.930	63.03	62.830	
RICHER	870	865	870-865							0.0		4.00	0.00		0.0	4.00	0.00	0.00	2.06	0.00	0.67	0.00	1.50	1.002					1.500	0.000	1.556	2.06	0.577	0.896		0.000	0.000		2.452		2.452	5.99	38.460	250	254.00	0.436	0.435	40.912	0.807	80.48	63.11	62.860	62.76	62.510	
	865	860	865-860							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.556	0.00	0.000	0.896		0.000	0.000		2.452		2.452	6.88	33.200	250	254.00	0.343	0.330	35.653	0.704	33.31	62.76	62.510	62.65	62.400	
	860	830	860-830							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.556	0.00	0.000	0.896		0.000	0.000		2.452		2.452	7.34	30.975	250	254.00	0.291	0.290	33.428	0.660	47.88	62.65	62.400	62.52	62.261	MH 830 added later. Do not have as-built info in N/S direction
RICHER	830	815	830-815							157.8		4.00	0.64		0.0	4.00	0.00	2.56	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.556	0.00	0.000	1.184		0.000	0.000		5.297		5.297	15.94	27.930	250	254.00	0.293	0.287	33.227	0.656	74.25	62.51	62.261	62.30	62.048	
LAFLECHE	267	246	267-246							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.72	0.00	0.23	0.00	1.50	0.348					1.500	0.000	0.348	0.72	0.200	0.200		0.000	0.000		0.549		0.549	1.18	46.111	200	203.20	1.000	1.860	46.659	1.439	33.34	63.04	62.840	62.42	62.220	
LAFLECHE	246	825	246-825							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.348	0.00	0.000	0.200		0.000	0.000		0.549		0.549	0.95	57.468	200	203.20	1.000	-2.875	58.016	1.789	13.91	62.42	62.220	62.82	62.620	
LAFLECHE	825	820	825-820							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.348	0.00	0.000	0.200		0.000	0.000		0.549		0.549	1.57	34.431	250	254.00	0.320	0.318	34.979	0.690	69.20	62.46	62.210	62.24	61.990	
	820	819	820-819							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.348	0.00	0.000	0.200		0.000	0.000		0.549		0.549	0.76	71.244	250	254.00	0.350	1.339	71.793	1.417	7.47	62.22	61.970	62.12	61.870	
	247	248	247-248			12.05		17.15		17.2		4.00	0.07		0.0	4.00	0.00	0.28	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.25	0.070	0.070		0.000	0.000		0.348		0.348	1.28	26.795	200	203.20	0.570	0.629	27.143	0.837	15.89	62.69	62.490	62.59	62.390	
	249	248	249-248			12.05		17.15		17.2		4.00	0.07		0.0	4.00	0.00	0.28	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.25	0.070	0.070		0.000	0.000		0.348		0.348	1.34	25.583	200	203.20	0.590	0.574	25.931	0.800	17.41	62.69	62.490	62.59	62.390	
	248	819	248-819							34.3		4.00	0.14		0.0	4.00	0.00	0.56	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.140		0.000	0.000		0.696		0.696	2.35	28.872	200	203.20	0.750	0.747	29.568	0.912	60.26	62.55	62.350	62.10	61.900	
	819	815	819-815							34.3		4.00	0.14		0.0	4.00	0.00	0.56	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.348	0.00	0.000	0.341		0.000	0.000		1.245		1.245	4.27	27.909	250	254.00	0.350	0.221	29.154	0.575	63.40	62.12	61.870	61.98	61.730	
ST. MARIE	900	890	900-890	9.01				23.57		23.6		4.00	0.10		0.0	4.00	0.00	0.38	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.96	0.268	0.268		0.000	0.000		0.650		0.650	3.07	20.506	200	203.20	0.407	0.382	21.156	0.652	96.78	63.04	62.840	62.67	62.470	
ST. MARIE	895	890	895-890	1.13				2.95		2.9		4.00	0.01		0.0	4.00	0.00	0.05	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.15	0.042	0.042		0.000	0.000		0.090		0.090	0.29	31.379	200	203.20	0.900	0.846	31.469	0.970	10.64	63.49	63.290	63.40	63.200	
EASEMENT	890	885	890-885							26.5		4.00	0.11		0.0	4.00	0.00	0.43	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.310		0.000	0.000		0.740		0.740	3.53	20.216	200	203.20	0.382	0.375	20.956	0.646	55.99	62.67	62.470	62.46	62.260	As-built says 'N 62.25 and W62.26' at MH 885. It was assumed that these values are reversed.
	885	875	885-875							26.5		4.00	0.11		0.0	4.00	0.00	0.43	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.310		0.000	0.000		0.740		0.740	4.03	17.640	200	203.20	0.290	0.289	18.380	0.567	69.31	62.45	62.250	62.25	62.050	As-built says 'N 62.25 and W62.26' at MH 885. It was assumed that these values are reversed.
FAUCHER	880	875	880-875	13.51				35.36		35.4		4.00	0.14		0.0	4.00	0.00	0.57	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.13	0.318	0.318		0.000	0.000		0.891		0.891	2.54	34.209	200	203.20	1.000	1.052	35.100	1.082	47.52	62.80	62.600	62.30	62.100	
FAUCHER	875	815	875-815							61.9		4.00	0.25		0.0	4.00	0.00	1.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.628		0.000	0.000		1.630		1.630	8.91	16.668	200	203.20	0.288	0.286	18.299	0.564	94.40	62.25	62.050	61.98	61.780	
ISABELLE	815	810	815-810	4.50				11.79		265.8		4.00	1.08		0.0	4.00	0.00	4.31	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.904	0.43	0.122	2.274		0.000	0.000		8.485		8.485	25.50	24.788	250	254.00	0.296	0.288	33.273	0.657	100.82	61.99	61.740	61.70	61.450	
ISABELLE	810B	810A	810B-810A		29.33			59.86		59.9		4.00	0.24		0.0	4.00	0.00	0.97	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.26	0.072	0.072		0.000	0.000		1.042		1.042	4.42	22.536	200	203.20	0.474	0.475	23.578	0.727	67.39	62.17	61.970	61.85	61.650	
	810A	810	810A-810							59.9		4.00	0.24		0.0	4.00	0.00	0.97	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.072		0.000	0.000		1.042		1.042	3.97	25.197	200	203.20	0.611	0.588	26.239	0.809	20.41	61.80	61.600	61.68	61.480	
ISABELLE	810	795	810-795	4.50				11.79		337.4		4.00	1.37		0.0	4.00	0.00	5.47	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.904	0.41	0.115	2.462		0.000	0.000		9.833		9.833	21.78	35.324	250	254.00	0.525	0.530	45.157	0.891	31.71	61.63	61.378	61.46	61.210	Length may not be as-built / Large slope discrepancy
BOILEAU	805	800	805-800	11.26				29.47		29.5		4.00	0.12		0.0	4.00	0.00	0.48	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.10	0.307	0.307		0.000	0.000		0.785		0.785	3.12	24.403	200	203.20	0.543	0.542	25.188	0.777	27.50	62.00	61.795	61.85	61.646	
	800	795	800-795							29.5		4.00	0.12		0.0	4.00	0.00	0.48	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.307		0.000	0.000		0.785		0.785	3.49	21.720	200	203.20	0.432	0.433	22.505	0.694	84.61	61.84	61.643	61.48	61.277	
ISABELLE	795	765	795-765							366.9		4.00	1.49		0.0	4.00	0.00	5.94	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.904	0.00	0.000	2.769		0.000	0.000		10.618		10.618	26.78	29.036	250	254.00	0.409	0.409	39.654	0.783	70.25	61.46	61.210	61.18	60.923	Length may not be as-built - OMM
SAUVE	790	785	790-785	13.51				35.36		35.4		4.00	0.14		0.0	4.00	0.00	0.57	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.67	0.469	0.469		0.000	0.000		1.042		1.042	2.73	37.161	250	254.00	0.365	0.379	38.203	0.754	33.76	62.51	62.261	62.39	62.133	
	785	780	785-780							35.4		4.00	0.14		0.0	4.00	0.00	0.57	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.469		0.000	0.000		1.042		1.042	3.40	29.635	250	254.00	0.247	0.245	30.677	0.605	57.26	62.38	62.133	62.25	61.993	
	780	775	780-775							35.4		4.00	0.14		0.0	4.00	0.00	0.57	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.469		0.000	0.000		1.042		1.042	2.27	44.868	250	254.00	0.522	0.548	45.910	0.906	22.83	62.20	61.954	62.08	61.829	
	775	770	775-770	10.13				26.52		61.9		4.00	0.25		0.0	4.00	0.00	1.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.01	0.283	0.752		0.000	0.000		1.755		1.755	5.48	30.252	250	254.00	0.266	0.266	32.006	0.632	85.66	61.86	61.609	61.64	61.381	
	770	765	770-765							61.9		4.00	0.25		0.0	4.00	0.00	1.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.752		0.000	0.000		1.755		1.755	5.00	33.327	250	254.00	0.322	0.320	35.081	0.692	46.91	61.32	61.073	61.18	60.923	
ISABELLE	765	760	765-760	5.63				14.73		443.5		4.00	1.80		0.0	4.00	0.00	7.19	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.904	0.55	0.155	3.676		0.000	0.000		12.767		12.767	37.25	21.511	250	254.00	0.298	0.305	34.278	0.676	32.10	61.17	60.920	61.08	60.822	Length may not be as-built - OMM
	760	735	760-735							443.5		4.00	1.80		0.0	4.00	0.00	7.19	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.904	0.00	0.000	3.676		0.000	0.000		12.767		12.767	37.77	21.031	250	254.00	0.299	0.297	33.797	0.667	42.12	61.05	60.802	60.93	60.677	Length may not be as-built - OMM
GAGNE	755	750	755-750	7.88				20.63		20.6		4.00	0.08		0.0	4.00	0.00	0.33	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.56	0.156	0.156		0.000	0.000		0.490		0.490	2.16	22.157	200	203.20	0.436	0.438	22.647	0.698	25.79	62.68	62.484	62.57	62.371	
	750	745	750-745							20.6		4.00	0.08		0.0	4.00	0.00	0.33	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.156		0.000	0.000		0.490		0.490	2.35	20.394	200	203.20	0.365	0.373	20.884	0.644	53.15	62.55	62.347	62.35	62.149	
	745	740	745-740	10.13		0.86		27.74		48.4		4.00	0.20		0.0	4.00	0.00	0.78	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.01	0.282	0.438		0.000	0.000		1.222		1.222	7.31	15.491	200	203.20	0.243	0.239	16.713	0.515	39.40	62.33	62.133	62.24	62.039	
	740	735	740-735							48.4		4.00	0.20		0.0	4.00	0.00	0.78	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.438		0.000	0.000		1.222		1.222	5.74	20.057	200	203.20	0.385	0.387	21.279	0.656	99.29	62.22	62.015	61.83	61.631	
ISABELLE	735	730	735-730	5.63				14.73		506.6		3.97	2.05		0.0	3.97	0.00	8.15	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.904	0.54	0.153	4.267		0.000	0.000		14.321		14.321	37.56	23.805	250	254.00	0.324	0.378	38.126	0.752	20.92	60.90	60.652	60.83	60.573	Length may not be as-built - OMM
	730	PS2	730-PS2							506.6		3.97	2.05		0.0	3.97	0.00	8.15	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.904	0.00	0.000	4.267		0.000	0.000		14.321		14.321	32.62	29.585	250	254.00	0.000	0.501	43.906	0.866	11.58	60.82	60.573	60.77	60.515	Updated in QGIS and manually inputed to included PS2
	PS2	725	PS2-725							506.6		3.97	2.05		0.0	3.97	0.00	8.15	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.904	0.00	0.000	4.267		0.000	0.000	20.500	14.321	6.179	20.500	0.00		250	254.00	0.000	-17.638	0.000	5.142	14.48	60.77	60.515	63.32	63.069	**Forcemain**
	725	715	725-715							506.6		3.97	2.05		0.0	3.97	0.00	8.15	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.904	0.00	0.000	4.267		0.000	0.000		14.321	6.179	20.500	70.46	8.593	250	254.00	0.219	0.220	29.093	0.574	45.47	63.32	63.069	63.22	62.969	
GAGNE	720	715	720-715	11.26				29.47		29.5		4.00	0.12		0.0	4.00	0.00	0.48	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.97	0.271	0.271		0.000	0.000		0.748		0.748	3.76	19.170	200	203.20	0.335	0.339	19.919	0.614	99.74	63.53	63.328	63.19	62.990	
ISABELLE	715	710	715-710	3.38				8.84		544.9		3.95	2.21		0.0	3.95	0.00	8.73	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.904	0.36	0.101	4.638		0.000	0.000		15.272	6.179	21.451	54.64	17.810	250	254.00	0.395	0.400	39.261	0.775	42.70	63.17	62.917	63.00	62.746	
	710	700	710-700							544.9		3.95	2.21		0.0	3.95	0.00	8.73	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.904	0.00	0.000	4.638		0.000	0.000		15.272	6.179	21.451	56.95	16.213	250	254.00	0.373	0.369	37.664	0.743	33.91	63.00	62.746	62.88	62.621	
ALICE	705	700	705-700	5.63				14.73		14.7		4.00	0.06		0.0	4.00	0.00	0.24	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.52	0.147	0.147		0.000	0.000		0.385		0.385	1.80	21.016	200	203.20	0.387	0.391	21.402	0.660	53.93	63.10	62.902	62.89	62.691	
ISABELLE	700	695	700-695	14.63				38.31		597.9		3.93	2.42		0.0	3.93	0.00	9.53	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.904	1.42	0.396	5.181		0.000	0.000		16.612	6.179	22.791	43.63	29.444	250	254.00	0.290	-0.709	52.235	1.031	99.87	62.87	62.621	63.58	63.329	
	695	675	695-675							597.9		3.93	2.42		0.0	3.93	0.00	9.53	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.904	0.00	0.000	5.181		0.000	0.000		16.612	6.179	22.791	66.71	11.376	250	254.00	0.306	0.303	34.167	0.674	95.28	62.56	62.310	62.28	62.021	
ALICE	690	685	690-685	18.01				47.15		47.1		4.00	0.19		0.0	4.00	0.00	0.76	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.77	0.496	0.496		0.000	0.000		1.260		1.260	5.85	20.279	200	203.20	0.393	0.396	21.539	0.664	88.33	63.27	63.072	62.93	62.722	
	685	680	685-680							47.1		4.00	0.19		0.0	4.00	0.00	0.76	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.496		0.000	0.000		1.260		1.260	6.03	19.650	200	203.20	0.371	0.373	20.910	0.645	88.10	62.90	62.703	62.58	62.374	
	680	675	680-675	4.50				11.79		58.9		4.00	0.24		0.0	4.00	0.00	0.95	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.45	0.126	0.622		0.000	0.000		1.577		1.577	7.21	20.305	200	203.20	0.405	0.409	21.882	0.675	69.44	62.54	62.341	62.26	62.057	Length may not be as-built - OMM
ISABELLE	675	665	675-665	4.50				11.79		668.7		3.91	2.71		0.0	3.91	0.00	10.58	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.904	0.46	0.128	5.931		0.000	0.000		18.415	6.179	24.594	72.86	9.159	250	254.00	0.288	0.296	33.754	0.666	91.55	62.24	61.990	61.97	61.719	
ALBERT	670	665	670-665	12.38				32.41		32.4		4.00	0.13		0.0	4.00	0.00	0.53	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.95	0.265	0.265		0.000	0.000		0.790		0.790	3.64	20.883	200	203.20	0.402	0.401	21.673	0.668	107.93	62.40	62.201	61.97	61.768	
ISABELLE	665	660	665-660	6.75				17.68		718.8		3.89	2.91		0.0	3.89	0.00	11.32	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.904	0.81	0.228	6.423		0.000	0.000		19.648	6.179	25.827	79.75	6.558	250	254.00	0.272	0.272	32.385	0.639	55.05	61.95	61.704	61.81	61.554	
	660	620	660-620							718.8		3.89	2.91		0.0	3.89	0.00	11.32	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.904	0.00	0.000	6.423		0.000	0.000		19.648	6.179	25.827	66.04	13.279	250	254.00	0.400	0.397	39.105	0.772	68.96	61.80	61.554	61.53	61.280	Not sure if U/S or lengths are as-built, Downstream Invert was taken from JLR DWG 68-1130-05, Sewer Rehab.(PLAN & PROFILES)
	620	615	620-615	5.63				14.73		1255.8		3.73	5.09		0.0	3.73	0.00	19.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	4.994	0.80	0.224	13.010		0.000	0.000		37.000	13.223	50.222	116.20	-7.000	300	304.80	0.183	0.184	43.222	0.592	59.92	61.56	61.260	61.45	61.150	
	615	535	615-535							1255.8		3.73	5.09		0.0	3.73	0.00	19.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	4.994	0.00	0.000	13.010		0.000	0.000		37.000	13.223	50.222	87.54	7.148	300	304.80	0.280	0.323	57.371	0.786	46.38	61.43	61.130	61.28	60.980	
PERCY	610	600	610-600	4.50				11.79		11.8		4.00	0.05		0.0	4.00	0.00	0.19	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.43	0.121	0.121		0.000	0.000		0.311		0.311	0.80	38.475	250	254.00	0.390	0.391	38.786	0.765	60.89	62.80	62.554	62.57	62.316	
PERCY	605	600	605-600	3.38				8.84		8.8		4.00	0.04		0.0	4.00	0.00	0.14	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.28	0.079	0.079		0.000	0.000		0.223		0.223	0.50	44.070	250	254.00	0.510	0.510	44.293	0.874	19.81	62.67	62.417	62.57	62.316	
DESNOYERS	600	595	600-595	16.89		0.86		45.42		66.0		4.00	0.27		0.0	4.00	0.00	1.07	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.71	0.479	0.679		0.000	0.000		1.749		1.749	7.29	22.259	250	254.00	0.150	0.150	24.008	0.474	66.77	62.57	62.316	62.47	62.216	
	595	590	595-590							66.0		4.00	0.27		0.0	4.00	0.00	1.07	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.679		0.000	0.000		1.749		1.749	5.37	30.836	250	254.00	0.280	0.276	32.585	0.643	112.73	62.47	62.216	62.16	61.905	
	590	545	590-545							66.0		4.00	0.27		0.0	4.00	0.00	1.07	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.679		0.000	0.000		1.749		1.749	3.83	43.883	250	254.00	0.230	0.541	45.632	0.901	65.43	62.16	61.905	61.81	61.551	
FLEURETTE STREET	580	570	580-570	4.50				11.79		11.8		4.00	0.05		0.0	4.00	0.00	0.19	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.52	0.145	0.145		0.000	0.000		0.336		0.336	0.85	39.191	250	254.00	0.406	0.406	39.527	0.780	34.49	62.92	62.670	62.78	62.530	
FLEURETTE CIRCLE	575	570	575-570	9.01				23.57		23.6		4.00	0.10		0.0	4.00	0.00	0.38	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.13	0.317	0.317		0.000	0.000		0.699		0.699	1.21	57.259	300	304.80	0.440	0.330	57.958	0.794	69.68	63.15	62.850	62.92	62.620	
FLEURETTE STREET	570	565	570-565							35.4		4.00	0.14		0.0	4.00	0.00	0.57	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.462		0.000	0.000		1.035		1.035	2.41	41.919	250	254.00	0.478	0.479	42.954	0.848	64.67	62.77	62.520	62.46	62.210	
PERCY	585	565	585-565	7.88				20.63		20.6		4.00	0.08		0.0	4.00	0.00	0.33	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.80	0.225	0.225		0.000	0.000		0.559		0.559	1.71	32.044	250	254.00	0.280	0.276	32.603	0.643	101.74	62.60	62.350	62.32	62.069	Length may not be as-built. ST and SAN MHs were switched during const.
PERCY	565	550	565-550	5.63			2.00	14.73		70.7		4.00	0.29		0.0	4.00	0.00	1.15	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.53	0.150	0.836		0.000	0.000		1.982		1.982	6.28	29.560	250	254.00	0.290	0.258	31.542	0.622	65.77	62.32	62.069	62.15	61.899	Length may not be as-built. ST and SAN MHs were switched during const.
PERCY	560	555	560-555	12.38				32.41		32.4		4.00	0.13		0.0	4.00	0.00	0.53	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.01	0.282	0.282		0.000	0.000		0.807		0.807	2.59	30.394	250	254.00	0.280	0.253	31.201	0.616	62.86	62.48	62.228	62.32	62.069	Length may not be as-built
	555	550	555-550							32.4		4.00	0.13		0.0	4.00	0.00	0.53	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.282		0.000	0.000		0.807		0.807	2.38	33.055	250	254.00	0.280	0.298	33.862	0.668	43.97	62.32	62.069	62.19	61.938	Length may not be as-built
JEAN MARC	550	545	550-545							103.1		4.00	0.42		0.0	4.00	0.00	1.67	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	1.118		0.000	0.000		2.789		2.789	7.48	34.518	250	254.00	0.365	0.362	37.307	0.736	81.85	62.10	61.847	61.81	61.551	
DESNOYERS	545	540	545-540	10.13				26.52		195.7		4.00	0.79		0.0	4.00	0.00	3.17	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.94	0.262	2.060		0.000	0.000		5.231		5.231	18.70	22.740	250	254.00	0.204	0.203	27.970	0.552	103.81	61.77	61.515	61.56	61.304	Note: Two as-built refs. give U/S inv. As 61.515. However, there is one ref. with U/S inv. as 61.521
	540	535	540-535	7.88				20.63		216.3		4.00	0.88		0.0	4.00	0.00	3.51	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.95	0.265	2.325		0.000	0.000		5.830		5.830	18.33	25.970	250	254.00	0.290	0.263	31.800	0.628	92.87	61.55	61.304	61.31	61.060	Downstream Invert was taken from JLR DWG 68-1130-05, Sewer Rehab.(PLAN & PROFILES)

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

VILLAGE OF CASSELMAN: SANITARY SEWER AND WATER MASTER PLAN
JLR No. 16953-119

Future Sanitary Sewer System - September 2023 (Existing Conditions)

SANITARY SEWER DESIGN SHEET

🟧 Downstream Runs
☐ If population changes, please change value in this cell

Prepared by: M.L.
Checked by: B.P.

Design Constants/Coefficients

Manning's "n" =	0.013	
Infilt. Allowance =	0.28	L/s/ha
Residential Flow =	350	L/cap/d
Commercial/Institutional Flow Rate =	28000	L/gross ha/d
Industrial Flow Rate =	35000	L/gross ha/d

Unless otherwise indicated, Manning's 'n' is assumed to be 0.013

Population Data (Existing)

Total Number of Units:	1695
Census Existing Population:	4048
Population Calibration Factor:	0.791
Computed Population:	4048
Harmon Equation Correction Factor:	1.0
Weighted Coefficients	
Singles & Semi-Detached:	2.62
Multiple Dwellings:	2.04
Apartments:	1.42
ICI peaking factor:	1.50
PPU:	2.39

Population Data (New Subdivision)

Single Family:	3.4	persons/unit
Townhouse:	2.7	persons/unit
Semi-detached:	2.70	persons/unit
Apartments:	1.80	persons/unit
Duplex:	2.30	persons/unit
Res. Flow:	350	L/cap/d
Infilt. Allowance:	0.28	L/ha/s

STREET	MANHOLE NUMBER FROM	MANHOLE NUMBER TO	FROM MH - TO MH	Existing Residential Area – Census Data: Singles & Semis (units)	Census Data: Multiple Dwellings (units)	Census Data: Apart (units)	Census Data: Vacant	Popul. (peop.)	Metered Residential	Cumm. Popul. (peop.)	Cumm. Metered Residential (L/s)	Peaking Factor	Avg. Flow (l/s)	Future Residential – Popul. (peop.)	Cumm. Popul. (peop.)	Peaking Factor	Avg. Flow	Peak Res. Flow (l/s)	Existing ICI – Areas (ha) Commerc.	Areas (ha) Industrial	Flows (l/s) Commerc./I	Flows (l/s) Industrial	Peaking Factor	ICI Flow (l/s)	Future ICI – Areas (ha) Commerc.	Areas (ha) Industrial	Flows (l/s) Commerc.	Flows (l/s) Industrial	Peaking Factor	ICI Flow (l/s)	Cumm. Peak ICI Flow (l/s)	Existing Extraneous – Area (Ha)	Peak Extr Flow (l/s)	Cumm. Peak Extr. Flow (l/s)	Future Extraneous – Area (Ha)	Peak Extr. Flow (l/s)	Cumm. Peak Extr. Flow (l/s)	Pump Flow (l/s)	Total Peak Des. Flow (l/s)	Pump Correction Factor (l/s)	Total Peak Des. Flow with pump (l/s)	Q_d/Q_{full} %	Residual Capacity (l/s)	Sewer Data – DIA. (mm)	Actual Dia. (mm)	DESIGN SLOPE (%)	ACTUAL SLOPE (%)	CAPAC. (l/s)	VEL. (m/s)	LENGTH (m)	Upstream Obvert (m)	Upstream Invert (m)	Downstream Obvert (m)	Downstream (m)	Comments
ST. ISIDORE (WEST)	535	530	535-530	16.89	2.67	0.86	1.00	50.87		1523.0		3.67	6.17		0.0	3.67	0.00	22.67	2.30	0.00	0.75	0.00	1.50	1.120					1.500	0.000	6.114	2.30	0.645	15.980		0.000	0.000		44.766	13.223	57.989	155.85	-20.780	300	304.80	0.280	0.136	37.209	0.510	73.51	61.27	60.970	61.17	60.870	DWGs did not have as-built lengths or slopes. Lengths were scaled from DWGs. Inverts & lengths were taken from JLR DWG 68-1130-05. Sewer Rehab.(PLAN & PROFILES)
	530	525	530-525							1523.0		3.67	6.17		0.0	3.67	0.00	22.67	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	6.114	0.00	0.000	15.980		0.000	0.000		44.766	13.223	57.989	121.11	-10.106	300	304.80	0.220	0.225	47.882	0.656	106.53	61.14	60.840	60.90	60.600	DWGs did not have as-built lengths or slopes. Lengths were scaled from DWGs. Inverts & lengths were taken from JLR DWG 68-1130-05. Sewer Rehab.(PLAN & PROFILES)
ST. ANNE	990	985	990-985	14.63				38.31		38.3		4.00	0.16		0.0	4.00	0.00	0.62	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.57	0.439	0.439		0.000	0.000		1.060		1.060	5.02	20.043	200	203.20	0.380	0.380	21.102	0.651	98.07	63.65	63.452	63.28	63.079	
	985	980	985-980							38.3		4.00	0.16		0.0	4.00	0.00	0.62	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.439		0.000	0.000		1.060		1.060	5.08	19.806	200	203.20	0.371	0.372	20.865	0.643	85.25	63.23	63.030	62.92	62.713	
	980	975	980-975	10.13				26.52		64.8		4.00	0.26		0.0	4.00	0.00	1.05	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.96	0.268	0.707		0.000	0.000		1.758		1.758	8.54	18.823	200	203.20	0.364	0.362	20.580	0.635	72.42	62.90	62.697	62.64	62.435	
	975	970	975-970							64.8		4.00	0.26		0.0	4.00	0.00	1.05	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.707		0.000	0.000		1.758		1.758	8.69	18.462	200	203.20	0.347	0.349	20.219	0.623	74.17	62.63	62.426	62.37	62.167	
	970	965	970-965	7.88	5.33			31.51		96.3		4.00	0.39		0.0	4.00	0.00	1.56	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.78	0.219	0.926		0.000	0.000		2.487		2.487	12.13	18.010	200	203.20	0.364	0.359	20.497	0.632	89.18	62.34	62.140	62.02	61.820	
	965	905	965-905							96.3		4.00	0.39		0.0	4.00	0.00	1.56	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.926		0.000	0.000		2.487		2.487	9.33	24.168	200	203.20	0.488	0.607	26.655	0.822	20.93	61.72	61.521	61.60	61.394	Do not have as-built inverts U/S or D/S of 905. Compute using slope and scaled length.
FAUCHER	960	955	960-955	9.01				23.57		23.6		4.00	0.10		0.0	4.00	0.00	0.38	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.91	0.255	0.255		0.000	0.000		0.637		0.637	2.55	24.369	200	203.20	0.531	0.534	25.006	0.771	54.67	63.91	63.709	63.62	63.417	
	955	945	955-945							23.6		4.00	0.10		0.0	4.00	0.00	0.38	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.255		0.000	0.000		0.637		0.637	2.95	20.979	200	203.20	0.399	0.399	21.616	0.667	71.41	63.62	63.417	63.34	63.132	
COURT 'B'	950	945	950-945	4.50				11.79		11.8		4.00	0.05		0.0	4.00	0.00	0.19	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.95	0.267	0.267		0.000	0.000		0.458		0.458	1.71	26.391	200	203.20	0.617	0.616	26.849	0.828	48.89	63.88	63.679	63.58	63.378	
FAUCHER	945	940	945-940							35.4		4.00	0.14		0.0	4.00	0.00	0.57	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.90	0.252	0.774		0.000	0.000		1.347		1.347	6.42	19.632	200	203.20	0.374	0.376	20.979	0.647	77.41	63.33	63.132	63.04	62.841	
	940	930	940-930	9.01				23.57		58.9		4.00	0.24		0.0	4.00	0.00	0.95	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.774		0.000	0.000		1.729		1.729	7.90	20.165	200	203.20	0.410	0.409	21.894	0.675	77.43	63.04	62.841	62.73	62.524	
COURT 'A'	935	930	935-930	6.75				17.68		17.7		4.00	0.07		0.0	4.00	0.00	0.29	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.06	0.297	0.297		0.000	0.000		0.584		0.584	2.84	19.950	200	203.20	0.370	0.360	20.534	0.633	48.31	62.95	62.746	62.78	62.572	
FAUCHER	930	925	930-925	9.01				23.57		100.2		4.00	0.41		0.0	4.00	0.00	1.62	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.92	0.258	1.329		0.000	0.000		2.953		2.953	13.66	18.671	200	203.20	0.401	0.399	21.623	0.667	74.37	62.72	62.524	62.43	62.227	
	925	915	925-915							100.2		4.00	0.41		0.0	4.00	0.00	1.62	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	1.329		0.000	0.000		2.953		2.953	13.39	19.096	200	203.20	0.417	0.415	22.049	0.680	51.06	62.43	62.227	62.22	62.015	
ALBERT	920	915	920-915	6.75				17.68		17.7		4.00	0.07		0.0	4.00	0.00	0.29	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.73	0.206	0.206		0.000	0.000		0.492		0.492	2.29	21.032	200	203.20	0.392	0.396	21.525	0.664	75.30	62.50	62.300	62.21	62.002	
EASEMENT	915	910	915-910							117.9		4.00	0.48		0.0	4.00	0.00	1.91	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	1.535		0.000	0.000		3.445		3.445	14.93	19.624	200	203.20	0.477	0.455	23.069	0.711	69.30	62.12	61.920	61.81	61.605	
	910	905	910-905	5.63				14.73		132.6		4.00	0.54		0.0	4.00	0.00	2.15	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.35	0.097	1.632		0.000	0.000		3.781		3.781	16.99	18.469	200	203.20	0.361	0.423	22.250	0.686	39.02	61.81	61.605	61.64	61.440	
ST. ANNE	905	525	905-525							228.9		4.00	0.93		0.0	4.00	0.00	3.71	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	2.559		0.000	0.000		6.268		6.268	19.72	25.523	200	203.20	0.917	0.863	31.791	0.980	65.33	61.59	61.394	61.03	60.830	Downstream Invert was taken from JLR DWG 68-1130-05, Sewer Rehab.(PLAN & PROFILES)
ST. ISIDORE (WEST)	525	520	525-520							1751.9		3.63	7.10		0.0	3.63	0.00	25.76	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	6.114	0.00	0.000	18.539		0.000	0.000		50.413	13.223	63.636	163.31	-24.669	300	304.80	0.149	0.149	38.967	0.534	87.13	60.85	60.550	60.72	60.420	DWGs did not have as-built lengths or slopes. Lengths were scaled from DWGs. Inverts & lengths were taken from JLR DWG 68-1130-05. Sewer Rehab.(PLAN & PROFILES)
ST. JOSEPH (NORTH)	520	515	520-515	3.38				8.84		2033.3		3.58	8.24		0.0	3.58	0.00	29.49	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	26.337	0.43	0.120	30.920		0.000	0.000		86.746	36.223	122.969	88.96	15.254	450	457.20	0.217	0.216	138.223	0.842	101.87	60.83	60.380	60.62	60.160	DWGs did not have as-built lengths or slopes. Lengths were scaled from DWGs. Inverts & lengths were taken from JLR DWG 68-1130-05. Sewer Rehab.(PLAN & PROFILES)
STATION	520A	515	520A-515	6.75		0.86		18.90		18.9		4.00	0.08		0.0	4.00	0.00	0.31	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.58	0.162	0.162		0.000	0.000		0.469		0.469	0.57	81.915	200	203.20	0.400	5.797	82.384	2.540	38.16	62.63	62.432	60.42	60.220	Downstream Invert was taken from JLR DWG 68-1130-05, Sewer Rehab.(PLAN & PROFILES)
ST. JOSEPH (NORTH)	515	505	515-505							2052.2		3.58	8.31		0.0	3.58	0.00	29.74	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	26.337	0.00	0.000	31.082		0.000	0.000		87.156	36.223	123.379	90.68	12.688	450	457.20	0.200	0.209	136.068	0.829	59.73	60.61	60.155	60.49	60.030	DWGs did not have as-built lengths or slopes. Lengths were scaled from DWGs. Inverts & lengths were taken from JLR DWG 68-1130-05. Sewer Rehab.(PLAN & PROFILES)
CARTIER	510	505	510-505	23.64	10.67	3.44		88.55		88.5		4.00	0.36		0.0	4.00	0.00	1.43	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.79	0.502	0.502		0.000	0.000		1.937		1.937	2.15	88.319	200	203.20	0.400	6.958	90.256	2.783	30.84	62.49	62.286	60.34	60.140	Downstream Invert was taken from JLR DWG 68-1130-05, Sewer Rehab.(PLAN & PROFILES)
ST. JOSEPH (NORTH)	505	500	505-500							2140.7		3.56	8.67		0.0	3.56	0.00	30.90	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	26.337	0.00	0.000	31.584		0.000	0.000		88.817	36.223	125.040	94.11	7.823	450	457.20	0.205	0.200	132.863	0.809	95.22	60.46	60.010	60.28	59.820	DWG does not show inverts for MH500. Invert for MH500 from JLR survey was missed. Invert from original JLR drawings was used instead.
	500	460	500-460							2140.7		3.56	8.67		0.0	3.56	0.00	30.90	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	26.337	0.00	0.000	31.584		0.000	0.000		88.817	36.223	125.040	88.05	16.977	450	457.20	0.223	0.228	142.017	0.865	87.73	60.27	59.820	60.08	59.620	DWG does not show inverts for MH500. Invert for MH500 from JLR survey was missed. Invert from original JLR drawings was used instead.
LAVAL	495	485	495-485	5.63				14.73		14.7		4.00	0.06		0.0	4.00	0.00	0.24	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.53	0.149	0.149		0.000	0.000		0.388		0.388	1.42	26.890	200	203.20	0.400	0.636	27.278	0.841	58.06	63.18	62.984	62.82	62.615	
CARTIER	490	485	490-485	4.50				11.79		11.8		4.00	0.05		0.0	4.00	0.00	0.19	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.40	0.112	0.112		0.000	0.000		0.303		0.303	1.44	20.781	200	203.20	0.379	0.380	21.084	0.650	72.43	63.10	62.902	62.83	62.627	As-built shows 2 different numbers for D/S invert. Not sure which is correct
LAVAL	485	480	485-480							26.5		4.00	0.11		0.0	4.00	0.00	0.43	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.261		0.000	0.000		0.691		0.691	3.33	20.074	200	203.20	0.371	0.368	20.765	0.640	87.70	62.82	62.615	62.50	62.292	
	480	465	480-465							26.5		4.00	0.11		0.0	4.00	0.00	0.43	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.261		0.000	0.000		0.691		0.691	3.15	21.276	200	203.20	0.413	0.412	21.967	0.677	95.35	62.49	62.292	62.10	61.899	As-built length shows 312' on one DWG and 313' on another. 312.5' was used in D. Sheet
LAVAL	475	470	475-470	7.88		2.58		24.30		24.3		4.00	0.10		0.0	4.00	0.00	0.39	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.37	0.384	0.384		0.000	0.000		0.778		0.778	3.55	21.144	200	203.20	0.413	0.410	21.922	0.676	72.11	62.63	62.429	62.34	62.133	
	470	465	470-465							24.3		4.00	0.10		0.0	4.00	0.00	0.39	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.384		0.000	0.000		0.778		0.778	3.60	20.825	200	203.20	0.400	0.399	21.602	0.666	67.24	62.33	62.133	62.07	61.865	
DOLLARD	465	460	465-460	15.76				41.25		92.1		4.00	0.37		0.0	4.00	0.00	1.49	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.65	0.461	1.106		0.000	0.000		2.598		2.598	3.06	82.318	250	254.00	0.280	1.874	84.916	1.676	114.06	62.06	61.807	59.92	59.670	Downstream Invert was taken from JLR DWG 68-1130-05, Sewer Rehab.(PLAN & PROFILES)
ST. JOSEPH (NORTH)	460	455	460-455	16.89	8.00	5.16		67.88		2300.7		3.54	9.32		0.0	3.54	0.00	32.97	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	26.337	2.07	0.580	33.270		0.000	0.000		92.579	36.223	128.802	75.15	42.589	500	508.00	0.194	0.189	171.391	0.846	79.24	60.09	59.590	59.95	59.440	DWGs did not have as-built lengths or slopes. Lengths were scaled from DWGs. Inverts & lengths were taken from JLR DWG 68-1130-05. Sewer Rehab.(PLAN & PROFILES)
	455	305B	455-305B							2300.7		3.54	9.32		0.0	3.54	0.00	32.97	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	26.337	0.00	0.000	33.270		0.000	0.000		92.579	36.223	128.802	67.78	61.239	500	508.00	0.233	0.233	190.041	0.938	81.64	59.92	59.420	59.74	59.230	DWGs did not have as-built lengths or slopes. Lengths were scaled from DWGs. Inverts & lengths were taken from JLR DWG 68-1130-05. Sewer Rehab.(PLAN & PROFILES)
DROUIN	450	445	450-445	4.50				11.79		11.8		4.00	0.05		0.0	4.00	0.00	0.19	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.45	0.407	0.407		0.000	0.000		0.598		0.598	0.69	86.382	250	254.00	1.500	1.966	86.980	1.717	12.21	61.64	61.390	61.40	61.150	
	445	440	445-440							11.8		4.00	0.05		0.0	4.00	0.00	0.19	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.407		0.000	0.000		0.598		0.598	0.71	83.377	250	254.00	2.000	1.832	83.976	1.657	43.66	61.39	61.140	60.59	60.340	
	440	435	440-435							11.8		4.00	0.05		0.0	4.00	0.00	0.19	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.407		0.000	0.000		0.598		0.598	0.91	65.311	250	254.00	1.000	1.129	65.909	1.301	38.10	60.53	60.280	60.10	59.850	
	435	430	435-430	24.76				64.82		76.6		4.00	0.31		0.0	4.00	0.00	1.24	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	2.84	0.795	1.202		0.000	0.000		2.444		2.444	6.53	34.983	250	254.00	0.400	0.364	37.426	0.739	54.95	60.05	59.800	59.85	59.600	
	430	425	430-425							76.6		4.00	0.31		0.0	4.00	0.00	1.24	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	1.202		0.000	0.000		2.444		2.444	6.17	37.192	250	254.00	0.400	0.408	39.635	0.782	107.80	59.71	59.460	59.27	59.020	
	425	395	425-395							76.6		4.00	0.31		0.0	4.00	0.00	1.24	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	1.202		0.000	0.000		2.444		2.444	6.07	37.805	250	254.00	0.400	0.421	40.248	0.794	57.02	59.25	59.000	59.01	58.760	
MARQUETTE	420	415	420-415	16.89				44.20		44.2		4.00	0.18		0.0	4.00	0.00	0.72	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.68	0.471	0.471		0.000	0.000		1.188		1.188	2.68	43.151	250	254.00	0.413	0.511	44.338	0.875	37.20	60.72	60.470	60.53	60.280	Not as-built
	415	410	415-410							44.2		4.00	0.18		0.0	4.00	0.00	0.72	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.471		0.000	0.000		1.188		1.188	3.03	37.972	250	254.00	0.400	0.398	39.159	0.773	105.41	60.50	60.250	60.08	59.830	Not as-built
	410	400	410-400							44.2		4.00	0.18		0.0	4.00	0.00	0.72	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.471		0.000	0.000		1.188		1.188	2.97	38.792	250	254.00	0.400	0.415	39.980	0.789	48.16	59.93	59.680	59.73	59.480	Not as-built
JOLIETTE	405	400	405-400	10.13				26.52		26.5		4.00	0.11		0.0	4.00	0.00	0.43	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.04	0.291	0.291		0.000	0.000		0.720		0.720	1.80	39.221	250	254.00	0.407	0.414	39.941	0.788	57.90	59.57	59.320	59.33	59.080	Not as-built
JOLIETTE	400	395	400-395							70.7		4.00	0.29		0.0	4.00	0.00	1.15	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.762		0.000	0.000		1.908		1.908	4.95	36.646	250	254.00	0.386	0.386	38.554	0.761	82.86	59.33	59.080	59.01	58.760	Not as-built
DROUIN	395	PS4	395-PS4							147.3		4.00	0.60		0.0	4.00	0.00	2.39	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	1.964		0.000	0.000		4.352		4.352	12.11	31.583	250	254.00	0.330	0.336	35.935	0.709	38.75	58.96	58.710	58.83	58.580	Not as-built
(forcemain)	PS4	390	PS4-390							147.3		4.00	0.60		0.0	4.00	0.00	2.39	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	1.964		0.000	0.000	18.500	4.352	14.148	18.500	0.00		250	254.00	-3.740	-3.738	0.000	2.367	62.88	58.83	58.580	61.18	60.930	**Forcemain**
LEVESQUES	390	385	390-385	7.88				20.63		168.0		4.00	0.68		0.0	4.00	0.00	2.72	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.53	0.427	2.391		0.000	0.000		5.113	14.148	19.261	34.93	35.884	300	304.80	0.299	0.299	55.145	0.756	66.93	61.23	60.930	61.03	60.730	Not as-built
	385	380	385-380							168.0		4.00	0.68		0.0	4.00	0.00	2.72	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	2.391		0.000	0.000		5.113	14.148	19.261	43.25	25.269	300	304.80	0.190	0.195	44.530	0.610	20.53	61.00	60.700	60.96	60.660	Not as-built
	380	375	380-375	25.89				67.77		235.7		4.00	0.95		0.0	4.00	0.00	3.82	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	2.89	0.808	3.199		0.000	0.000		7.019	14.148	21.168	46.54	24.310	300	304.80	0.202	0.203	45.478	0.623	83.65	60.93	60.630	60.76	60.460	Not as-built
	375	370	375-370							235.7		4.00	0.95		0.0	4.00	0.00	3.82	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	3.199		0.000	0.000		7.019	14.148	21.168	47.20	23.678	300	304.80	0.200	0.198	44.845	0.615	101.21	60.76	60.460	60.56	60.260	Not as-built
	370	365	370-365							235.7		4.00	0.95		0.0	4.00	0.00	3.82	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	3.199		0.000	0.000		7.019	14.148	21.168	45.86	24.985	300	304.80	0.200	0.209	46.153	0.633	66.89	60.56	60.260	60.42	60.120	Not as-built
	365	335	365-335							235.7		4.00	0.95		0.0	4.00	0.00	3.82	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	3.199		0.000	0.000		7.019	14.148	21.168	45.16	25.707	300	304.80	0.200	0.216	46.875	0.642	18.53	60.42	60.120	60.38	60.080	Not as-built
DROUIN	360	355	360-355	23.64				61.88		61.9		4.00	0.25		0.0	4.00	0.00	1.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	3.12	0.873	0.873		0.000	0.000		1.876		1.876	3.65	49.532	300	304.80	0.270	0.260	51.408	0.705	19.25	61.09	60.790	61.04	60.740	Not as-built
	355	350	355-350							61.9		4.00	0.25		0.0	4.00	0.00	1.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.873		0.000	0.000		1.876		1.876	4.09	43.974	300	304.80	0.210	0.207	45.850	0.628	101.66	61.04	60.740	60.83	60.530	Not as-built
	350	345	350-345							61.9		4.00	0.25		0.0	4.00	0.00	1.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.873		0.000	0.000		1.876		1.876	3.83	47.159	300	304.80	0.200	0.236	49.035	0.672	105.82	60.79	60.490	60.54	60.240	Length is not as-built. Portion of this run had to be scaled from DWG.
LEVESQUES	345	340	345-340	5.63				14.73		76.6		4.00	0.31		0.0	4.00	0.00	1.24	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.71	0.199	1.072		0.000	0.000		2.314		2.314	4.88	45.137	300	304.80	0.200	0.221	47.451	0.650	81.36	60.50	60.200	60.32	60.020	
	340	335	340-335							76.6		4.00	0.31		0.0	4.00	0.00	1.24	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	1.072		0.000	0.000		2.314		2.314	4.47	49.466	300	304.80	0.200	0.263	51.780	0.710	15.18	60.31	60.010	60.27	59.970	
EASEMENT	335	330	335-330							312.3		4.00	1.27		0.0	4.00	0.00	5.06	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	4.272		0.000	0.000		9.333	14.148	23.481	51.19	22.386	300	304.80	0.207	0.207	45.867	0.629	48.38	60.24	59.940	60.14	59.840	
	330	320	330-320	7.88				20.63		333.0		4.00	1.35		0.0	4.00	0.00	5.40	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.91	0.254	4.525		0.000	0.000		9.921	14.148	24.069	53.32	21.068	300	304.80	0.200	0.200	45.137	0.619	34.97	60.12	59.820	60.05	59.750	
LAVAL	325	320	325-320	5.63				14.73		14.7		4.00	0.06		0.0	4.00	0.00	0.24	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.10	0.309	0.309		0.000	0.000		0.547		0.547	1.89	28.361	250	254.00	0.220	0.217	28.908	0.571	92.11	60.25	60.000	60.05	59.800	
LAVAL	320	315	320-315							347.7		4.00	1.41		0.0	4.00	0.00	5.63	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	4.834		0.000	0.000		10.468	14.148	24.616	50.05	24.569	300	304.80	0.200	0.238	49.185	0.674	29.45	60.02	59.720	59.95	59.650	
MONTCALM	315	310	315-310	5.63		8.61		26.99		374.7		4.00	1.52		0.0	4.00	0.00	6.07	1.83	0.00	0.59	0.00	1.50	0.888					1.500	0.000	0.888	1.83	0.511	5.345		0.000	0.000		12.304	14.148	26.452	52.46	23.969	300	304.80	0.280	0.250	50.421	0.691	120.09	59.93	59.630	59.63	59.330	Downstream Invert was taken from JLR DWG 68-1130-05, Sewer Rehab.(PLAN & PROFILES)
	310	305B	310-305B							374.7		4.00	1.52		0.0	4.00	0.00	6.07	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.888	0.00	0.000	5.345		0.000	0.000		12.304	14.148	26.452	65.72	13.798	300	304.80	-0.161	-0.159	40.250	0.552	12.56	59.56	59.260	59.58	59.280	U/S & D/S Invert were taken from JLR DWG 68-1130-05, Sewer Rehab.(PLAN & PROFILES)
MONTCALM	305A	305B	305A-305B	1.13		5.16		10.30		10.3		4.00	0.04		0.0	4.00	0.00	0.17	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.36	0.101	0.101		0.000	0.000		0.268		0.268	0.51	52.411	200	203.20	2.000	2.370	52.679	1.624	90.71	61.95	61.750	59.80	59.600	No as-built. Length and U/S invert has been scaled from another as-built DWG.
MONTCALM	305B	300	305B-300							2685.7		3.48	10.88		0.0	3.48	0.00	37.89	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	27.225	0.00	0.000	38.716		0.000	0.000		103.832	50.371	154.204	123.29	-29.127	500	508.00	0.160	0.101	125.077	0.617	36.70	59.74	59.241	59.71	59.204	DWGs did not have as-built lengths or slopes. Lengths were scaled from DWGs. Inverts & lengths were taken from JLR DWG 68-1130-05. Sewer Rehab.(PLAN & PROFILES)

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

VILLAGE OF CASSELMAN: SANITARY SEWER AND WATER MASTER PLAN
JLR No. 16953-119

Future Sanitary Sewer System - September 2023 (Existing Conditions)

SANITARY SEWER DESIGN SHEET

Design Constants/Coefficients

Manning's "n" =	0.013	
Infilt. Allowance =	0.28	L/s/ha
Residential Flow =	350	L/cap/d
Commercial/Institutional Flow Rate =	28000	L/gross ha/d
Industrial Flow Rate =	35000	L/gross ha/d

Unless otherwise indicated, Manning's 'n' is assumed to be 0.013

Population Data (Existing)

Total Number of Units:	1695
Census Existing Population:	4048
Population Calibration Factor:	0.791
Computed Population:	4048
Harmon Equation Correction Factor:	1.0
Weighted Coefficients	
Singles & Semi-Detached:	2.62
Multiple Dwellings:	2.04
Apartments:	1.42
ICI peaking factor:	1.50
PPU:	2.39

Population Data (New Subdivision)

Single Family:	3.4	persons/unit
Townhouse:	2.7	persons/unit
Semi-detached:	2.70	persons/unit
Apartments:	1.80	persons/unit
Duplex:	2.30	persons/unit
Res. Flow:	350	L/cap/d
Infilt. Allowance:	0.28	L/ha/s

🟧 Downstream Runs
🟩 If population changes, please change value in this cell

Prepared by: M.L.
Checked by: B.P.

STREET	MANHOLE NUMBER		FROM MH - TO MH	SANITARY CONTRIBUTION																																				Pump Correction Facto (l/s)	Total Peak Des. Flow with pump (l/s)	Q_d/Q_{full} %	Residual Capacity (l/s)	SEWER DATA							Upstream Obvert (m)	Upstream Invert (m)	Downstream Obvert (m)	Downstream (m)	Comments
				EXISTING RESIDENTIAL AREA										FUTURE RESIDENTIAL					EXISTING ICI						FUTURE ICI							EXISTING EXTRANEOUS			FUTURE EXTRANEOUS																				
				Census Data															Areas (ha)		Flows (l/s)				Areas (ha)		Flows (l/s)																												
	FROM	TO		Singles & Semis (units)	Multiple Dwellings (units)	Apart (units)	Vacant	Popul. (peop.)	Metered Residential	Cumm. Popul. (peop.)	Cumm. Metered Residential (L/s)	Peaking Factor	Avg. Flow (l/s)	Popul. (peop.)	Cumm. Popul. (peop.)	Peaking Factor	Avg. Flow	Peak Res. Flow (l/s)	Commerc.	Industrial	mmerc./I	Industria	Peaking Factor	ICI Flow (l/s)	Commerc.	Industrial	Commerc.	Industria	Peaking Factor	ICI Flow (l/s)	Cumm. Peak ICI Flow (l/s)	Area (Ha)	Peak Extr Flow (l/s)	Cumm. Peak Extr. Flow (l/s)	Area (Ha)	Peak Extr. Flow (l/s)	Cumm. Peak Extr. Flow (l/s)	Pump Flow (l/s)	Total Peak Des. Flow (l/s)					DIA. (mm)	Actual Dia. (mm)	DESIGN SLOPE (%)	ACTUAL SLOPE (%)	CAPAC. (l/s)	VEL. (m/s)	LENGTH (m)					
	300	**290**	300-290	4.50		6.02		20.36		2706.0		3.48	10.96		0.0	3.48	0.00	38.15	0.79	0.00	0.26	0.00	1.50	0.383					1.500	0.000	27.608	0.79	0.221	38.937		0.000	0.000		104.694	50.371	155.065	84.87	27.649	500	508.00	0.160	0.215	182.714	0.901	49.27	59.70	59.204	59.61	59.098	DWGs did not have as-built lengths or slopes. Lengths were scaled from DWGs. Inverts & lengths were taken from JLR DWG 68-1130-05, Sewer Rehab.(PLAN & PROFILES)
ST. THERESE	295	290	295-290	7.88		6.02		29.20		29.2		4.00	0.12		0.0	4.00	0.00	0.47	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.14	0.318	0.318		0.000	0.000		0.791		0.791	14.49	4.669	200	203.20	-0.029	-0.025	5.460	0.168	78.54	59.83	59.630	59.85	59.650	Length and U/S invert are not as-built. Downstream Invert was taken from JLR DWG 68-1130-05, Sewer Rehab.(PLAN & PROFILES)
MONTCALM	**290**	**255**	290-255							2735.2		3.48	11.08		0.0	3.48	0.00	38.52	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	27.608	0.00	0.000	39.255		0.000	0.000		105.381	50.371	155.752	103.77	**-5.659**	500	508.00	0.160	0.145	150.093	0.741	98.50	59.60	59.098	59.46	58.955	Length and U/S invert are not as-built. D/S invert taken from prelim. DWG of St. Therese
CARTIER	285	280	285-280	2.25				5.89		5.9		4.00	0.02		0.0	4.00	0.00	0.10	0.60	0.00	0.19	0.00	1.50	0.292					1.500	0.000	0.292	0.60	0.168	0.168		0.000	0.000		0.556		0.556	2.52	21.540	200	203.20	0.413	0.417	22.096	0.681	49.16	62.91	62.710	62.71	62.505	
ST. JEAN	280	275	280-275	6.75				17.68		23.6		4.00	0.10		0.0	4.00	0.00	0.38	1.03	0.00	0.33	0.00	1.50	0.499					1.500	0.000	0.791	1.03	0.287	0.456		0.000	0.000		1.629		1.629	7.52	20.021	200	203.20	0.400	0.400	21.650	0.668	67.94	62.66	62.460	62.39	62.188	
	275	265	275-265							23.6		4.00	0.10		0.0	4.00	0.00	0.38	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.791	0.00	0.000	0.456		0.000	0.000		1.629		1.629	7.61	19.768	200	203.20	0.400	0.391	21.397	0.660	101.26	62.37	62.173	61.98	61.777	
DOLLARD	270	265	270-265	4.50	2.67	3.44		22.13		22.1		4.00	0.09		0.0	4.00	0.00	0.36	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.55	0.155	0.155		0.000	0.000		0.514		0.514	2.46	20.380	200	203.20	0.375	0.373	20.894	0.644	84.21	63.04	62.841	62.73	62.527	
ST. JEAN	265	260	265-260	7.88	2.67	26.68		64.05		109.8		4.00	0.44		0.0	4.00	0.00	1.78	1.36	0.00	0.44	0.00	1.50	0.659					1.500	0.000	1.450	1.36	0.380	0.991		0.000	0.000		4.219		4.219	19.37	17.565	200	203.20	0.400	0.405	21.785	0.672	75.98	61.98	61.777	61.67	61.469	
	260	255	260-255							109.8		4.00	0.44		0.0	4.00	0.00	1.78	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.450	0.00	0.000	0.991		0.000	0.000		4.219		4.219	7.01	56.012	200	203.20	1.760	3.099	60.232	1.857	79.68	61.67	61.469	59.20	59.000	Downstream Invert was taken from JLR DWG 68-1130-05, Sewer Rehab.(PLAN & PROFILES)
MONTCALM	255	90	255-90							2845.0		3.46	11.52		0.0	3.46	0.00	39.90	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	29.059	0.00	0.000	40.246		0.000	0.000		109.202	50.371	159.574	104.23	**-6.481**	500	508.00	0.160	0.151	153.093	0.755	105.93	59.43	58.930	59.28	58.770	DWGs did not have as-built lengths or slopes. Lengths were scaled from DWGs. Inverts & lengths were taken from JLR DWG 68-1130-05, Sewer Rehab.(PLAN & PROFILES)
ST. ISIDORE (EAST)	250	245	250-245	5.63		0.86		15.96		16.0		4.00	0.06		0.0	4.00	0.00	0.26	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	2.53	0.708	0.708		0.000	0.000		0.967		0.967	4.45	20.777	200	203.20	0.400	0.404	21.744	0.671	66.36	64.67	64.471	64.41	64.203	
	245	240	245-240							16.0		4.00	0.06		0.0	4.00	0.00	0.26	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.708		0.000	0.000		0.967		0.967	4.43	20.833	200	203.20	0.400	0.406	21.800	0.672	105.93	64.40	64.203	63.98	63.773	
	240	235	240-235							16.0		4.00	0.06		0.0	4.00	0.00	0.26	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.708		0.000	0.000		0.967		0.967	4.44	20.787	200	203.20	0.400	0.404	21.754	0.671	107.12	63.97	63.773	63.54	63.340	
	235	230A	235-230A							16.0		4.00	0.06		0.0	4.00	0.00	0.26	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.708		0.000	0.000		0.967		0.967	6.44	14.037	200	203.20	0.181	0.192	15.003	0.463	25.49	63.54	63.340	63.49	63.291	D/S invert might be incorrect. Length is not as-built and was scaled from DWG.
	230A	230	230A-230	7.88				20.63		36.6		4.00	0.15		0.0	4.00	0.00	0.59	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.84	0.515	1.223		0.000	0.000		1.816		1.816	7.74	21.649	200	203.20	0.480	0.470	23.465	0.724	80.38	63.49	63.292	63.12	62.914	U/S invert might be incorrect. Length is not as-built and was scaled from DWG.
	230	225	230-225							36.6		4.00	0.15		0.0	4.00	0.00	0.59	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	1.223		0.000	0.000		1.816		1.816	8.29	20.093	200	203.20	0.400	0.410	21.909	0.676	107.81	63.11	62.914	62.68	62.472	
	225	215	225-215	10.13				26.52		63.1		4.00	0.26		0.0	4.00	0.00	1.02	2.47	0.00	0.80	0.00	1.50	1.202					1.500	0.000	1.202	2.47	0.692	1.915		0.000	0.000		4.139		4.139	19.05	17.584	200	203.20	0.400	0.403	21.723	0.670	114.13	62.67	62.472	62.22	62.012	
BREBOEUF	220	215	220-215	9.01				23.57		23.6		4.00	0.10		0.0	4.00	0.00	0.38	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.86	0.241	0.241		0.000	0.000		0.623		0.623	2.98	20.294	200	203.20	0.375	0.374	20.917	0.645	88.04	62.56	62.359	62.23	62.030	
ST. ISIDORE (EAST)	215	205	215-205	3.38	8.00	2.58		28.84		115.5		4.00	0.47		0.0	4.00	0.00	1.87	0.74	0.00	0.24	0.00	1.50	0.359					1.500	0.000	1.560	0.74	0.207	2.363		0.000	0.000		5.795		5.795	27.97	14.925	200	203.20	0.400	0.367	20.720	0.639	109.90	62.21	62.012	61.81	61.609	
PRINCIPALE	210	205	210-205	1.13		3.44		7.85		7.8		4.00	0.03		0.0	4.00	0.00	0.13	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.32	0.090	0.090		0.000	0.000		0.217		0.217	0.96	22.302	200	203.20	0.422	0.433	22.519	0.694	51.95	62.19	61.987	61.97	61.762	
PRINCIPALE	205	165	205-165		2.67	7.75		16.47		139.8		4.00	0.57		0.0	4.00	0.00	2.27	2.38	0.00	0.77	0.00	1.50	1.155					1.500	0.000	2.715	2.38	0.665	3.118		0.000	0.000		8.099		8.099	37.63	13.426	200	203.20	0.401	0.396	21.525	0.664	51.55	61.75	61.548	61.55	61.344	
	201	33	201-33	4.50	18.67	6.02		58.45		58.5		4.00	0.24		0.0	4.00	0.00	0.95	2.44	0.00	0.79	0.00	1.50	1.187					1.500	0.000	1.187	2.44	0.684	0.684		0.000	0.000		2.818		2.818	13.92	17.425	200	203.20	0.000	0.350	20.243	0.624	108.10	63.91	63.714	63.54	63.336	
	33	200	33-200							58.5		4.00	0.24		0.0	4.00	0.00	0.95	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.187	0.00	0.000	0.684		0.000	0.000		2.818		2.818	13.92	17.425	200	203.20	0.000	0.350	20.243	0.624	9.13	63.54	63.336	63.51	63.304	
LAURIER	200	195	200-195	11.26	2.67			34.91		93.4		4.00	0.38		0.0	4.00	0.00	1.51	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.187	0.57	0.160	0.844		0.000	0.000		3.543		3.543	15.40	19.466	200	203.20	0.447	0.452	23.009	0.710	46.44	63.50	63.304	63.30	63.094	
	195	190	195-190	12.38		3.44		37.31		130.7		4.00	0.53		0.0	4.00	0.00	2.12	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.187	1.12	0.313	1.156		0.000	0.000		4.461		4.461	20.64	17.152	200	203.20	0.400	0.399	21.613	0.666	102.51	63.29	63.094	62.89	62.685	
	190	185	190-185	27.02	2.67			76.16		206.8		4.00	0.84		0.0	4.00	0.00	3.35	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.187	2.03	0.568	1.725		0.000	0.000		6.263		6.263	30.32	14.393	200	203.20	0.363	0.364	20.656	0.637	101.25	62.85	62.646	62.48	62.277	
	185	175	185-175							206.8		4.00	0.84		0.0	4.00	0.00	3.35	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.187	0.00	0.000	1.725		0.000	0.000		6.263		6.263	30.11	14.541	200	203.20	0.370	0.370	20.803	0.642	100.63	62.42	62.219	62.05	61.847	
BREBOEUF	180	175	180-175	3.38				8.84		8.8		4.00	0.04		0.0	4.00	0.00	0.14	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.42	0.118	0.118		0.000	0.000		0.262		0.262	0.95	27.208	200	203.20	0.623	0.644	27.469	0.847	94.65	63.69	63.493	63.09	62.883	
LAURIER	175	170	175-170	1.13		1.72		5.40		221.1		4.00	0.90		0.0	4.00	0.00	3.58	0.44	0.00	0.14	0.00	1.50	0.214					1.500	0.000	1.401	0.44	0.123	1.966		0.000	0.000		6.950		6.950	32.38	14.511	200	203.20	0.393	0.393	21.461	0.662	54.15	62.01	61.807	61.80	61.594	
	170	165	170-165							221.1		4.00	0.90		0.0	4.00	0.00	3.58	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.401	0.00	0.000	1.966		0.000	0.000		6.950		6.950	32.39	14.506	200	203.20	0.408	0.393	21.455	0.662	59.01	61.79	61.594	61.57	61.362	
PRINCIPALE	165	160	165-160							360.9		4.00	1.46		0.0	4.00	0.00	5.85	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	4.116	0.00	0.000	5.084		0.000	0.000		15.049		15.049	45.61	17.944	250	254.00	0.285	0.283	32.993	0.651	85.21	61.53	61.280	61.29	61.039	
	160	155	160-155							360.9		4.00	1.46		0.0	4.00	0.00	5.85	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	4.116	0.00	0.000	5.084		0.000	0.000		15.049		15.049	45.84	17.782	250	254.00	0.278	0.280	32.831	0.648	82.49	61.29	61.039	61.06	60.808	
	271	155	271-155							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	36.703	250	254.00	0.000	0.350	36.703	0.724	6.05	61.08	60.829	61.06	60.808	
	155	150	155-150							360.9		4.00	1.46		0.0	4.00	0.00	5.85	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	4.116	0.00	0.000	5.084		0.000	0.000		15.049		15.049	46.41	17.373	250	254.00	0.274	0.273	32.422	0.640	82.75	61.06	60.808	60.84	60.582	
	150	115	150-115							360.9		4.00	1.46		0.0	4.00	0.00	5.85	1.43	0.00	0.46	0.00	1.50	0.694					1.500	0.000	4.811	1.43	0.400	5.484		0.000	0.000		16.143		16.143	49.29	16.611	250	254.00	0.281	0.279	32.754	0.646	83.23	60.83	60.582	60.60	60.350	
BREBOEUF	145	140	145-140	10.13		6.02		35.10		35.1		4.00	0.14		0.0	4.00	0.00	0.57	2.19	0.00	0.71	0.00	1.50	1.063					1.500	0.000	1.063	2.19	0.612	0.612		0.000	0.000		2.244		2.244	10.64	18.837	200	203.20	0.384	0.380	21.081	0.650	71.39	64.33	64.127	64.06	63.856	
	140	125	140-125							35.1		4.00	0.14		0.0	4.00	0.00	0.57	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.063	0.00	0.000	0.612		0.000	0.000		2.244		2.244	10.61	18.898	200	203.20	0.376	0.382	21.141	0.652	55.27	64.06	63.856	63.85	63.645	
ARENA	135	130	135-130							0.0		4.00	0.00		0.0	4.00	0.00	0.00	1.27	0.00	0.41	0.00	1.50	0.619					1.500	0.000	0.619	1.27	0.357	0.357		0.000	0.000		0.976		0.976	3.92	23.946	200	203.20	0.395	0.530	24.922	0.768	49.39	63.17	62.972	62.91	62.710	
	130	125	130-125							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.619	0.00	0.000	0.357		0.000	0.000		0.976		0.976	4.54	20.515	200	203.20	0.391	0.395	21.491	0.663	75.54	62.90	62.703	62.61	62.405	
BREBOEUF	125	120	125-120							35.1		4.00	0.14		0.0	4.00	0.00	0.57	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.682	0.00	0.000	0.969		0.000	0.000		3.220		3.220	15.39	17.699	200	203.20	0.386	0.374	20.918	0.645	42.27	62.57	62.368	62.41	62.210	
	49	48	49-48							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	20.243	200	203.20	0.440	0.350	20.243	0.624	101.40	63.04	62.844	62.69	62.489	
	48	46	48-46							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	20.243	200	203.20	0.350	0.350	20.243	0.624	41.45	62.69	62.489	62.55	62.344	
	46	52	46-52	4.50				11.79		11.8		4.00	0.05		0.0	4.00	0.00	0.19	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.22	0.061	0.061		0.000	0.000		0.252		0.252	1.24	19.991	200	203.20	0.350	0.350	20.243	0.624	35.96	62.54	62.344	62.42	62.219	
	52	120	52-120							11.8		4.00	0.05		0.0	4.00	0.00	0.19	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.061		0.000	0.000		0.252		0.252	1.24	19.991	200	203.20	0.350	0.350	20.243	0.624	13.00	62.42	62.219	62.38	62.173	
DOLLARD	120	115	120-115	4.50				11.79		58.7		4.00	0.24		0.0	4.00	0.00	0.95	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.682	0.51	0.144	1.173		0.000	0.000		3.806		3.806	17.53	17.902	200	203.20	0.399	0.403	21.708	0.669	100.62	62.37	62.173	61.97	61.768	
PRINCIPALE	115	110	115-110	9.01	2.67	39.59		85.38		505.0		3.97	2.05		0.0	3.97	0.00	8.12	1.43	1.26	0.46	0.51	1.50	1.458					1.500	0.000	7.951	2.68	0.752	7.409		0.000	0.000		23.485		23.485	43.78	30.155	300	304.80	0.283	0.283	53.640	0.735	77.82	60.61	60.305	60.39	60.085	
	110	90	110-90							505.0		3.97	2.05		0.0	3.97	0.00	8.12	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	7.951	0.00	0.000	7.409		0.000	0.000		23.485		23.485	41.37	33.288	300	304.80	0.280	0.317	56.773	0.778	74.20	60.39	60.085	60.15	59.850	Downstream Invert was taken from JLR DWG 68-1130-05, Sewer Rehab.(PLAN & PROFILES)
BREBOEUF	105	100	105-100	1.13		17.21		27.45		27.5		4.00	0.11		0.0	4.00	0.00	0.44	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.57	0.161	0.161		0.000	0.000		0.605		0.605	2.90	20.265	200	203.20	0.400	0.372	20.870	0.644	71.50	62.72	62.521	62.46	62.255	
BREBOEUF	47	54	47-54							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	20.243	200	203.20	0.000	0.350	20.243	0.624	55.66	62.79	62.586	62.59	62.391	
BREBOEUF	54	100	54-100							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	20.243	200	203.20	0.000	0.350	20.243	0.624	42.40	62.59	62.391	62.45	62.243	
	100	95	100-95							27.5		4.00	0.11		0.0	4.00	0.00	0.44	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.161		0.000	0.000		0.605		0.605	2.90	20.299	200	203.20	0.400	0.373	20.905	0.645	62.69	62.44	62.243	62.21	62.009	
MONTCALM	95	90	95-90	11.26	2.67			34.91		62.4		4.00	0.25		0.0	4.00	0.00	1.01	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.70	0.196	0.357		0.000	0.000		1.367		1.367	1.24	108.719	250	254.00	3.150	3.149	110.086	2.173	102.55	62.26	62.009	59.03	58.780	No upstream invert on as-built for this run. Run includes flow from new St. Euphemie , Downstream Invert was taken from JLR DWG 68-1130-05, Sewer Rehab.(PLAN & PROFILES)
PRINCIPALE	90	85	90-85	2.25				5.89		3418.2		3.39	13.85		0.0	3.39	0.00	46.99	1.84	0.00	0.60	0.00	1.50	0.893					1.500	0.000	37.902	1.84	0.514	48.526		0.000	0.000		133.419	50.371	183.791	83.36	36.683	500	508.00	0.316	0.313	220.474	1.088	38.31	59.29	58.790	59.18	58.670	DWGs did not have as-built lengths or slopes. Lengths were scaled from DWGs. Inverts & lengths were taken from JLR DWG 68-1130-05, Sewer Rehab.(PLAN & PROFILES)
	85	83	85-83							3418.2		3.39	13.85		0.0	3.39	0.00	46.99	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	37.902	0.00	0.000	48.526		0.000	0.000		133.419	50.371	183.791	76.45	56.614	525	533.40	0.300	0.287	240.405	1.076	73.14	59.18	58.650	58.97	58.440	
	84	83	84-83	10.13	13.33	6.02		62.30		62.3		4.00	0.25		0.0	4.00	0.00	1.01	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.92	0.258	0.258		0.000	0.000		1.268		1.268	3.72	32.812	250	254.00	0.300	0.302	34.080	0.673	26.51	60.60	60.350	60.52	60.270	DWGs did not have as-built lengths or slopes. Lengths were scaled from DWGs. Inverts & lengths were taken from JLR DWG 68-1130-05, Sewer Rehab.(PLAN & PROFILES)
	83	316	83-316							3480.5		3.39	14.10		0.0	3.39	0.00	47.75	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	37.902	0.00	0.000	48.784		0.000	0.000		134.437	50.371	184.809	73.07	68.124	525	533.40	0.300	0.318	252.933	1.132	56.64	58.97	58.440	58.79	58.260	
	316	80	316-80							3480.5		3.39	14.10		0.0	3.39	0.00	47.75	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	37.902	0.00	0.000	48.784		0.000	0.000		134.437	50.371	184.809	69.63	80.620	525	533.40	0.300	0.350	265.429	1.188	5.81	57.22	56.697	57.21	56.677	
	80	317	80-317							3480.5		3.39	14.10		0.0	3.39	0.00	47.75	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	37.902	0.00	0.000	48.784		0.000	0.000		134.437	50.371	184.809	**96.60**	6.513	525	533.40	0.300	0.182	191.322	0.856	16.50	57.20	56.677	57.18	56.647	
	317	318	317-318							3480.5		3.39	14.10		0.0	3.39	0.00	47.75	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	37.902	0.00	0.000	48.784		0.000	0.000		134.437	50.371	184.809	73.15	67.832	525	533.40	0.300	0.317	252.641	1.131	12.61	57.17	56.640	57.13	56.600	
	458	457	458-457							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	88.749	375	381.00	0.190	0.235	88.749	0.778	93.45	60.61	60.230	60.39	60.010	
	457	4550	457-4550							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	143.243	375	381.00	0.190	0.613	143.243	1.256	115.77	60.90	60.520	60.19	59.810	
	464	461	464-461							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	24.433	200	203.20	0.800	0.510	24.433	0.753	78.44	63.20	63.000	62.80	62.600	
	461	466	461-466							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	17.996	200	203.20	0.320	0.277	17.996	0.555	79.53	62.78	62.580	62.56	62.360	
	466	459	466-459							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	18.031	200	203.20	0.320	0.278	18.031	0.556	79.23	62.54	62.340	62.32	62.120	
	459	4550	459-4550							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	18.017	200	203.20	0.320	0.277	18.017	0.556	64.92	62.29	62.090	62.11	61.910	
	4550	456	4550-456							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	77.063	375	381.00	0.190	0.178	77.063	0.676	90.14	60.17	59.790	60.01	59.630	
	462	463	462-463							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	24.617	200	203.20	0.600	0.518	24.617	0.759	102.40	62.50	62.300	61.97	61.770	
	463	456	463-456							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	19.818	200	203.20	0.400	0.335	19.818	0.611	56.64	61.98	61.780	61.79	61.590	
	456	454	456-454							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	85.850	375	381.00	0.240	0.220	85.850	0.753	90.79	59.99	59.610	59.79	59.410	
	454	453	454-453							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	92.384	450	457.20	0.110	0.096	92.384	0.563	72.56	59.84	59.390	59.78	59.320	
	453	452	453-452							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	122.094	450	457.20	0.110	0.169	122.094	0.744	70.62	59.78	59.329	59.67	59.210	
	452	451	452-451							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	55.862	450	457.20	0.110	0.035	55.862	0.340	85.05	57.86	57.410	57.84	57.380	
	451	4500	451-4500							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	108.799	450	457.20	0.110	0.134	108.799	0.663	14.95	57.81	57.360	57.80	57.340	
	4500	449	4500-449							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	97.374	450	457.20	0.110	0.107	97.374	0.593	27.99	57.76	57.310	57.74	57.280	
	449	448	449-448							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	97.049	450	457.20	0.110	0.106	97.049	0.591	103.32	57.70	57.250	57.60	57.140	
	448	447	448-447							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	96.980	450	457.20	0.110	0.106	96.980	0.591	103.47	57.57	57.120	57.47	57.010	
	447	446	447-446							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	242.291	450	457.20	0.110	0.664	242.291	1.476	12.06	57.46	57.010	57.39	56.930	
	446	471	446-471							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	148.790	450	457.20	0.170	0.250	148.790	0.906	15.98	57.35	56.900	57.32	56.860	
	471	318	471-318							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	189.347	450	457.20	1.720	0.405	189.347	1.153	4.94	57.25	56.800	57.24	56.780	

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

VILLAGE OF CASSELMAN: SANITARY SEWER AND WATER MASTER PLAN
JLR No. 16953-119

Future Sanitary Sewer System - September 2023 (Existing Conditions)

SANITARY SEWER DESIGN SHEET

Design Constants/Coefficients

Manning's "n" =	0.013	
Infilt. Allowance =	0.28	L/s/ha
Residential Flow =	350	L/cap/d
Commercial/Institutional Flow Rate =	28000	L/gross ha/d
Industrial Flow Rate =	35000	L/gross ha/d

Unless otherwise indicated, Manning's 'n' is assumed to be 0.013

Population Data (Existing)

Total Number of Units:	1695
Census Existing Population:	4048
Population Calibration Factor:	0.791
Computed Population:	4048
Harmon Equation Correction Factor:	1.0
Weighted Coefficients	
Singles & Semi-Detached:	2.62
Multiple Dwellings:	2.04
Apartments:	1.42
ICI peaking factor:	1.50
PPU:	2.39

Population Data (New Subdivision)

Single Family:	3.4	persons/unit
Townhouse:	2.7	persons/unit
Semi-detached:	2.70	persons/unit
Apartments:	1.80	persons/unit
Duplex:	2.30	persons/unit
Res. Flow:	350	L/cap/d
Infilt. Allowance:	0.28	L/ha/s

🟧	Downstream Runs
🟩	If population changes, please change value in this cell

Prepared by: M.L.
Checked by: B.P.

STREET	MANHOLE NUMBER FROM	MANHOLE NUMBER TO	FROM MH - TO MH	EXISTING RESIDENTIAL AREA Census Data Singles & Semis (units)	Census Data Multiple Dwellings (units)	Census Data Apart (units)	Census Data Vacant	Popul. (peop.)	Metered Residential	Cumm. Popul. (peop.)	Cumm. Metered Residential (L/s)	Peaking Factor	Avg. Flow (l/s)	FUTURE RESIDENTIAL Popul. (peop.)	Cumm. Popul. (peop.)	Peaking Factor	Avg. Flow	Peak Res. Flow (l/s)	EXISTING ICI Areas (ha) Commerc.	EXISTING ICI Areas (ha) Industrial	EXISTING ICI Flows (l/s) Commerc./Inst.	EXISTING ICI Flows (l/s) Industrial	Peaking Factor	ICI Flow (l/s)	FUTURE ICI Areas (ha) Commerc.	FUTURE ICI Areas (ha) Industrial	FUTURE ICI Flows (l/s) Commerc.	FUTURE ICI Flows (l/s) Industrial	Peaking Factor	ICI Flow (l/s)	Cumm. Peak ICI Flow (l/s)	EXISTING EXTRANEOUS Area (Ha)	Peak Extr Flow (l/s)	Cumm. Peak Extr. Flow (l/s)	FUTURE EXTRANEOUS Area (Ha)	Peak Extr. Flow (l/s)	Cumm. Peak Extr. Flow (l/s)	Pump Flow (l/s)	Total Peak Des. Flow (l/s)	Pump Correction Factor (l/s)	Total Peak Des. Flow with pump (l/s)	Q_d/Q_{full} %	Residual Capacity (l/s)	SEWER DATA DIA. (mm)	Actual Dia. (mm)	DESIGN SLOPE (%)	ACTUAL SLOPE (%)	CAPAC. (l/s)	VEL. (m/s)	LENGTH (m)	Upstream Obvert (m)	Upstream Invert (m)	Downstream Obvert (m)	Downstream (m)	Comments
	318	PS1	318-PS1							3480.5		3.39	14.10		0.0	3.39	0.00	47.75	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	37.902	0.00	0.000	48.784		0.000	0.000		134.437	50.371	184.809	182.15	-83.349	525	533.40	0.300	0.051	101.460	0.454	11.73	57.10	56.570	57.10	56.564	
	1320	1330	1320-1330	6.75				17.68		17.7		4.00	0.07		0.0	4.00	0.00	0.29	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.54	0.433	0.433		0.000	0.000		0.719		0.719	3.65	18.959	200	203.20	0.345	0.331	19.678	0.607	23.58	63.18	62.979	63.10	62.901	
	1675	1680	1675-1680							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	27.138	200	203.20	0.650	0.629	27.138	0.837	63.59	63.93	63.730	63.53	63.330	
	1680	1685	1680-1685							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	18.755	200	203.20	0.320	0.300	18.755	0.578	13.31	63.53	63.330	63.49	63.290	
	1685	1690	1685-1690							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	19.023	200	203.20	0.320	0.309	19.023	0.587	113.23	63.49	63.290	63.14	62.940	
	1690	1330	1690-1330							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	18.299	200	203.20	0.320	0.286	18.299	0.564	13.98	63.14	62.940	63.10	62.900	
	1330	1340	1330-1340							17.7		4.00	0.07		0.0	4.00	0.00	0.29	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.433		0.000	0.000		0.719		0.719	3.52	19.692	200	203.20	0.353	0.356	20.411	0.629	110.16	63.10	62.899	62.71	62.507	
	1340	1350	1340-1350	6.75				17.68		35.4		4.00	0.14		0.0	4.00	0.00	0.57	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.35	0.379	0.811		0.000	0.000		1.384		1.384	6.90	18.666	200	203.20	0.347	0.343	20.050	0.618	121.15	62.69	62.488	62.28	62.072	
	1605	1610	1605-1610							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	19.161	200	203.20	0.320	0.314	19.161	0.591	79.72	63.65	63.450	63.40	63.200	
	1610	1615	1610-1615							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	19.071	200	203.20	0.320	0.311	19.071	0.588	64.38	63.40	63.200	63.20	63.000	
	1615	1620	1615-1620							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	18.828	200	203.20	0.320	0.303	18.828	0.581	16.51	63.20	63.000	63.15	62.950	
	1620	1625	1620-1625							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	18.845	200	203.20	0.320	0.303	18.845	0.581	36.26	63.15	62.950	63.04	62.840	
	1625	1630	1625-1630							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	18.716	200	203.20	0.320	0.299	18.716	0.577	36.76	63.04	62.840	62.93	62.730	
	1630	1635	1630-1635							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	19.310	200	203.20	0.320	0.318	19.310	0.595	34.54	62.93	62.730	62.82	62.620	
	1635	1640	1635-1640							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	28.133	200	203.20	0.690	0.676	28.133	0.868	34.02	62.82	62.620	62.59	62.390	
	1655	1660	1655-1660							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	27.011	200	203.20	0.650	0.623	27.011	0.833	35.30	63.34	63.140	63.12	62.920	
	1660	1665	1660-1665							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	18.617	200	203.20	0.320	0.296	18.617	0.574	13.51	63.12	62.920	63.08	62.880	
	1665	1670	1665-1670							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	19.429	200	203.20	0.320	0.322	19.429	0.599	77.54	63.08	62.880	62.83	62.630	
	1670	1640	1670-1640							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	19.420	200	203.20	0.320	0.322	19.420	0.599	74.50	62.83	62.630	62.59	62.390	
	1640	1645	1640-1645							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	19.186	200	203.20	0.320	0.314	19.186	0.592	28.63	62.55	62.350	62.46	62.260	
	1645	1650	1645-1650							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	19.300	200	203.20	0.320	0.318	19.300	0.595	31.43	62.46	62.260	62.36	62.160	
	1650	1350	1650-1350							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	20.262	200	203.20	0.350	0.351	20.262	0.625	28.52	62.36	62.160	62.26	62.060	
	1350	1360	1350-1360	2.25				5.89		41.3		4.00	0.17		0.0	4.00	0.00	0.67	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.32	0.091	0.902		0.000	0.000		1.570		1.570	7.18	20.289	200	203.20	0.350	0.408	21.859	0.674	17.15	62.25	62.048	62.18	61.978	From 16953-81 as-builts, residential peaking factor not adjusted as seen in the rest of the sheet
	1360	1370	1360-1370							41.3		4.00	0.17		0.0	4.00	0.00	0.67	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.902		0.000	0.000		1.570		1.570	8.93	16.015	200	203.20	0.306	0.264	17.585	0.542	37.48	62.16	61.960	62.06	61.861	From 16953-81 as-builts, residential peaking factor not adjusted as seen in the rest of the sheet
	1370	1380	1370-1380							41.3		4.00	0.17		0.0	4.00	0.00	0.67	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.902		0.000	0.000		1.570		1.570	7.65	18.948	200	203.20	0.170	0.360	20.518	0.633	8.62	62.04	61.835	62.01	61.804	From 16953-81 as-builts, residential peaking factor not adjusted as seen in the rest of the sheet
	1300	1310	1300-1310							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	20.653	200	203.20	0.358	0.364	20.653	0.637	52.70	62.42	62.223	62.23	62.031	From 16953-81 as-builts, residential peaking factor not adjusted as seen in the rest of the sheet
	1310	1380	1310-1380							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	21.357	200	203.20	0.306	0.390	21.357	0.659	56.21	62.23	62.031	62.02	61.812	From 16953-81 as-builts, residential peaking factor not adjusted as seen in the rest of the sheet
PRINCIPALE	1380	1390	1380-1390							41.3		4.00	0.17		0.0	4.00	0.00	0.67	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.902		0.000	0.000		1.570		1.570	8.57	16.755	200	203.20	0.346	0.287	18.326	0.565	83.67	61.99	61.788	61.75	61.548	From 16953-81 as-builts, residential peaking factor not adjusted as seen in the rest of the sheet
	1390	1400	1390-1400	2.25				5.89		47.1		4.00	0.19		0.0	4.00	0.00	0.76	1.30	0.00	0.42	0.00	1.50	0.632					1.500	0.000	0.632	1.30	0.364	1.266		0.000	0.000		2.661		2.661	12.55	18.540	200	203.20	0.370	0.384	21.201	0.654	69.55	61.71	61.505	61.44	61.238	From 16953-81 as-builts, residential peaking factor not adjusted as seen in the rest of the sheet
	1700	1705	1700-1705	22.51				58.93		58.9		4.00	0.24		0.0	4.00	0.00	0.95	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	3.49	0.978	0.978		0.000	0.000		1.933		1.933	7.14	25.135	200	203.20	0.611	0.626	27.068	0.835	116.97	63.21	63.007	62.48	62.275	
	1705	1710	1705-1710							58.9		4.00	0.24		0.0	4.00	0.00	0.95	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.978		0.000	0.000		1.933		1.933	9.48	18.466	200	203.20	0.347	0.355	20.398	0.629	65.84	62.43	62.234	62.20	62.000	
	1710	1715	1710-1715							58.9		4.00	0.24		0.0	4.00	0.00	0.95	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.978		0.000	0.000		1.933		1.933	9.40	18.624	200	203.20	0.355	0.361	20.556	0.634	66.77	62.17	61.967	61.93	61.726	
	1715	1400	1715-1400							58.9		4.00	0.24		0.0	4.00	0.00	0.95	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.978		0.000	0.000		1.933		1.933	7.06	25.434	200	203.20	0.590	0.640	27.367	0.844	15.48	61.93	61.726	61.83	61.627	
	1400	1410	1400-1410	1.13				2.95		109.0		4.00	0.44		0.0	4.00	0.00	1.77	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.632	2.47	0.691	2.935		0.000	0.000		5.333		5.333	12.98	35.763	300	304.80	0.167	0.166	41.096	0.563	69.30	61.44	61.135	61.32	61.020	From 16953-81 as-builts, residential peaking factor not adjusted as seen in the rest of the sheet
	1410	1420	1410-1420	1.13				2.95		112.0		4.00	0.45		0.0	4.00	0.00	1.81	1.17	0.00	0.38	0.00	1.50	0.568					1.500	0.000	1.200	1.17	0.327	3.262		0.000	0.000		6.276		6.276	16.11	32.671	300	304.80	0.144	0.149	38.948	0.534	69.10	61.32	61.020	61.22	60.917	From 16953-81 as-builts, residential peaking factor not adjusted as seen in the rest of the sheet
	1720	1725	1720-1725	18.01				47.15		47.1		4.00	0.19		0.0	4.00	0.00	0.76	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	2.78	0.780	0.780		0.000	0.000		1.544		1.544	7.33	19.528	200	203.20	0.365	0.379	21.072	0.650	91.76	63.72	63.521	63.38	63.173	
	1725	1730	1725-1730							47.1		4.00	0.19		0.0	4.00	0.00	0.76	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.780		0.000	0.000		1.544		1.544	7.77	18.331	200	203.20	0.347	0.337	19.875	0.613	113.22	63.32	63.121	62.94	62.739	
	1730	1420	1730-1420							47.1		4.00	0.19		0.0	4.00	0.00	0.76	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.780		0.000	0.000		1.544		1.544	5.79	25.101	200	203.20	0.590	0.606	26.645	0.822	14.51	62.93	62.729	62.84	62.641	
	1420	1430	1420-1430							159.1		4.00	0.64		0.0	4.00	0.00	2.58	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.200	0.00	0.000	4.042		0.000	0.000		7.820		7.820	18.28	34.954	300	304.80	0.177	0.180	42.774	0.586	63.41	61.22	60.917	61.11	60.803	From 16953-81 as-builts, residential peaking factor not adjusted as seen in the rest of the sheet
	1430	1440	1430-1440	4.50				11.79		170.9		4.00	0.69		0.0	4.00	0.00	2.77	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.200	3.45	0.966	5.008		0.000	0.000		8.977		8.977	20.89	33.989	300	304.80	0.177	0.181	42.965	0.589	62.85	61.22	60.917	61.11	60.803	From 16953-81 as-builts, residential peaking factor not adjusted as seen in the rest of the sheet
	1755	1750	1755-1750	5.63				14.73		14.7		4.00	0.06		0.0	4.00	0.00	0.24	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.90	0.253	0.253		0.000	0.000		0.492		0.492	1.72	28.083	200	203.20	0.650	0.697	28.574	0.881	49.47	63.86	63.657	63.52	63.312	
	1750	1745	1750-1745							14.7		4.00	0.06		0.0	4.00	0.00	0.24	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.253		0.000	0.000		0.492		0.492	1.92	25.091	200	203.20	0.517	0.559	25.582	0.789	10.38	63.48	63.275	63.42	63.217	
	1745	1740	1745-1740	10.13				26.52		41.3		4.00	0.17		0.0	4.00	0.00	0.67	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.44	0.404	0.657		0.000	0.000		1.326		1.326	10.99	10.742	150	152.40	0.650	0.577	12.068	0.662	85.45	63.32	63.169	62.83	62.676	
	1740	1735	1740-1735							41.3		4.00	0.17		0.0	4.00	0.00	0.67	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.657		0.000	0.000		1.326		1.326	6.50	19.078	200	203.20	0.347	0.356	20.404	0.629	85.49	62.83	62.627	62.53	62.323	
	1735	1440	1735-1440							41.3		4.00	0.17		0.0	4.00	0.00	0.67	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.657		0.000	0.000		1.326		1.326	5.52	22.680	200	203.20	0.493	0.492	24.006	0.740	16.25	62.50	62.300	62.42	62.220	
	1440	1450	1440-1450	2.25				5.89		218.0		4.00	0.88		0.0	4.00	0.00	3.53	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.200	0.56	0.156	5.821		0.000	0.000		10.554		10.554	22.98	35.370	300	304.80	0.203	0.207	45.923	0.629	56.94	60.93	60.633	60.82	60.515	From 16953-81 as-builts, residential peaking factor not adjusted as seen in the rest of the sheet
Area C	1450	1460	1450-1460	4.50				11.79		229.8		4.00	0.93		0.0	4.00	0.00	3.72	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.200	0.94	0.264	6.085		0.000	0.000		11.009		11.009	25.50	32.161	300	304.80	0.177	0.183	43.170	0.592	94.47	60.81	60.507	60.64	60.334	From 16953-81 as-builts, residential peaking factor not adjusted as seen in the rest of the sheet
	1755	1760	1755-1760							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	30.836	200	203.20	0.800	0.812	30.836	0.951	54.30	63.80	63.599	63.36	63.158	
	1760	1765	1760-1765							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.000		0.000	0.000		0.000		0.000	0.00	22.753	200	203.20	0.530	0.442	22.753	0.702	13.57	63.33	63.125	63.27	63.065	
	1765	1770	1765-1770	6.75				17.68		17.7		4.00	0.07		0.0	4.00	0.00	0.29	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.01	0.283	0.283		0.000	0.000		0.570		0.570	2.05	27.169	200	203.20	0.643	0.657	27.739	0.855	67.40	63.23	63.030	62.79	62.587	
	1770	1775	1770-1775							17.7		4.00	0.07		0.0	4.00	0.00	0.29	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.283		0.000	0.000		0.570		0.570	2.41	23.048	200	203.20	0.466	0.476	23.618	0.728	19.31	62.77	62.567	62.68	62.475	
	1775	1460	1775-1460	3.38				8.84		26.5		4.00	0.11		0.0	4.00	0.00	0.43	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.32	0.091	0.374		0.000	0.000		0.804		0.804	4.10	18.820	200	203.20	0.324	0.329	19.624	0.605	48.95	62.66	62.456	62.50	62.295	
	1460	1470	1460-1470	9.01				23.57		279.9		4.00	1.13		0.0	4.00	0.00	4.54	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.200	1.60	0.449	6.908		0.000	0.000		12.644		12.644	26.66	34.776	300	304.80	0.217	0.221	47.420	0.650	117.22	60.63	60.330	60.38	60.071	From 16953-81 as-builts, residential peaking factor not adjusted as seen in the rest of the sheet
	1470	1480	1470-1480	9.01				23.57		303.5		4.00	1.23		0.0	4.00	0.00	4.92	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.200	2.17	0.608	7.516		0.000	0.000		13.633		13.633	29.50	32.576	300	304.80	0.206	0.210	46.209	0.633	117.25	60.37	60.071	60.13	59.825	From 16953-81 as-builts, residential peaking factor not adjusted as seen in the rest of the sheet
	1480	1480A	1480-1480A	2.25			1.00	5.89		309.4		4.00	1.25		0.0	4.00	0.00	5.01	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.200	2.12	0.594	8.109		0.000	0.000		14.322		14.322	33.00	29.077	300	304.80	0.200	0.185	43.400	0.595	106.98	60.11	59.811	59.92	59.613	From 16953-81 as-builts, residential peaking factor not adjusted as seen in the rest of the sheet
	1480A	1490	1480A-1490	3.38				8.84		318.2		4.00	1.29		0.0	4.00	0.00	5.16	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.200	0.95	0.267	8.376		0.000	0.000		14.733		14.733	34.97	27.397	300	304.80	0.180	0.174	42.129	0.577	87.73	59.89	59.588	59.74	59.435	
	2070	2065	2070-2065	4.50				11.79		11.8		4.00	0.05		0.0	4.00	0.00	0.19	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	3.88	1.087	1.087		0.000	0.000		1.278		1.278	4.98	24.377	200	203.20	0.653	0.562	25.655	0.791	16.72	63.77	63.569	63.68	63.475	
	2065	2060	2065-2060							11.8		4.00	0.05		0.0	4.00	0.00	0.19	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	1.087		0.000	0.000		1.278		1.278	3.09	40.095	200	203.20	1.410	1.462	41.373	1.276	111.22	63.64	63.440	62.02	61.814	
	2060	2055	2060-2055	2.25				5.89		17.7		4.00	0.07		0.0	4.00	0.00	0.29	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	3.16	0.884	1.971		0.000	0.000		2.258		2.258	5.93	35.793	200	203.20	1.380	1.237	38.050	1.173	23.77	61.97	61.771	61.68	61.477	
	2055	2050	2055-2050							17.7		4.00	0.07		0.0	4.00	0.00	0.29	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	1.971		0.000	0.000		2.258		2.258	5.36	39.875	200	203.20	1.430	1.516	42.132	1.299	36.60	61.62	61.419	61.07	60.864	
	2050	2045	2050-2045							17.7		4.00	0.07		0.0	4.00	0.00	0.29	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	1.971		0.000	0.000		2.258		2.258	5.53	38.569	200	203.20	1.370	1.424	40.826	1.259	21.70	61.04	60.838	60.73	60.529	
	2045	2040	2045-2040							17.7		4.00	0.07		0.0	4.00	0.00	0.29	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	1.971		0.000	0.000		2.258		2.258	6.04	35.143	200	203.20	1.030	1.195	37.401	1.153	28.88	60.69	60.493	60.35	60.148	
	2040	2035	2040-2035							17.7		4.00	0.07		0.0	4.00	0.00	0.29	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	1.971		0.000	0.000		2.258		2.258	7.51	27.788	200	203.20	0.900	0.771	30.046	0.926	19.45	60.29	60.092	60.15	59.942	
	2035	2030	2035-2030							17.7		4.00	0.07		0.0	4.00	0.00	0.29	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	1.971		0.000	0.000		2.258		2.258	11.41	17.533	200	203.20	0.318	0.335	19.791	0.610	41.25	60.09	59.887	59.95	59.749	
	2030	1500	2030-1500							17.7		4.00	0.07		0.0	4.00	0.00	0.29	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	1.971		0.000	0.000		2.258		2.258	8.97	22.903	200	203.20	0.508	0.541	25.161	0.776	23.49	59.88	59.677	59.75	59.550	
	1500	1490	1500-1490							17.7		4.00	0.07		0.0	4.00	0.00	0.29	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	1.971		0.000	0.000		2.258		2.258	4.22	51.219	300	304.80	0.340	-0.281	53.476	0.733	12.81	59.73	59.432	59.77	59.468	
	1490	1520	1490-1520				1.00			335.9		4.00	1.36		0.0	4.00	0.00	5.44	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	1.200	0.47	0.132	10.480		0.000	0.000		17.122		17.122	9.73	158.842	450	457.20	0.500	0.350	175.964	1.072	21.54	59.37	58.915	59.30	58.840	
	1780	1785	1780-1785	2.25			16.00	5.89		5.9		4.00	0.02		0.0	4.00	0.00	0.10	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.33	0.373	0.373		0.000	0.000		0.469		0.469	2.41	18.975	200	203.20	0.320	0.323	19.444	0.600	55.74	63.50	63.300	63.32	63.120	
	1785	1790	1785-1790							5.9		4.00	0.02		0.0	4.00	0.00	0.10	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.373		0.000	0.000		0.469		0.469	2.41	19.000	200	203.20	0.320	0.324	19.469	0.600	98.84	63.29	63.090	62.97	62.770	
	1790	1795	1790-1795	2.25			11.00	5.89		11.8		4.00	0.05		0.0	4.00	0.00	0.19	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.22	0.342	0.715		0.000	0.000		0.906		0.906	4.69	18.416	200	203.20	0.320	0.319	19.322	0.596	62.72	62.94	62.740	62.74	62.540	
	1795	1800	1795-1800							11.8		4.00	0.05		0.0	4.00	0.00	0.19	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.715		0.000	0.000		0.906		0.906	4.73	18.270	200	203.20	0.310	0.314	19.176	0.591	44.58	62.71	62.510	62.57	62.370	
	1800	1805	1800-1805							11.8		4.00	0.05		0.0	4.00	0.00	0.19	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.715		0.000	0.000		0.906		0.906	4.70	18.366	200	203.20	0.320	0.317	19.273	0.594	40.98	62.54	62.340	62.41	62.210	
	1805	1810	1805-1810	10.13			8.00	26.52		38.3		4.00	0.16		0.0	4.00	0.00	0.62	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.19	0.333	1.048		0.000	0.000		1.669		1.669	8.74	17.435	200	203.20	0.320	0.312	19.104	0.589	41.06	62.38	62.180	62.26	62.052	
	1810	1815	1810-1815							38.3		4.00	0.16		0.0	4.00	0.00	0.62	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	1.048		0.000	0.000		1.669		1.669	8.60	17.742	200	203.20	0.370	0.322	19.410	0.599	96.33	62.25	62.050	61.94	61.740	
	1815	1820	1815-1820				2.00			38.3		4.00	0.16		0.0	4.00	0.00	0.62	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	1.048		0.000	0.000		1.669		1.669	8.68	17.556	200	203.20	0.310	0.316	19.225	0.593	44.35	61.94	61.740	61.80	61.600	
	1825	1820	1825-1820	1.13			2.00	2.95		2.9		4.00	0.01		0.0	4.00	0.00	0.05	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.30	0.085	0.085		0.000	0.000		0.132		0.132	0.68	19.315	200	203.20	0.320	0.323	19.447	0.600	40.25	63.25	63.050	63.12	62.920	
	1820	1830	1820-1830							41.3		4.00	0.17		0.0	4.00	0.00	0.67	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	1.133		0.000	0.000		1.801		1.801	11.03	14.529	200	203.20	0.240	0.228	16.330	0.504	48.29	61.39	61.190	61.28	61.080	
	1830	1835	1830-1835							41.3		4.00	0.17		0.0	4.00	0.00	0.67	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	1.133		0.000	0.000		1.801		1.801	10.78	14.903	200	203.20	0.240	0.238	16.704	0.515	16.78	61.22	61.020	61.18	60.980	
	1835	1840	1835-1840							41.3		4.00	0.17		0.0	4.00	0.00	0.67	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	1.133		0.000	0.000		1.801		1.801	5.77	29.392	250	254.00	0.250	0.253	31.194	0.616	67.24	61.17	60.920	61.00	60.750	
	1840	1845	1840-1845							41.3		4.00	0.17		0.0	4.00	0.00	0.67	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	1.133		0.000	0.000		1.801		1.801	5.93	28.551	250	254.00	0.240	0.239	30.352	0.599	41.78	61.00	60.750	60.90	60.650	
	1995	2000	1995-2000							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.34	0.374	0.374		0.000	0.000		0.374		0.374	0.66	56.365	250	254.00	0.840	0.836	56.740	1.120	43.04	63.01	62.760	62.65	62.400	
	2000	2005	2000-2005							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.374		0.000	0.000		0.374		0.374	0.78	47.532	250	254.00	0.600	0.596	47.906	0.945	38.57	62.65	62.400	62.42	62.170	
	2005	1845	2005-1845							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.374		0.000	0.000		0.374		0.374	0.78	47.743	250	254.00	0.600	0.602	48.118	0.950	51.53	62.39	62.140	62.08	61.830	
	2025	2020	2025-2020							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.77	0.495	0.495		0.000	0.000		0.495		0.495	0.60	82.521	250	254.00	0.420	-1.791	83.016	1.638	33.51	63.00	62.750	63.60	63.350	
	2020	2015	2020-2015							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.495		0.000	0.000		0.495		0.495	1.05	46.770	250	254.00	0.580	0.580	47.265	0.933	89.59	63.57	63.320	63.05	62.800	
	2015	2010	2015-2010							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.495		0.000	0.000		0.495		0.495	1.03	47.551	250	254.00	0.600	0.600	48.046	0.948	31.68	63.02	62.770	62.83	62.580	
	2010	1845	2010-1845							0.0		4.00	0.00		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.495		0.000	0.000		0.495		0.495	1.03	47.601	250	254.00	0.600	0.601	48.096	0.949	31.61	62.83	62.580	62.64	62.390	
	1845	1850	1845-1850							41.3		4.00	0.17		0.0	4.00	0.00	0.67	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	2.002		0.000	0.000		2.670		2.670	6.80	36.590	250	254.00	0.400	0.400	39.260	0.775	87.39	60.90	60.650	60.55	60.300	
	1990	1985	1990-1985	13.51			14.00	35.36		35.4		4.00	0.14		0.0	4.00	0.00	0.57	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.74	0.488	0.488		0.000	0.000		1.061		1.061	2.72	37.886	250	254.00	0.390	0.394	38.947	0.769	55.82	63.97	63.720	63.75	63.500	
	1985	1980	1985-1980		26.67		27.00	54.42		89.8		4.00	0.36		0.0	4.00	0.00	1.45	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	1.65	0.462	0.950		0.000	0.000		2.405		2.405	5.43	41.893	250	254.00	0.510	0.510	44.297	0.874	25.50	63.69	63.440	63.56	63.310	
	1980	1975	1980-1975							89.8		4.00	0.36		0.0	4.00	0.00	1.45	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000	0.00	0.000	0.950		0.000	0.000		2.405		2.405	6.84	32.778	250	254.00	0.320	0.322	35.183	0.694	90.17	63.53	63.280	63.24	62.990	

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

VILLAGE OF CASSELMAN: SANITARY SEWER AND WATER MASTER PLAN
JLR No. 16953-119

Future Sanitary Sewer System - September 2023 (Existing Conditions)

SANITARY SEWER DESIGN SHEET

Design Constants/Coefficients

Manning's "n" =	0.013	
Infilt. Allowance =	0.28	L/s/ha
Residential Flow =	350	L/cap/d
Commercial/Institutional Flow Rate =	28000	L/gross ha/d
Industrial Flow Rate =	35000	L/gross ha/d

Unless otherwise indicated, Manning's 'n' is assumed to be 0.013

Population Data (Existing)

Total Number of Units:	1695
Census Existing Population:	4048
Population Calibration Factor:	0.791
Computed Population:	4048
Harmon Equation Correction Factor:	1.0
Weighted Coefficients	
Singles & Semi-Detached:	2.62
Multiple Dwellings:	2.04
Apartments:	1.42
ICI peaking factor:	1.50
PPU:	2.39

Population Data (New Subdivision)

Single Family:	3.4	persons/unit
Townhouse:	2.7	persons/unit
Semi-detached:	2.70	persons/unit
Apartments:	1.80	persons/unit
Duplex:	2.30	persons/unit
Res. Flow:	350	L/cap/d
Infilt. Allowance:	0.28	L/ha/s

Downstream Runs (orange)
If population changes, please change value in this cell (green box)

Prepared by: M.L.
Checked by: B.P.

SANITARY CONTRIBUTION — EXISTING RESIDENTIAL AREA

STREET	MANHOLE NUMBER FROM	MANHOLE NUMBER TO	FROM MH - TO MH	Census Data: Singles & Semis (units)	Census Data: Multiple Dwellings (units)	Census Data: Apart (units)	Vacant	Popul. (peop.)	Metered Residential	Cumm. Popul. (peop.)	Cumm. Metered Residential (L/s)	Peaking Factor	Avg. Flow (l/s)
	1975	1970	1975-1970							89.8		4.00	0.36
	1970	1850	1970-1850							89.8		4.00	0.36
	1900	1905	1900-1905	6.75			11.00	17.68		17.7		4.00	0.07
	1905	1910	1905-1910							17.7		4.00	0.07
	1910	1915	1910-1915							17.7		4.00	0.07
	1915	1920	1915-1920							17.7		4.00	0.07
	1920	1925	1920-1925	4.50			2.00	11.79		29.5		4.00	0.12
	1925	1930	1925-1930							29.5		4.00	0.12
	1930	1935	1930-1935							29.5		4.00	0.12
	1935	1940	1935-1940	2.25				5.89		35.4		4.00	0.14
	1940	1945	1940-1945	12.38			7.00	32.41		67.8		4.00	0.27
	1945	1950	1945-1950							67.8		4.00	0.27
	1950	1955	1950-1955							67.8		4.00	0.27
	1955	1960	1955-1960	11.26			12.00	29.47		97.2		4.00	0.39
	1960	1965	1960-1965							97.2		4.00	0.39
	1965	1850	1965-1850							97.2		4.00	0.39
	1850	1855	1850-1855	1.13			1.00	2.95		231.2		4.00	0.94
	1855	1860	1855-1860				8.00			231.2		4.00	0.94
	1860	1865	1860-1865							231.2		4.00	0.94
	1870	1865	1870-1865				5.00			0.0		4.00	0.00
	1865	1875	1865-1875							231.2		4.00	0.94
	1875	1880	1875-1880							231.2		4.00	0.94
	1880	1885	1880-1885							231.2		4.00	0.94
	1885	1890	1885-1890							231.2		4.00	0.94
	1890	1520	1890-1520							231.2		4.00	0.94
	1520	PS6	1520-PS6							567.1		3.95	2.30

SANITARY CONTRIBUTION — FUTURE RESIDENTIAL / EXISTING ICI / FUTURE ICI

FROM MH - TO MH	Future Res. Popul. (peop.)	Future Res. Cumm. Popul. (peop.)	Future Res. Peaking Factor	Future Res. Avg. Flow	Peak Res. Flow (l/s)	Existing ICI Areas (ha) Commerc.	Existing ICI Areas (ha) Industrial	Existing ICI Flows (l/s) Commerc./Inst.	Existing ICI Flows (l/s) Industrial	Existing ICI Peaking Factor	Existing ICI Flow (l/s)	Future ICI Areas (ha) Commerc.	Future ICI Areas (ha) Industrial	Future ICI Flows (l/s) Commerc.	Future ICI Flows (l/s) Industrial	Future ICI Peaking Factor	Future ICI Flow (l/s)	Cumm. Peak ICI Flow (l/s)
1975-1970		0.0	4.00	0.00	1.45	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000
1970-1850		0.0	4.00	0.00	1.45	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000
1900-1905		0.0	4.00	0.00	0.29	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000
1905-1910		0.0	4.00	0.00	0.29	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000
1910-1915		0.0	4.00	0.00	0.29	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000
1915-1920		0.0	4.00	0.00	0.29	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000
1920-1925		0.0	4.00	0.00	0.48	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000
1925-1930		0.0	4.00	0.00	0.48	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000
1930-1935		0.0	4.00	0.00	0.48	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000
1935-1940		0.0	4.00	0.00	0.57	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000
1940-1945		0.0	4.00	0.00	1.10	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000
1945-1950		0.0	4.00	0.00	1.10	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000
1950-1955		0.0	4.00	0.00	1.10	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000
1955-1960		0.0	4.00	0.00	1.58	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000
1960-1965		0.0	4.00	0.00	1.58	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000
1965-1850		0.0	4.00	0.00	1.58	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000
1850-1855		0.0	4.00	0.00	3.75	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000
1855-1860		0.0	4.00	0.00	3.75	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000
1860-1865		0.0	4.00	0.00	3.75	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000
1870-1865		0.0	4.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000
1865-1875		0.0	4.00	0.00	3.75	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000
1875-1880		0.0	4.00	0.00	3.75	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000
1880-1885		0.0	4.00	0.00	3.75	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000
1885-1890		0.0	4.00	0.00	3.75	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	0.000
1890-1520		0.0	4.00	0.00	3.75	0.00	1.87	0.00	0.76	1.50	1.136					1.500	0.000	1.136
1520-PS6		0.0	3.95	0.00	9.06	0.00	0.00	0.00	0.00	1.50	0.000					1.500	0.000	2.336

SANITARY CONTRIBUTION — EXTRANEOUS FLOWS AND TOTALS

FROM MH - TO MH	Existing Extraneous Area (Ha)	Existing Extraneous Peak Extr. Flow (l/s)	Existing Extraneous Cumm. Peak Extr. Flow (l/s)	Future Extraneous Area (Ha)	Future Extraneous Peak Extr. Flow (l/s)	Future Extraneous Cumm. Peak Extr. Flow (l/s)	Pump Flow (l/s)	Total Peak Des. Flow (l/s)	Pump Correction Factor (l/s)	Total Peak Des. Flow with pump (l/s)	Q_d/Q_{full} %	Residual Capacity (l/s)
1975-1970	0.00	0.000	0.950		0.000	0.000		2.405		2.405	6.80	32.952
1970-1850	0.00	0.000	0.950		0.000	0.000		2.405		2.405	4.00	57.664
1900-1905	1.32	0.369	0.369		0.000	0.000		0.655		0.655	0.56	116.833
1905-1910	0.00	0.000	0.369		0.000	0.000		0.655		0.655	2.11	30.467
1910-1915	0.00	0.000	0.369		0.000	0.000		0.655		0.655	2.10	30.557
1915-1920	0.00	0.000	0.369		0.000	0.000		0.655		0.655	2.10	30.535
1920-1925	0.65	0.182	0.551		0.000	0.000		1.028		1.028	3.40	29.225
1925-1930	0.00	0.000	0.551		0.000	0.000		1.028		1.028	2.99	33.366
1930-1935	0.00	0.000	0.551		0.000	0.000		1.028		1.028	2.14	47.007
1935-1940	0.41	0.114	0.665		0.000	0.000		1.238		1.238	4.06	29.258
1940-1945	2.17	0.607	1.272		0.000	0.000		2.370		2.370	7.87	27.742
1945-1950	0.00	0.000	1.272		0.000	0.000		2.370		2.370	7.87	27.754
1950-1955	0.00	0.000	1.272		0.000	0.000		2.370		2.370	7.67	28.540
1955-1960	2.49	0.697	1.969		0.000	0.000		3.545		3.545	11.74	26.641
1960-1965	0.00	0.000	1.969		0.000	0.000		3.545		3.545	11.49	27.308
1965-1850	0.00	0.000	1.969		0.000	0.000		3.545		3.545	6.46	51.294
1850-1855	0.35	0.098	5.018		0.000	0.000		8.765		8.765	16.15	45.491
1855-1860	1.44	0.404	5.423		0.000	0.000		9.169		9.169	18.51	40.379
1860-1865	0.00	0.000	5.423		0.000	0.000		9.169		9.169	17.05	44.606
1870-1865	0.56	0.157	0.157		0.000	0.000		0.157		0.157	0.30	51.822
1865-1875	0.00	0.000	5.580		0.000	0.000		9.327		9.327	21.56	33.925
1875-1880	0.00	0.000	5.580		0.000	0.000		9.327		9.327	21.57	33.912
1880-1885	0.00	0.000	5.580		0.000	0.000		9.327		9.327	23.53	30.317
1885-1890	0.00	0.000	5.580		0.000	0.000		9.327		9.327	22.39	32.322
1890-1520	1.87	0.524	6.104		0.000	0.000		10.987		10.987	23.31	36.142
1520-PS6	0.00	0.000	16.584		0.000	0.000		27.984		27.984	27.21	74.847

SEWER DATA

FROM MH - TO MH	DIA. (mm)	Actual Dia. (mm)	DESIGN SLOPE (%)	ACTUAL SLOPE (%)	CAPAC. (l/s)	VEL. (m/s)	LENGTH (m)	Upstream Obvert (m)	Upstream Invert (m)	Downstream Obvert (m)	Downstream (m)	Comments
1975-1970	250	254.00	0.320	0.325	35.356	0.698	52.34	63.24	62.990	63.07	62.820	
1970-1850	250	254.00	0.930	0.938	60.069	1.185	52.27	63.07	62.820	62.58	62.330	
1900-1905	250	254.00	0.250	3.586	117.488	2.319	17.57	62.67	62.420	62.04	61.790	
1905-1910	250	254.00	0.250	0.252	31.123	0.614	43.71	63.12	62.870	63.01	62.760	
1910-1915	250	254.00	0.250	0.253	31.212	0.616	43.46	63.01	62.760	62.90	62.650	
1915-1920	250	254.00	0.250	0.253	31.191	0.616	43.52	62.90	62.650	62.79	62.540	
1920-1925	250	254.00	0.240	0.238	30.253	0.597	46.26	62.73	62.480	62.62	62.370	
1925-1930	250	254.00	0.200	0.307	34.394	0.679	13.01	62.59	62.340	62.55	62.300	
1930-1935	250	254.00	0.240	0.600	48.035	0.948	16.68	62.65	62.400	62.55	62.300	
1935-1940	250	254.00	0.240	0.242	30.496	0.602	16.55	62.49	62.240	62.45	62.200	
1940-1945	250	254.00	0.240	0.236	30.112	0.594	72.16	62.39	62.140	62.22	61.970	
1945-1950	250	254.00	0.240	0.236	30.124	0.595	72.10	62.22	61.970	62.05	61.800	
1950-1955	250	254.00	0.250	0.248	30.910	0.610	36.25	62.05	61.800	61.96	61.710	
1955-1960	250	254.00	0.240	0.237	30.186	0.596	67.58	61.96	61.710	61.80	61.550	
1960-1965	250	254.00	0.250	0.247	30.853	0.609	64.69	61.80	61.550	61.64	61.390	
1965-1850	300	304.80	0.290	0.295	54.839	0.752	71.07	61.66	61.360	61.45	61.150	
1850-1855	300	304.80	0.290	0.289	54.256	0.744	24.20	60.55	60.250	60.48	60.180	
1855-1860	300	304.80	0.240	0.241	49.549	0.679	66.33	60.45	60.150	60.29	59.990	
1860-1865	300	304.80	0.280	0.284	53.775	0.737	66.87	60.29	59.990	60.10	59.800	
1870-1865	250	254.00	0.740	0.702	51.979	1.026	15.67	60.92	60.670	60.81	60.560	
1865-1875	300	304.80	0.100	0.184	43.252	0.593	48.96	60.04	59.740	59.95	59.650	
1875-1880	300	304.80	0.180	0.184	43.239	0.593	32.66	59.89	59.590	59.83	59.530	
1880-1885	300	304.80	0.180	0.154	39.644	0.543	19.43	59.77	59.470	59.74	59.440	
1885-1890	300	304.80	0.180	0.170	41.649	0.571	99.74	59.67	59.370	59.50	59.200	
1890-1520	300	304.80	0.210	0.218	47.129	0.646	96.22	59.50	59.200	59.29	58.990	
1520-PS6	450	457.20	0.100	0.120	102.831	0.626	33.46	59.29	58.840	59.26	58.800	