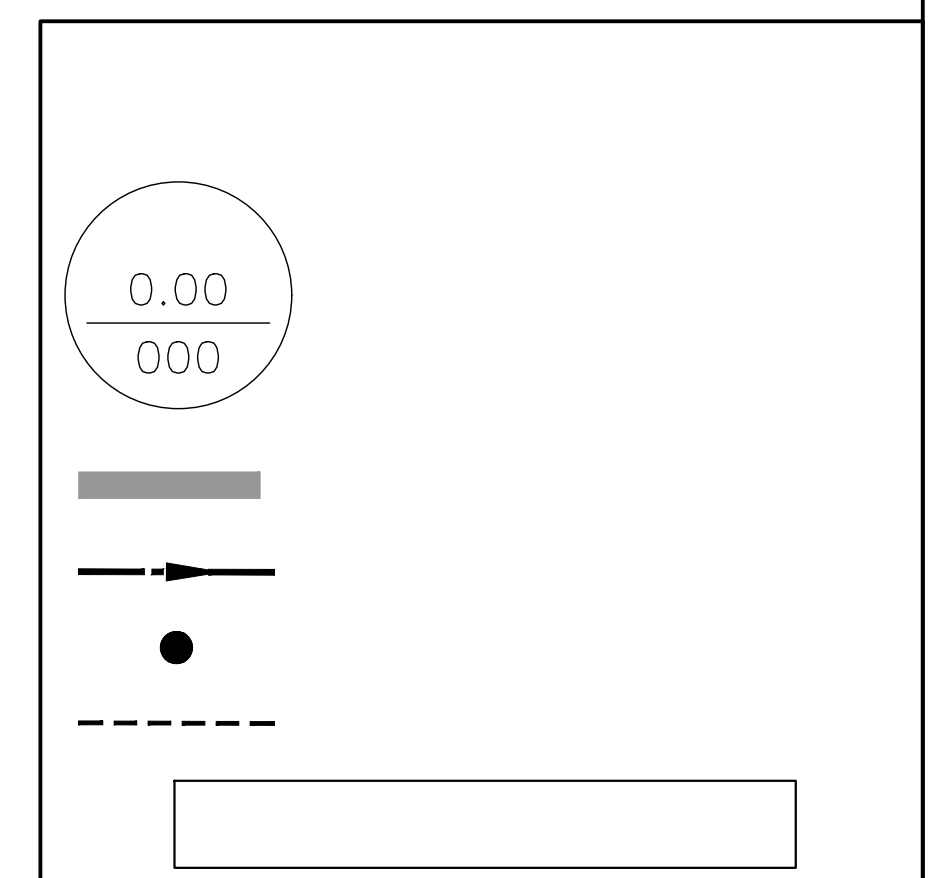
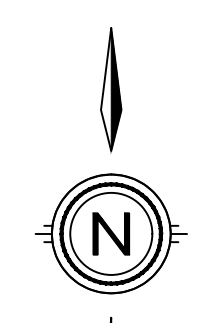
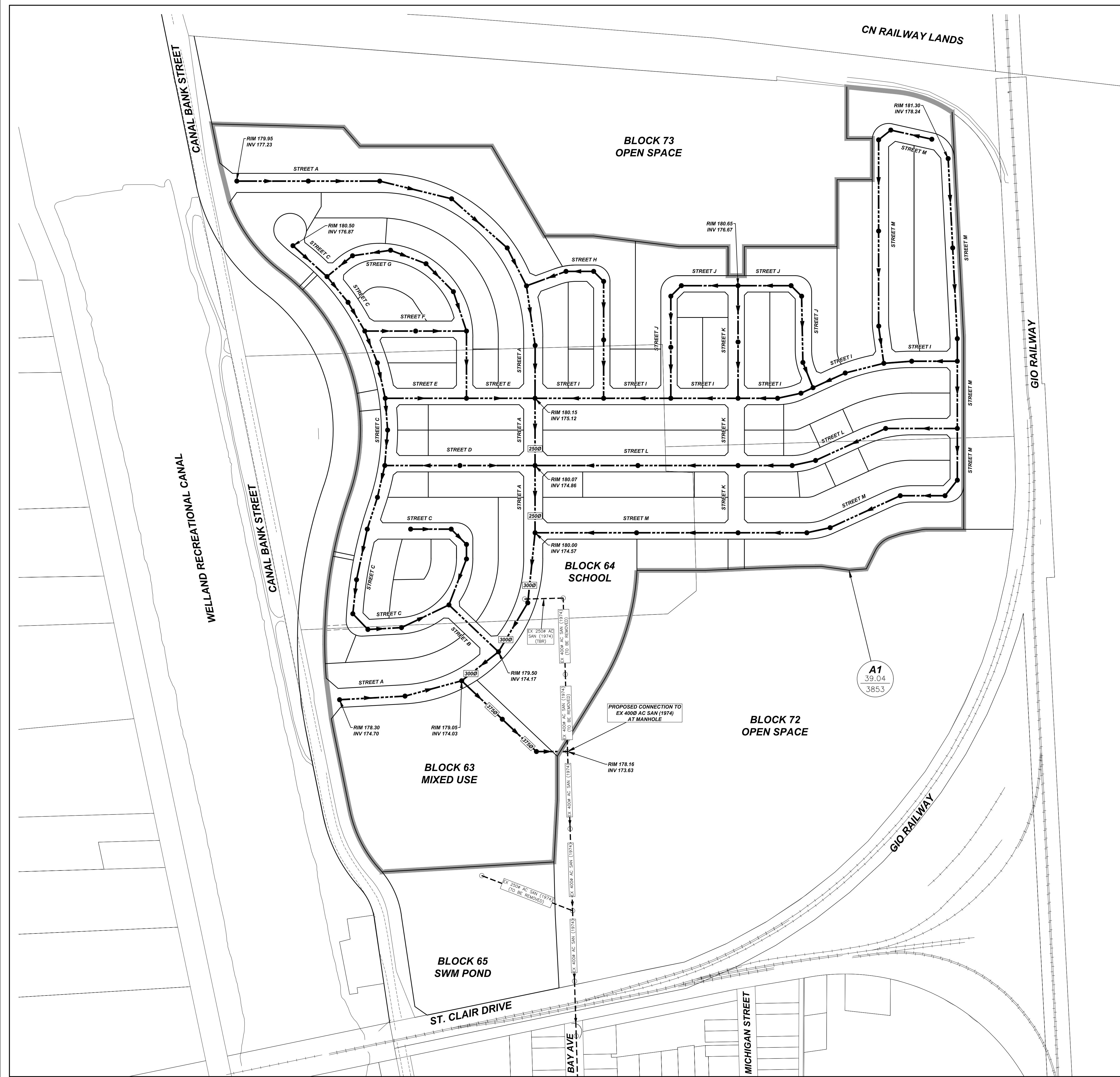
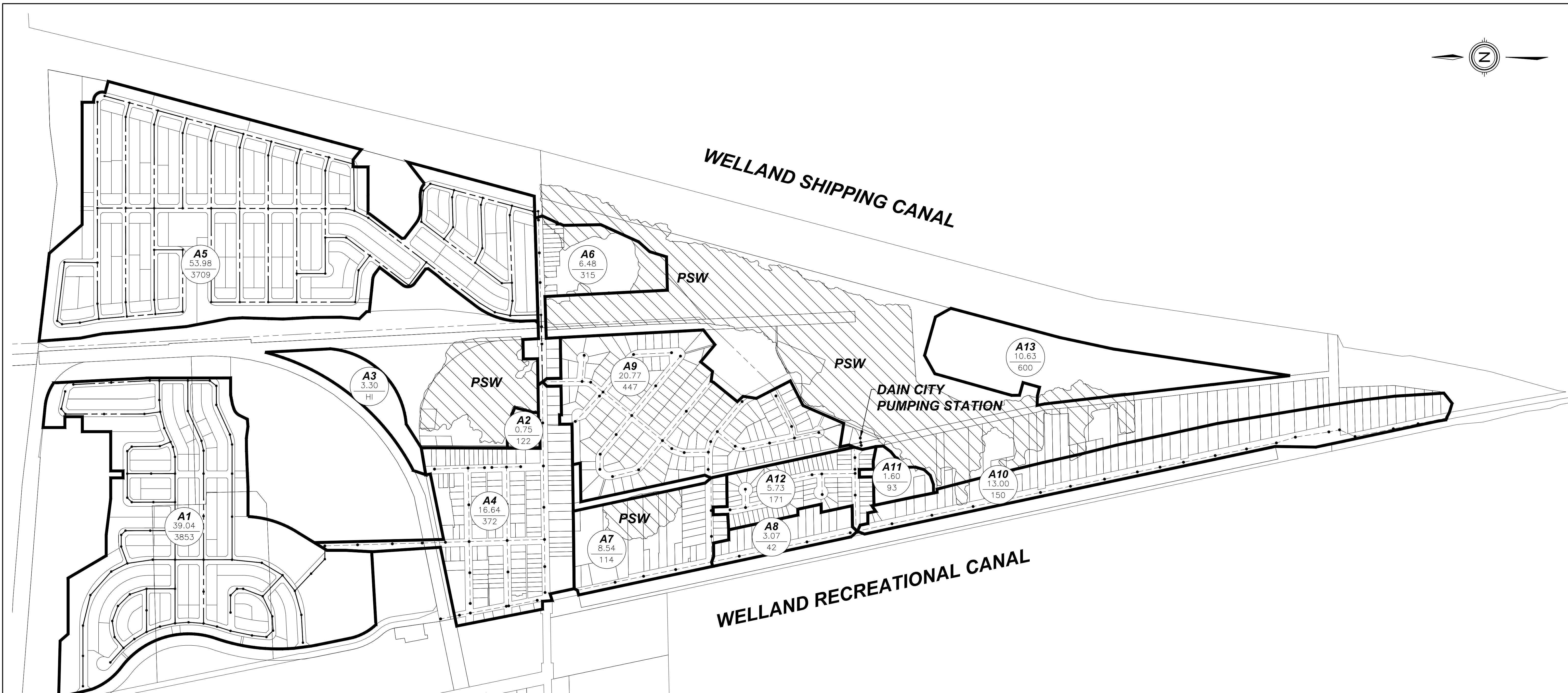
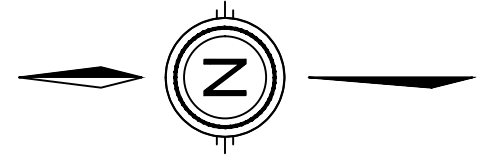


CONSULTANT FILE No.	0585
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UPPER CANADA CONSULTANTS
 30 HANNOVER DRIVE, UNIT #3
 ST. CATHARINES, ONTARIO, L2W 1A3

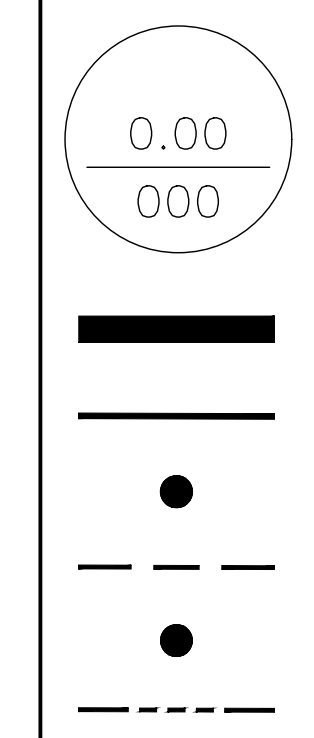
DESIGN FLOWS
 RESIDENTIAL: 320 LITRES/PERSON/DAY (AVERAGE DAILY FLOW FOR EXISTING DWELLINGS)
 INDUSTRIAL: 15000 LITRES/HECTARE/DAY (AVERAGE HEAVY INDUSTRIAL FLOW)
 INFILTRATION RATE: 0.10 LITRES/HECTARE (INDUSTRIAL, INSTITUTIONAL, AND OPEN SPACE)
 INFILTRATION RATE: 0.28 LITRES/HECTARE (EXISTING RESIDENTIAL)
 INFILTRATION RATE: 0.18 LITRES/HECTARE (FUTURE RESIDENTIAL)

SEWER DESIGN
 PIPE ROUGHNESS: 0.013 FOR MANNING'S EQUATION
 PIPE SIZES: 1.016 IMPERIAL EQUIVALENT FACTOR
 PERCENT FULL: TOTAL PEAK FLOW / CAPACITY

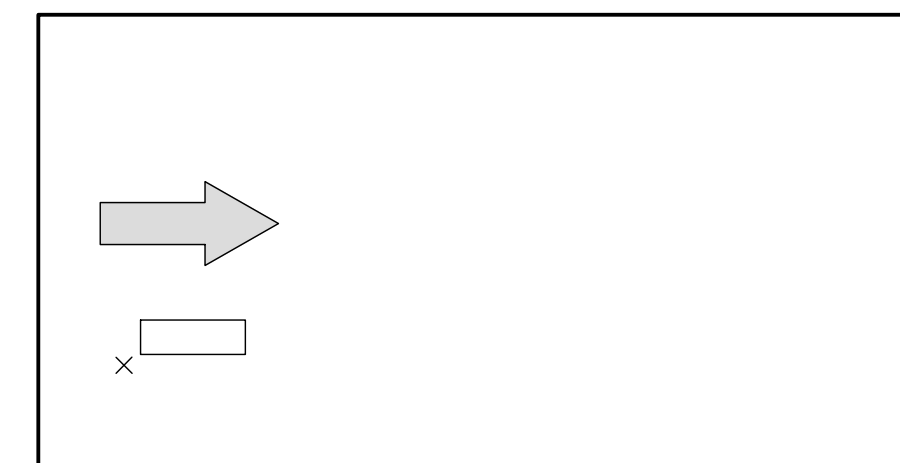
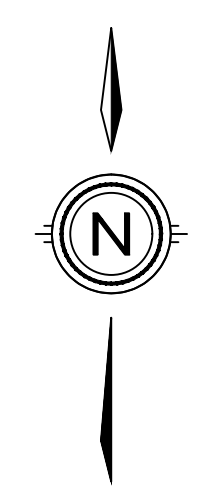
MUNICIPALITY: CITY OF WELLAND
 PROJECT: DAIN WEST
 PROJECT NO: 0585

SANITARY SEWER DESIGN SHEET

LOCATION	Description	Land use	RESIDENTIAL						INDUSTRIAL			TOTAL PEAK FLOW		DESIGN FLOW					
			Increment Area (hectares)	Accumulated Area (hectares)	Population Density (persons/hectare)	Population Increment	Total Population Served	Peaking Factor	Peak Flow (L/s)	Area (hectares)	Peaking Factor	Peak Flow (L/s)	Infiltration Flow (L/s)	Total Peak Flow (L/s)	Pipe Diameter (mm)	Pipe Slope (%)	Full Flow Velocity (m/s)	Full Flow Capacity (L/s)	Check Percent Full
A1 - DAIN WEST	Residential	39.04	39.04	98.7	3853	3853	3.35	33.59				7.03	40.62						
A2 - CHURCH LANDS	Institutional	0.75	0.75	162.7	122	122	4.22	1.91				0.08	1.98						
A3 - VERBIO DIESEL CANADA	Industrial								3.30	4.80	2.75	0.33	0.33						
A4 - HURON-ERIE-FORKS	Residential	16.64	56.43	22.4	372	4347	3.30	39.16				12.09	51.25	400	0.16	0.670	86.90	59.0%	
A5 - 401 CANAL BANK STREET	Residential	53.98	53.98	68.7	3709	3709	3.36	32.48				9.72	42.19						
A6 - SOUTH FORKS	Residential	6.48	60.46	48.6	315	4024	3.33	36.06				10.88	46.94	375	0.40	1.015	115.68	40.6%	
A7 - KINGSWAY-GLENWOOD	Residential	8.54	8.54	13.3	114	114	4.23	1.78				2.39	4.18						
A8 - KINGSWAY	Residential	3.07	11.61	13.7	42	156	4.19	2.42				3.25	5.67						
A9 - CRESCENT-THORNTON	Residential	20.77	149.27	21.5	447	8974	3.00	74.80				32.04	106.84	450	0.30	0.992	162.91	65.6%	
A10 - HAUN-CUNARD-WHITE	Residential	13.00	13.00	11.5	150	150	4.19	2.33				3.64	5.97						
A11 - TALBOT	Residential	1.60	1.60	58.1	93	93	4.25	1.46				0.29	1.75						
A12 - REGETTA	Residential	5.73	20.33	29.8	171	414	4.02	6.16				4.96	11.12						
A13 - DAIN SOUTH-SOUTH	Residential	10.63	10.63	56.4	600	600	3.93	8.74				1.91	10.65						
TO PUMPING STATION			180.23			9988	2.96	84.75				38.91	123.66	450	0.30	0.992	162.91	75.9%	



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