

REQUIRED POWERLINE DATA

The following information is required for each powerline paralleling the pipeline, in accordance with Clause 3.1.1 of CAN/CSA –C22.3 No. 6-13 Standard – *Principles and Practices of Electrical Coordination between Pipelines and Electric Supply Lines*:

General	
1. Circuit No./ID/Name	C21J/C22J
2. System Voltage (line to line):	230 kV
3. Staking List or Equivalent	Attached Google Earth file (Towers 1-28)  sectr 230kv line_v10b.kmz
Tower Details	
4. Conductor Configuration Details:	
a) Vertical separation between conductors:	See Fig 1
b) Average height of conductors:	8m for bottom phase at 127 deg C
c) Max sag of conductors:	10m at 127 deg C
d) Horizontal separations between conductors:	See Fig 1
5. Shield Wire Details:	
a) Size, type (material):	2 (Two) 7#5 Alumoweld
b) Resistance (ohms/km):	0.74278
c) Continuous? (y/n):	yes
6. Grounding Details:	
a) Foundation details for suspension towers or typical details for grounding electrodes:	1 augured footing (3.35m dia x 12m deep)
b) Grounding resistance of each tower:	20 ohm
c) Average tower grounding resistance to remote earth:	20 ohm
d) Details of counterpoise (if applicable)	n/a
7. Phase Transposition Details:	
a) Phase arrangement for each circuit (i.e. A-B-C top-bottom):	C22J (B-W-R top-bottom) C21J (W-B-R top-bottom)
b) GPS coordinates of transposition tower(s) along common ROW:	No transposition
8. Average Distance Between Towers:	Ruling Span = 280 m



Operational Details			
9. Phase Current Loading		Amps (per circuit)	
Annual Peak (in 2018)		210	
Peak Projected (long-term)		620	
Average Summer (in 2018)		140	
Average Winter (in 2018)		150	
Average Projected (long-term)		470	
10. Single Phase Line-to-Ground Fault Currents (A)*			
Fault Location (within 100m)	From North	From South	Total
7 km from Leamington TS (42° 9'52.13"N, 82°35'57.92"W)	7166	326	7492
4 km from Leamington TS (42° 8'6.74"N, 82°36'5.35"W)	6461	328	6789
3.5 km from Leamington TS (42° 7'49.86"N, 82°36'6.42"W)	6357	329	6686
2 km from Leamington TS (42° 7'4.63"N, 82°36'10.05"W)	6065	330	6395
Outside Leamington TS (42° 5'55.51"N, 82°36'14.90"W)	5720	320	6040
11. Primary Line-to-Ground Fault Duration**		Normal clearing time, 106 ms; Delayed clearing time due to breaker failure 246 ms.	

* The transmission line has two circuits, and the higher fault current of the two circuits is provided.

** Hydro One's practice is to use 500 ms fault duration to conduct grounding safety assessment at stations to account for delayed clearing of faults by timed backup line protection.

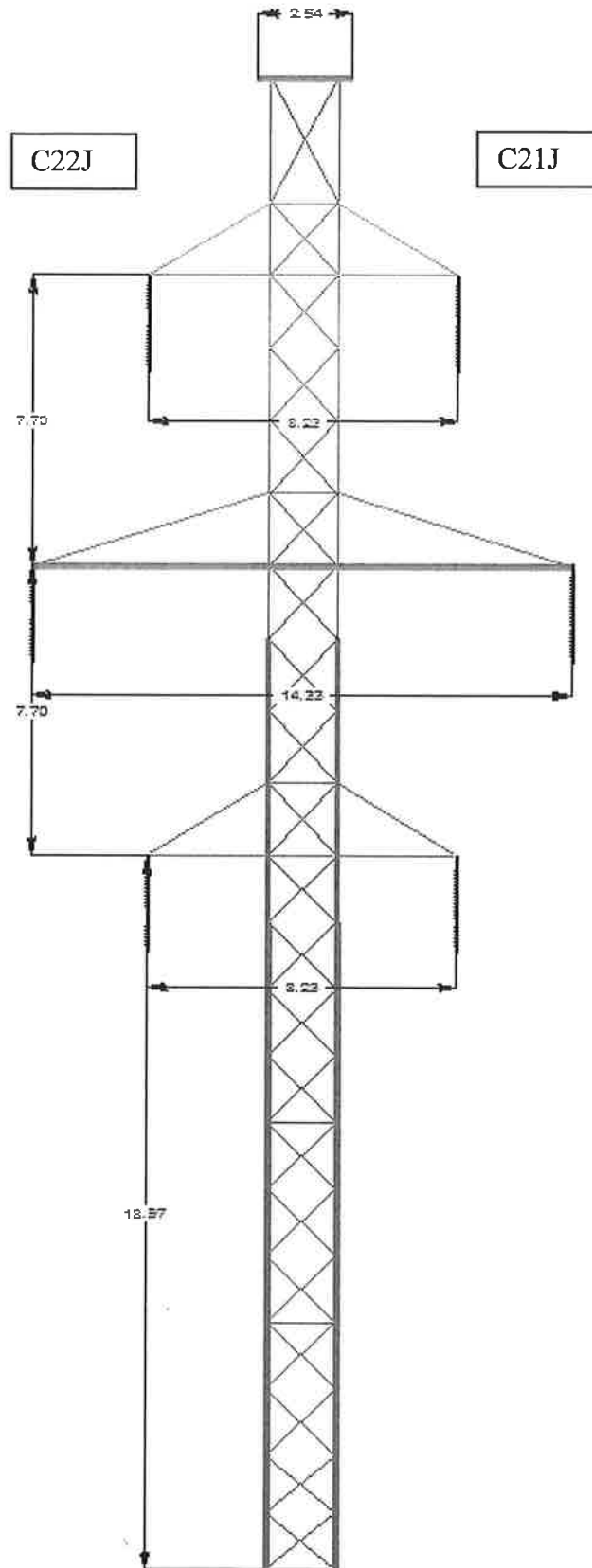


Figure 1: Tower geometry/dimensions (m) facing N (no extensions)

