

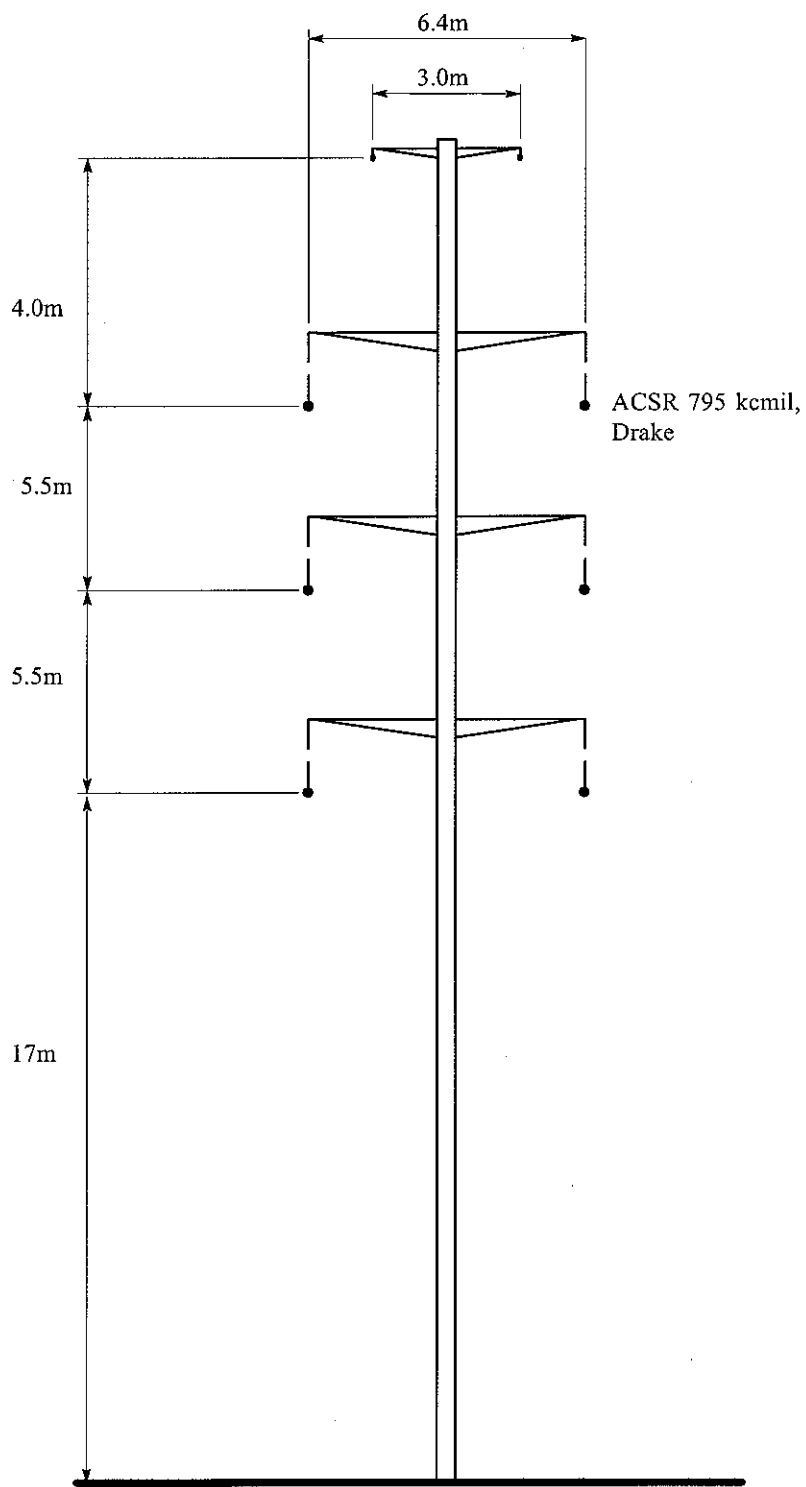
1 **FACILITIES - TRANSMISSION LINE**

2 The Greenwich Windfarm Transmission Line will connect the Greenwich Windfarm to  
3 Hydro One's existing 230kV circuits M23L and M24L and comprise approximately 10.3  
4 kilometres of double circuit dedicated 230kV line. The line will connect, at its western  
5 terminus, to the Greenwich Windfarm Substation and at its eastern terminus, to the  
6 Greenwich Windfarm Switching Station.

7 A single-line diagram of the proposed electrical connection is attached at Exhibit E, Tab  
8 2, Schedule 2.

9 The proposed Greenwich Windfarm Transmission Line will proceed in a single pole  
10 configuration, with a parallel alignment of wires in order to accommodate both circuits  
11 required to connect Greenwich Windfarm to the grid. A pole schematic is included at  
12 Exhibit E, Tab 2, Schedule 3. The span length between each pole is expected to be  
13 approximately 100 meters although the final design will depend on the outcome of  
14 detailed geotechnical analysis, final engineering design as well as clearance  
15 considerations along the proposed route of the Greenwich Transmission Line. Further  
16 detailed engineering and geotechnical analysis might require the transmission line to be  
17 a double poled H-Frame structure but at this stage, it appears that the single pole  
18 structure is most likely.

**CONFIDENTIAL DOCUMENT**  
**TAB E-2-2**



R1	X1	R0	X0	B1	C1	C0
$\Omega/\text{km}$	$\Omega/\text{km}$	$\Omega/\text{km}$	$\Omega/\text{km}$	$\mu\text{S}/\text{km}$	$\mu\text{F}/\text{km}$	$\mu\text{F}/\text{km}$
0.0885	0.4862	0.3394	1.1142	3.4610	0.009181	0.006186

1 **FACILITIES - SUBSTATION**

2 The Greenwich Windfarm Substation will comprise two 34.5/ 246 kV transformers, each  
3 with a dedicated 230 kV circuit breaker, buswork, switches and line termination  
4 equipment, as well as 34.5 kV circuit breakers and associated switchgear, switched  
5 capacitor banks for reactive (VAR) support and revenue metering (with transformer loss  
6 and 230kV line loss compensation/adjustment). Line protection and monitoring will be  
7 provided by multi-function micro-processor based relays and will include primary and  
8 back-up systems that incorporate combinations of high-speed differential, impedance  
9 (step-distance), overcurrent, and breaker failure functions. The relays will also provide  
10 additional other monitoring, control and communications functions as per their technical  
11 specifications.

12 The electrical ratings details of the transformers will be selected to suit the short circuit  
13 and voltage regulation requirements of Hydro One's 230kV transmission system, and  
14 will be confirmed when the CIA is issued.

15 An electrical single-line diagram showing the basic design of the proposed Greenwich  
16 Windfarm Substation is included in Exhibit E, Tab 3, Schedule 2. The detailed  
17 specifications of the transformer are set out in Exhibit E, Tab 3, Schedule 3.

**CONFIDENTIAL DOCUMENT**  
**TAB E-3-2**

**CONFIDENTIAL DOCUMENT**  
**TAB E-3-3**

1

**FACILITIES - SWITCHING STATION**

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The Greenwich Windfarm Switching Station will be located adjacent to Hydro One's 230 kV double-circuit transmission line M23L/M24L, at a point that is located approximately 183 km from Hydro One's Marathon Transmission Station, and 47 km from Hydro One's Lakehead Transmission Station.

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The Greenwich Windfarm Switching Station will include two 230 kV breakers and motorized disconnect switches ("MOD"), each tapped to Hydro One's M23L and M24L circuits and two 230kV MOD switches for the two transmission line terminations. Hydro One will install the structures and conductor necessary to tie the Greenwich Windfarm Switching Station to the two existing Hydro One transmission lines. Protection and monitoring will be provided by multi-function micro-processor based relays. Protection includes primary and back-up relay systems, incorporating combinations of high-speed differential, impedance (step-distance), overcurrent, and breaker failure functions in addition to other monitoring, control, and communications functions that are available on these types of relays.

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A proposed layout of the Greenwich Windfarm Switching Station is attached at Exhibit E, Tab 4, Schedule 2.

