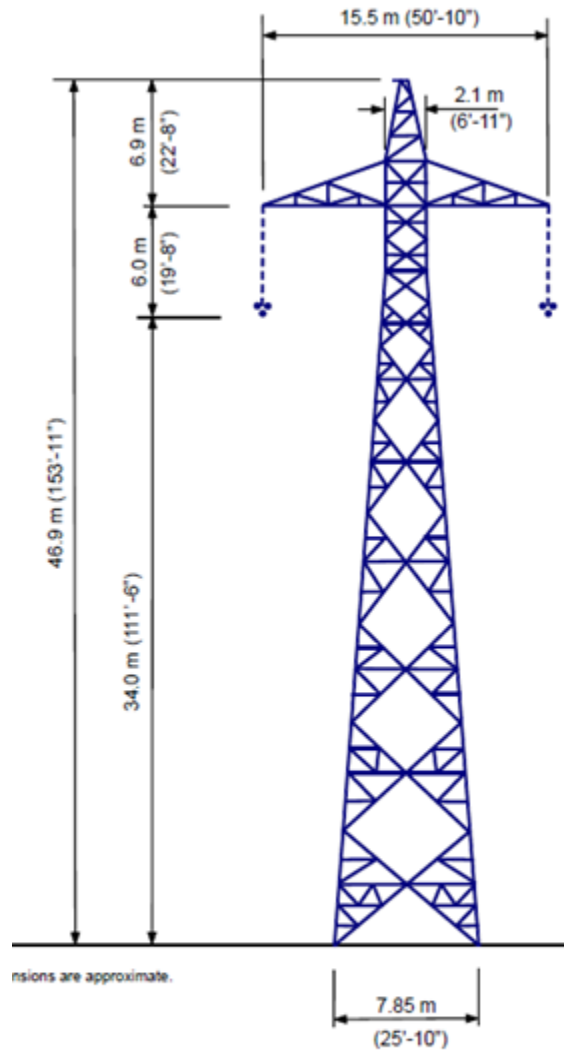
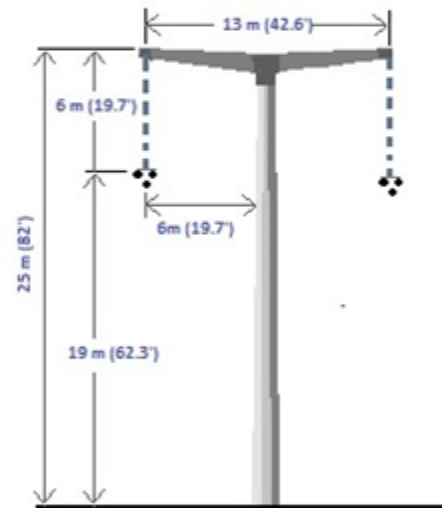


Compact DC Transmission

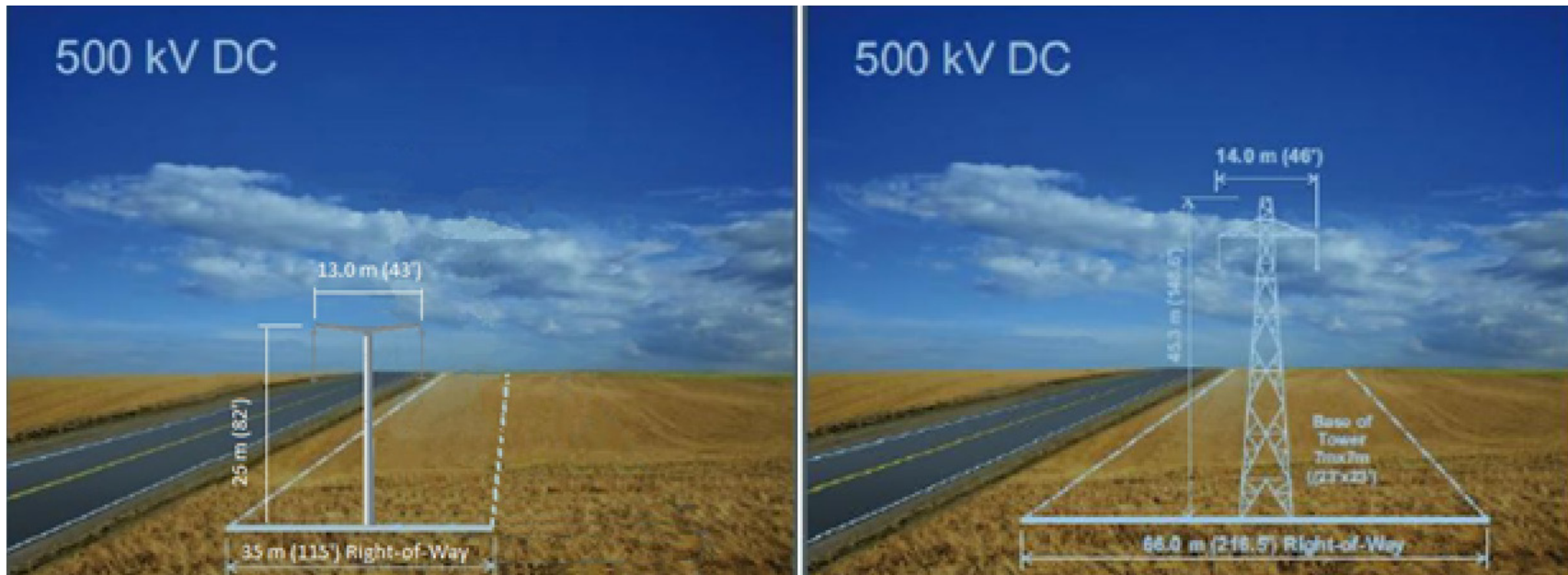


(a) Typical self-supporting suspension tower configuration for ± 500 kV HVDC, 2300 MW, 20.8 m sag, 488 m span, 13.2 m mid span ground clearance [9]



(b) Aesthetic, low profile pylon for ± 500 kV HVDC, 2300 MW, 5.8 m sag, 258 m span, 13.2 m mid span ground clearance. Developed from a Bystrup design

Comparison of Transmission Towers for 500 kV, 2000 MW DC



Low profile aesthetic structure for 500 kV 2300 MW HVDC Scheme (Thermal rating 4000 MW)

Figure 2.4-1 is obtained from Chapter 2 of Manitoba Hydro's Environmental Impact Statement for Bipole III filed with the Clean Environment Commission December 1st, 2011.

Advantages of low profile aesthetic pylons:

1. More acceptable for social license and better chance of public acceptance – if impacted persons have a meaningful say
2. Tubular steel foundation pile driven in ½ day, with whole pylon erected in one day. Special foundations for rock
3. If through forest then at tree level, and narrower ROW means less adverse environmental impact
4. Lower height and so less wind force and less blowout of conductors also reducing ROW
5. Lower lightning shadow, with less lightning strikes and lower height means less line faults
6. If constructed road side, easier to maintain with bucket trucks and safer live line working
7. Insulators at lower level so safer live-line maintenance with insulated bucket trucks or lifts

Maryam Salimi, University of Manitoba
Lionel Barthold, IMod, Inc. NY
Dennis Woodford, Electranix Corporation, MB
Input from Bystrup, Copenhagen

Low profile with twice the number of towers, but half the height with same conductors, less sag and same ground clearance

