

Turbine Foundation Loads

Wind Thrust Overturning Moment

Proven Energy WT 6000 Wind Turbine TM900

Revision			Prepared by	
Status	Date	No.	Author	Checked
Issued	18/05/05	0.1	NJH	JA



Calculate the Tower foundation loads due the wind loading on the turbine

Loads in accordance with international norm: IEC 61400-2

Assume that the tower wind loading is a uniformly distributed load, variations in wind speed with height will be neglected in this calculation.

Input Parameters

Head Mass =	500 kg ⁱ
Mast Mass =	360 kg ⁱ
Mast Length =	9 m
Head Thrust =	10 kN ⁱ
Tower Thrust =	7.7 kN ⁱⁱⁱ

Total Overturning Moment = 118.9 kNm

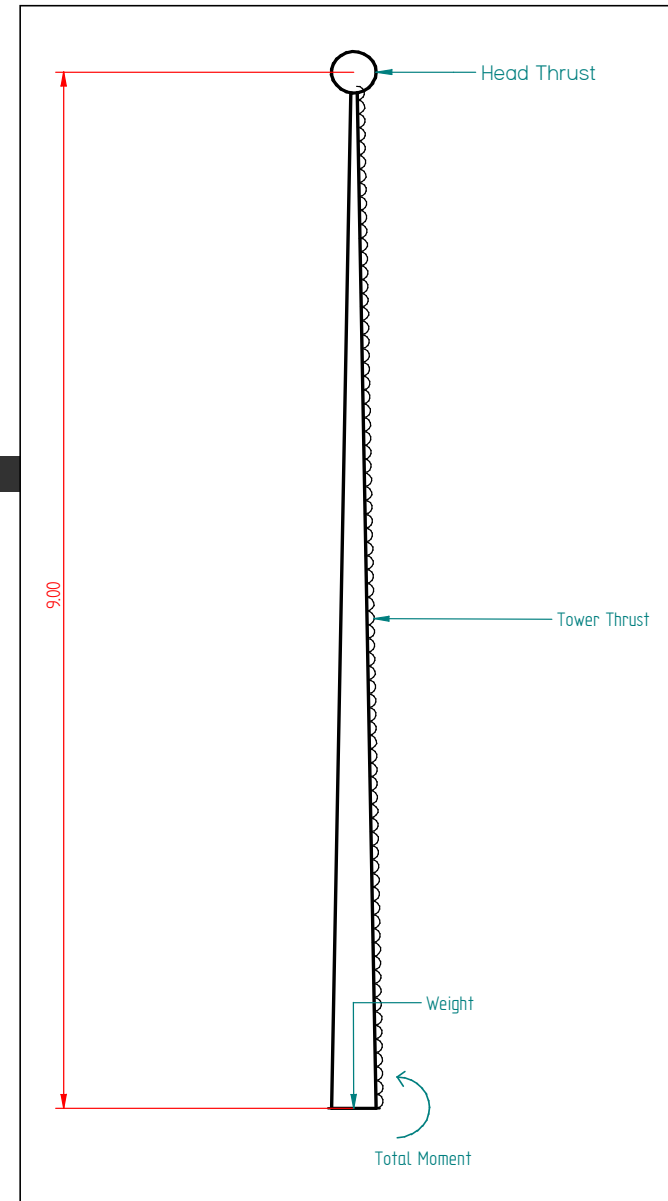
Total Horizontal Thrust = 17.7 kN

Turbine Weight = 8.4 kN

(vertical force ex. foundation)

References

- i. From Technical Specifications pdf on Proven Website
- ii. From Tower wind loading calculations spreadsheet



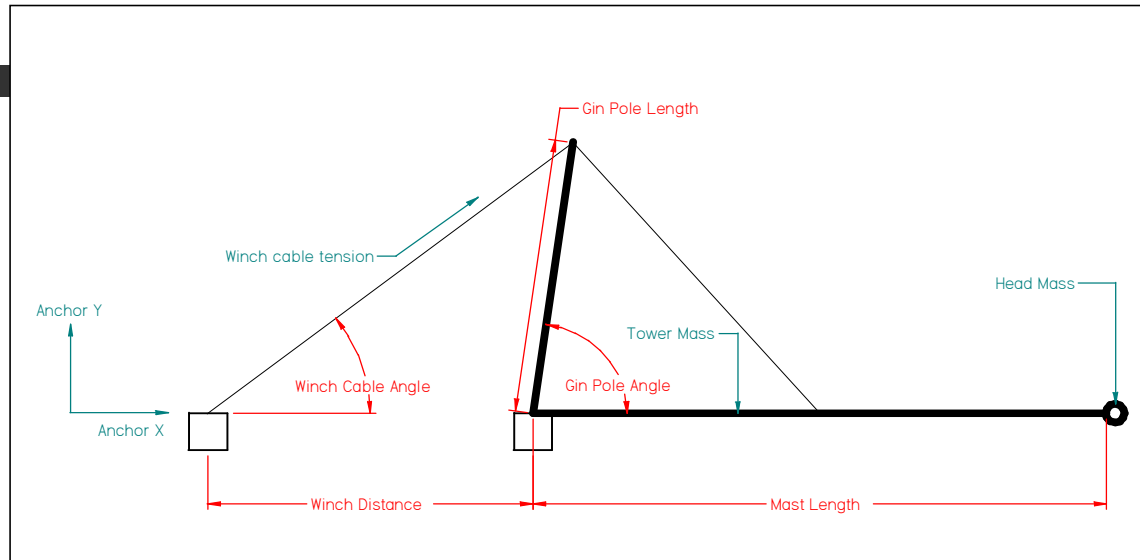
Turbine Foundation Loads
Anchor Point Loading During Winching
Proven Energy WT 6000 Wind Turbine TM900

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Input Parameters

Head Mass =	500 kg ⁱ
Mast Mass =	360 kg ⁱ
Mast Length =	9 m
Mast CoG =	3.9 m ⁱⁱ
Gin pole length =	3 m
Min Winching distance =	9 m
Gin Pole angle	82 deg
	1.4 rads
Winch cable angle =	18 deg
	0.3 rads



Find the lifting moment required due to the head weight and tower weight

Assume highest loading is when the turbine is horizontal, and has just left the ground, this causes the greatest moment.

Total moment due to head and mast weight = 57.9 kNm
 Horizontal force at the end of the gin pole = 19.5 kN

Winch Cable tension = 20.4 kN

Winch Anchor X = 19.5 kN

Winch Anchor Y = 6.2 kN

References

- From Technical Specifications pdf on Proven Website
- From SE model