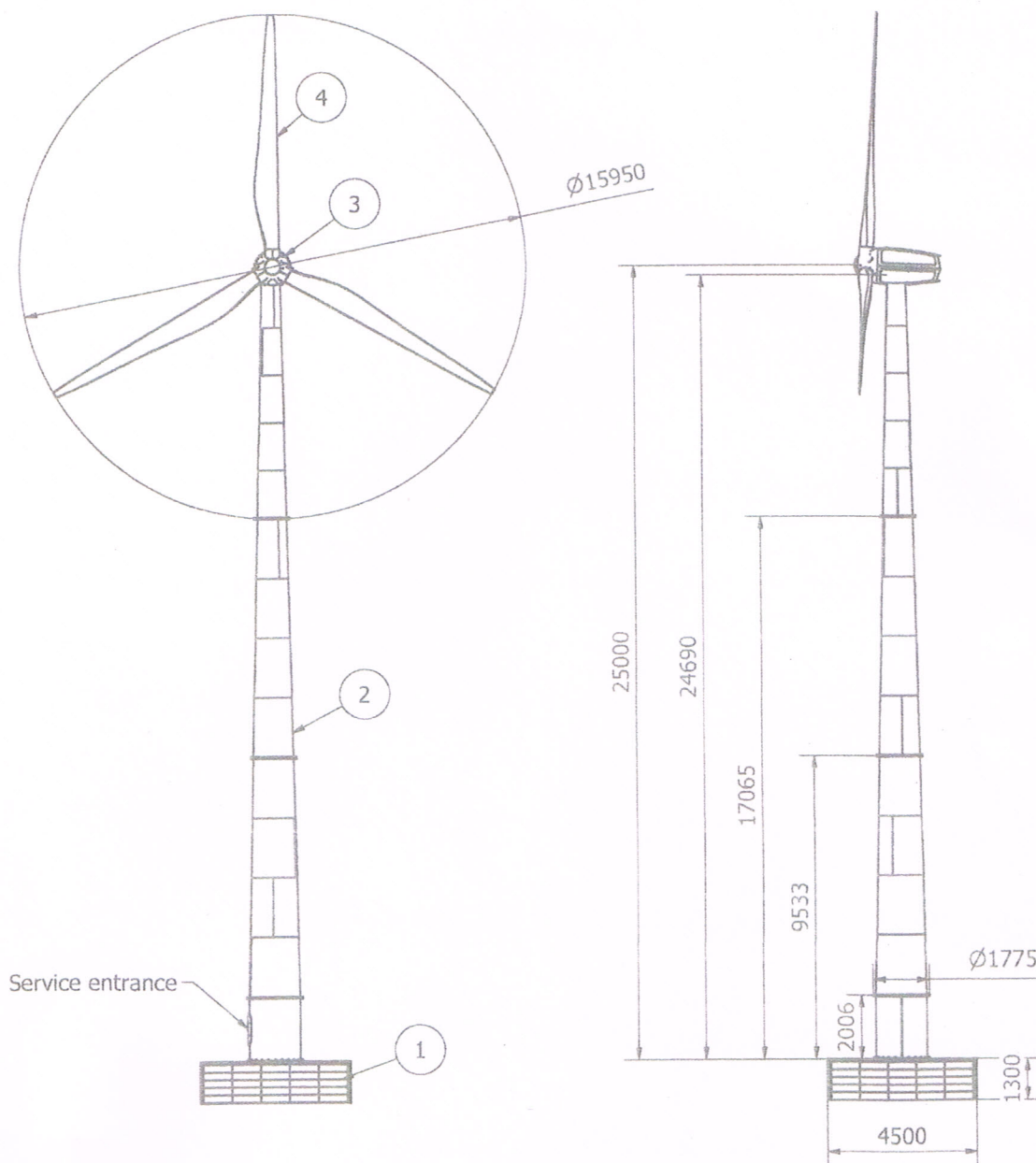


Bijlage 1

Logic Windturbine

Windmolens op Maat levert een windmolen van het type : Logic windturbine 25 m.

Specificaties :



4 Wind turbine data

The LWT25 turbine is stall regulated with a rated power of 25 kW and a rotor diameter of 15.95m. It fits the definition of a small wind turbine with a rotor diameter of less than 200m², as defined by IEC 61400-2.

The three blades are equipped with a hydraulic tip-brake system. It can be released by the centrifugal force or by the controller and is part of a normal shutdown procedure. The system can be reset without canting the tower. The LWT25 is controlled using a custom controller from Orbital A/S [7].

Table 1: LWT25 specifications

WT manufacturer	Logic-Energy Aps, Denmark
IEC SWT class	IEC SWT class III
Rated power	10-25 kW
Rated wind speed V_r	10 m/s
Pitch angle (rotor set)	$-1^\circ \pm 1^\circ$
Pitch angle tolerance (blade to blade)	0.2°
RPM	45 rpm
Rotor diameter	15.95 m
Rotor area	199.9 m ²
RNA weight (including bolts and cables etc.)*	1900 kg
Design life time	20 years
Wind conditions	
Turbulence intensity I_{15}	0.18 [-]
Wind shear exponent	0.2 [-]
Hub height operating wind speed range $V_{in} - V_{out}$	3 – 25 m/s
Annual average wind speed at hub height V_{ave}	7.5 m/s
Ref. wind speed V_{ref}	37.5 m/s
Hub height 50-year extreme wind speed V_{e50}	52.5 m/s
Conical Towers	
Hub height	14.944 m
Hub height	19.944 m
Hub height	24.944 m
Lattice Tower	
Hub heights	29.944 m
Tower, weight (including bolts and cables etc.)	5000 kg
Major components	
Blade type	OLW 750 Tip-Brake
Gear box type	G43R 200LX6 LL NS
Generator type	VEM GENERATOR G43R 200LX6 NS PT KR HW 22,00 kW, 1023 rpm, S1, 400/690 V D7Y, 50 Hz, IP 55, IM B3,
Disc brakes (2 off)	Branham FS47EF 350mm Diameter Brake Disc

*A blades have been weighed to 147kg, and the prototype nacelle and hub including cover, bolts, cables and bearings to 1450kg. The blades included add-ons for noise reduction, but these are not expected to affect the loads.

10.7 25m Conical Tower Load Distribution

The maximum bending moment in the lattice tower is driven by DLC5.1 with a wind direction of 180° or 0°. The distribution including LPSF is shown below.

Foundation loads are shown in Table 34

Table 33 20m conical tower load distribution

Sensor	Position [m]	LPSF 1.35
TwrBsMyt_[kN-m]	0.000	1380.8
TwHt1MLyt_[kN-m]	1.371	1272.5
TwHt2MLyt_[kN-m]	4.112	1067.9
TwHt3MLyt_[kN-m]	6.853	881.2
TwHt4MLyt_[kN-m]	9.594	711.5
TwHt5MLyt_[kN-m]	12.335	557.1
TwHt6MLyt_[kN-m]	15.076	416.9
TwHt7MLyt_[kN-m]	17.817	288.4
TwHt8MLyt_[kN-m]	20.558	171.3
TwHt9MLyt_[kN-m]	23.299	66.5
YawBrMyn_[kN-m]	24.670	36.2

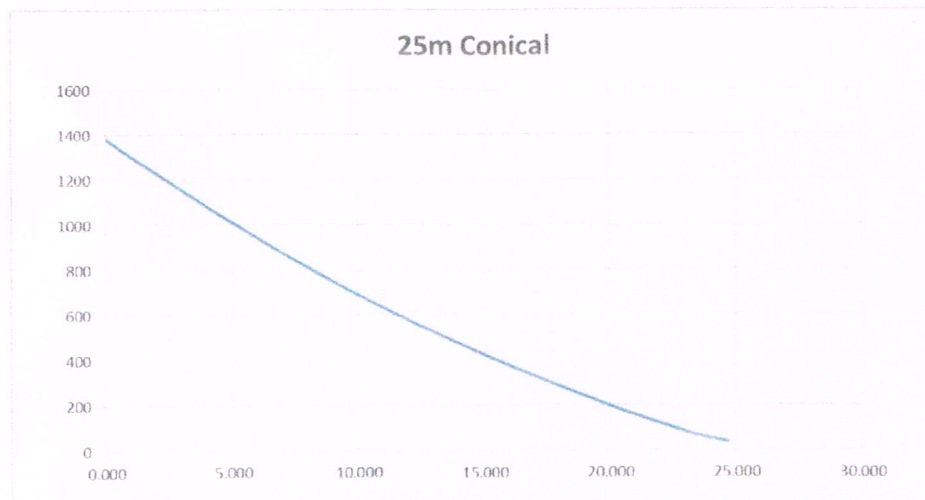


Figure 33 20m conical tower bending load distribution

Table 34 25m conical foundation loads

Maximum Tower base loads	Sensor		LPSF 1.35
Tower bending (wind)	TwrBsMyt_[kN-m]	1022.80	1380.78
Horizontal shear Force (wind)	TwrBsFxt_[kN]	58.56	79.06
Vertical (weight)	TwrBsFzt_[kN]	72.66	

Opgave door leverancier : Maximum tower deflection : 159 mm. (Bigger base diameter)