

**Aeronautica 47-500/750 kW****Foundation loads****50 m hub high****Wind class: IEC-IB  
Row configuration****Extreme loads on foundation (bottom flange of tower):****Notice!**

All extreme loads are **including** a load safety factor of: 1.35  
 Except for tower and nacelle mass which includes a safety factor of: 0.90

App. nacelle mass kg: 37000  
 App. tower mass kg: 33000  
 Total mass incl. safety factor: 70000

**Extreme loads including above safety factors:**

Horizontal force [kN]:	516
Bending moment [kNm]:	19130
Vertical force [kN]:	577
Torsional torque [kNm]:	896

**Equivalent fatigue loads on foundation (bottom flange on tower):**

Equiv. load ranges for diff. cycle numbers m - denotes the S/N - curve slope  
 The following fatigue loads, should be taken into consideration at the same time:

**Vertical force (F<sub>xT</sub>):**

N-ref: 2.48E+08

m	N-ref	N=10E7	N=10E6
3	29.29	85.43	184.06
4	27.81	62.07	110.38
6	28.16	48.10	70.60
8	29.63	44.26	59.02
10	31.27	43.11	54.27
12	32.85	42.93	52.01

**Torsional torque (M<sub>xT</sub>):**

N-ref: 7.44E+08

m	N-ref	N=10E7	N=10E6
3	185.54	780.51	1681.57
4	202.89	595.96	1059.79
6	238.23	488.61	717.18
8	271.76	465.75	621.09
10	302.78	465.92	586.55
12	331.41	474.63	575.02

**Horizontal force (F<sub>zh0</sub>):**

N-ref: 2.48E+08

m	N-ref	N=10E7	N=10E6
3	31.38	91.55	197.23
4	35.02	78.18	139.03
6	42.59	72.73	106.76
8	49.52	73.99	98.67
10	55.74	76.85	96.73
12	61.28	80.08	97.02

**Bending (M<sub>yh0</sub>):**

N-ref: 2.48E+08

m	N-ref	N=10E7	N=10E6
3	1204.47	3513.08	7568.70
4	1375.07	3068.98	5457.51
6	1709.26	2919.14	4284.71
8	2007.73	2999.45	3999.82
10	2269.10	3128.39	3938.41
12	2496.94	3263.10	3953.34

**Lines of direction for stiffness properties of foundation:**

The foundation should as a minimum have a stiffness equal to a beam of length 2 meter, fixed in one end and with the minimum stiffness properties:

$$EI : 7.20E+10 \text{ Nm}^2$$