



REGIONE AUTONOMA DELLA SARDEGNA
PROVINCIA DI SASSARI
Comuni di:



Buddusò



Pattada

REALIZZAZIONE DI UN PARCO EOLICO NEI COMUNI DI
BUDDUSÒ E PATTADA COSTITUITO DA 12 AEROGENERATORI DI
6,6 MW CIASCUNO E POTENZA COMPLESSIVA PARI A 79,2 MW

VALUTAZIONE D'IMPATTO AMBIENTALE

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Estimated Foundation Design T135-54A

SG 6.6-170

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1. Purpose

This document presents the estimated foundation design dimensions for SG 6.6-170 T135-54A based on the foundation design loads summarized in [Ref 1]

2. Soil properties

Phreatic level	NO
Backfill soil density [kg/m ³]	1800
Bearing capacity [kg/cm ²]	6
Bearing capacity SF for extreme factored loads	2
Friction angle [°]	30
Static elastic module [MPa]	75
Dynamic elastic module [MPa]	200
Poisson coefficient	0.3

3. Concrete material properties

	CLEANING CONCRETE	SLAB CONCRETE	PEDESTAL CONCRETE
Concrete type	C20/25	C35/45	C50/60
Density [kg/m ³]	2500	2500	2500
fck [MPa]	20	35	50
Arid max. size [mm]	20	20	20
Elastic module [MPa]	29961.95	34077.14	37277.87
Poisson coefficient	0.20	0.2	0.2
Thickness [m]	0.10		

4. Steel material properties

Type	B500S
Density [kg/m ³]	7850
fyk [MPa]	500
Elastic module [MPa]	200000
Covering [mm]	50

5. Material safety factors

Concrete	1.5
Steel	1.15

6. Foundation pre-dimensioning

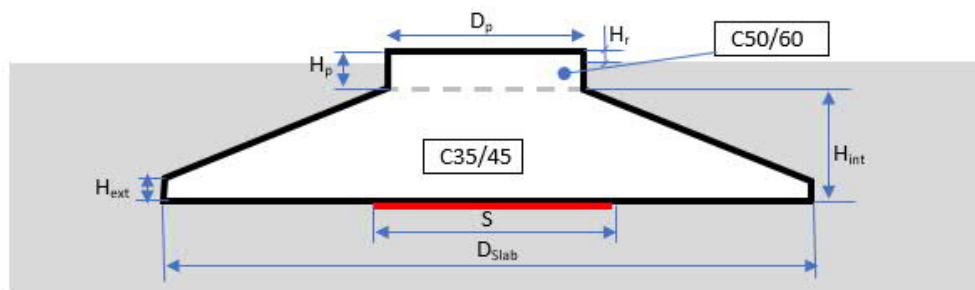
The verifications carried out to establish the pre-dimensioning values of the foundation are:

Verification	SF	Load type considered
Overtuning	1.52	Extreme factored loads
Sliding	10.48	Extreme factored loads
Soil bearing capacity	1.01	Extreme factored loads
Settlement	2.26	Characteristic loads
GAP COG	1.78	Characteristic loads
GAP 100%	1.00	Quasi permanent loads
Rotational Stiffness	2.20	Quasi permanent loads

* Peak pressure at the bottom of the foundation is 3.33 kg/cm²

7. Geometry definition

Main dimensions of the foundation:



D _{slab} [m]	24.3
H _{ext} [m]	0.5
H _{int} [m]	3.0
D _p [m]	6.3
H _p [m]	0.6
H _r [m]	0.1
S [m]	8.5

This foundation design needs 3500mm bolts length.

8. Bill of materials

Calculating the quantities requires some assumptions as:

- Anchored bolts interface has not been considered. Grout quantity, anchor bolts and templates are not included in the estimation.
- Calculating the reinforcement of anchor bolt interface is preformed according to other previous designs, medium diameter in tower base and bending moment.

Concrete [m ³]	763.24
Slab reinforcement steel [kg]	63589
Interface/pedestal reinforcement steel [kg]	20820
Total reinforcement steel [kg]	84408
Excavation [m ³]	2673
Backfill compaction [m ³]	1867
Formwork [m ²]	38.2
Cleaning concrete [m ³]	46.38
Soft soil area (EPS) [m ²]	56.75

9. Masses & moment of inertia of foundation

Mass of Concrete [kg]	1908093.4
Mass of stabilizing Backfill [kg]	1553533.3
Foundation Inertia X [kg m ²]	138766597.3
Foundation Inertia Y [kg m ²]	138766597.3
Foundation Inertia Z [kg m ²]	243887177.7

10. Appendices

Appendix No	Title
[Ref 1]	D2916870_PCD SG 6.6-170 Foundation loads T135-54A

11. Abbreviations and definitions

Abbreviation	Description
D _{slab}	Diameter of the Slab
H _{ext}	Outer edge height
H _{int}	Inner edge height
D _p	Pedestal diameter
H _p	Pedestal height
H _r	Pedestal height over ground level
S	Diameter of soft soil (EPS)