

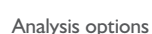
CADS Bearing Pile Designer helps engineers to investigate the effects of soil parameters and different pile types to select a suitable pile type for known soil strata. A simple program for checking the bearing capacity of individual piles and groups of piles of various lengths and types, including bored piles, continuous flight auger (CFA) piles, driven cast in place, driven tubular steel, driven steel H piles and driven precast piles. A “Pile Length Calculator” can also be used to calculate the required length of pile for a given diameter/section size and required compression and tension capacity.

- Eurocode 2, 3 & 7 and British Standards 8004:2015
- Bearing pile capacity checks
- Individual and groups of piles
- Calculate pile length
- Various analysis options
- Working platform thickness design
- Specify soil layers and water table
- Soils generator based on standard borehole descriptions
- Lateral load analysis included
- Graphical and tabular output
- Comprehensive printouts



Analysis options

1. The analysis options dialog showing the Factors of Safety tab.
2. Carry out ultimate limit state type calculations.
3. The theoretical unit shaft and end bearing resistances calculated using the program can be checked against maximum limit values specified in the Capacity Limits tab.
4. The software automatically generates many of the necessary design coefficients from values given in standard texts.
5. Skin Friction tab.



The pile forces obtained from the lateral load analysis (or an external source) can be used to design the shaft of the pile. Concrete piles are checked against Eurocode 2, Eurocode 7 and BS8004:2015. Steel piles are checked against Eurocode 3, Eurocode 7 and BS8004:2015. The results of the design checks are displayed in a simple summary which is colour coded to indicate pass or fail of each check.

The software includes a new module to check the thickness of working platforms for plant (including piling rigs, crawler cranes and mobile crane outriggers). This new module incorporates a range of analysis types so that the user can assess the thickness required by each method of analysis and select an appropriate thickness of mat to provide.

CADS Bearing Pile Designer - Version 2.01 Pile geotechnical analysis, pile shaft design and working platform design	Page No 2 Analysis
	Project File Name untitled
	Engineer Date 10/04/2010

Working Platform - Tabulated Calculations

[illegible]

Phi Factor	1.00
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[illegible]

Working Platform - Thickness Summary

Method description	Platform
Enurocode 7, Design Approach 1, Combination 1	Depth
Enurocode 7, Design Approach 1, Combination 2	280 mm
BRE 470 method (with EC7 Kp derivation)	1050 mm
Lumped FOS with vertical platform shear	490 mm
Lumped FOS with load spread angled at 2V:1H	280 mm
Lumped FOS with load spread angled at 1V:1H	190 mm
Minimum platform depth (300mm or 1/2 width)	300 mm

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	Engineer Date 10/04/2019

Working Platform - Tabulated Calculations

	E07	C07	E07	C07	BRE	BRE	Vent	Angle	Angle	Angle	
	C1	C1	C2	C2	L07	L07	Shear	2V-1H	2V-1H	1V-1H	
	L01	L01	L01	L01	L01	L01	L01	L01	L01	L01	
Platform Depth (mm)	200	280	500	540	1030	1050	430	490	250	170	190
Characteristic Bearing (kN/mm2)	200	280	250	260	250	250	250	360	250	360	360
Load Width (mm)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Load Length (mm)	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
Design Load (kN)	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
Design Length (mm)	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.75	2.28	2.84	2.38
Load Factor	1.50	1.30	1.30	1.00	1.60	1.20	2.50	2.50	2.50	2.50	2.50
Design Section Modulus (kNm/m2)	7.49	4.57	4.88	3.60	10.00	6.40	25.00	25.00	25.00	25.00	25.00

Phi Factor	1.00
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[illegible]

Working Platform - Thickness Summary

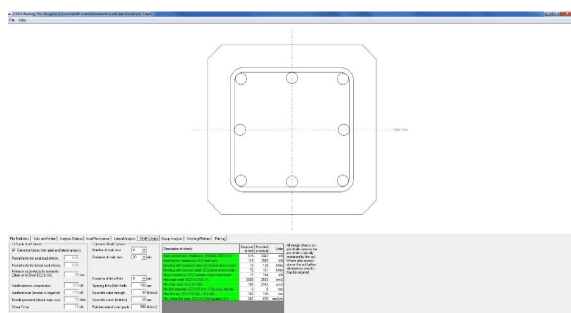
Method description	Platform
Eurocode 7, Design Approach 1, Combination 1	280 mm
Eurocode 7, Design Approach 1, Combination 2	60 mm
BRE 470 method (with EC7 Kp derivation)	1050 mm
Lumped FOS with vertical platform shear	490 mm
Lumped FOS with load spread angled at 2V:1H	280 mm
Lumped FOS with load spread angled at 1V:1H	190 mm
Minimum platform depth (300mm or 1/2 width)	300 mm

Working platform results

Soils

Multiple soil layers and the water table can be input at defined levels, each soil layer can be specified as:

1. Granular Phi – granular soils with shear strength based on Phi values (angle of internal friction)
2. Granular SPT – granular soils with shear strength based on SPT values (standard penetration test)
3. Undrained – cohesive soils with shear strength based on cohesion alone
4. Drained – cohesive soils with both cohesion and phi values defined
5. Chalk – special class with the strength defined by SPT values



Precast concrete pile design checks

Graphical output




































The graphical output displays the variation of pile capacities with depth for ultimate shaft resistance, end bearing resistance and design compression/tension resistance.

Tabular output

Results can also be viewed in a table which details values at 0.25m intervals unless otherwise specified by the user. These values include vertical overburden and water pressure, the effective vertical stress, the internal friction angle (Phi), cohesion, SPT and pile capacity values.

Group analysis

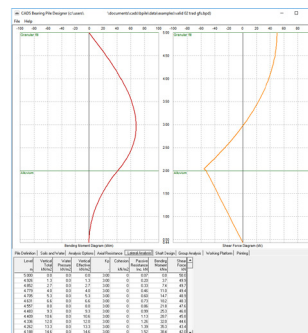
Pile groups of 2 to 9 piles plus an “infinite” option can be prescribed along with the minimum pile spacing to calculate the overall group capacity. The load resistance calculation of the group follows similar calculation methods to those used for single pile analysis. An additional check for soil weight resistance is included. The perimeter and base areas of groups of known size are easily determined from basic geometry. For infinite groups, the group checks are carried out on an individual pile within the infinite group. In the ultimate values, negative skin friction is included as well as soil strength factors. Numerical results provided include the ultimate bearing and compression resistance, design tension capacity as well as a set of values for an equivalent single pile.

Pre-Definition	Soils and Water	Analysis Options	Axial Resistance	Lateral Analysis	Shaft Design	Group Analysis	Working Plans	Piling
File spacing (centres) 3000 mm				Group tension partial factor Partial factor on soil weight to resist group tension: 1.20		Group analysis results for (whole group)		
Two piles  				Enable edited only if custom partial factors selected:		Ultimate base bearing resistance 9344 kN		
Three piles   				Pile group perimeter friction		Ultimate perimeter resistance 14666 kN		
Four piles    				<input checked="" type="radio"/> Perimeter friction calculations assume shear through soil (Delta=Phi and Alpha=1)		Minimum pull-out soil weight 2344 kN		
Five piles     				<input type="radio"/> Perimeter friction values as for pile shaft friction		Maximum pull-out soil weight 9893 kN		
Six piles      						Design compression resistance 3604 kN		
Seven piles       						Design tension resistance 6842 kN		
Eight piles        						Equivalent single pile result:		
						Design compression resistance 298 kN		
						Design tension resistance 303 kN		

Group Analysis

Pile Definition	Soils and Water	Analysis Options	Axial Resistance	Lateral Analysis	Shaft Design	Group Analysis	Working Platform	Pinning
Pile type <input type="radio"/> Bored <input type="radio"/> CFA <input type="radio"/> Driven tubular steel <input type="radio"/> Driven steel H <input checked="" type="radio"/> Driven precast	Pile geometry Pile Head Level (load level) 5.00 m Pile Toe Level -10.00 m Pile Length 15.00 m			Applied loads (unfactored actions) Vertical Compression 500 kN Vertical Tension 100 kN Lateral Load 50 kN				
Pile shaft dimensions Pile side dim. 300 mm	Editing the levels will alter the pile length. Editing the pile length will alter the toe level. The pile head level is not permitted to be below the top soil level. <input type="button" value="Calculate pile length to resist axial loads"/>							
Fixed head analysis <input type="checkbox"/> Moment Load 0 kNm If the pile head is fixed no moment can be applied. Negative applied forces and moments are not supported.								

Pile definition



Analysis results