BSP CASED PILES DATA SHEETS Note No. CP25

BSP CASED PILES - BASE DRIVING WITH AN INTERNAL DROP HAMMER ESTIMATION OF DRIVING RESISTANCE

The following empirical dynamic formula is based on the results of experience to date:

$R_u = 290W(1.0 + h)/(S + 12.7)$

where

R_u = Ultimate driving resistance (tonnes)
W = Weight of internal drop hammer (tonnes)
h = ACTUAL drop at final set (metres)
S = Final set (millimetres per blow)

The formula is APPLICABLE ONLY FOR:

(i) Drops between 1.2 and 2 metres (vertical piles)

(ii) Sets less than 5mm per blow (i.e. more than 5 blows per 25mm)

NOTES

1. This formula should be used only for piles driven to soils such as sand, gravel, rock, hard marl, or very stiff clay.
2. A re-drive test should be carried out to confirm that the set on re-driving is not greater than at final set on the first drive (See BSP Note No. CP38).
3. The Formula stated above is only applicable where the driving has been carried out exactly in accordance with the recommendations set out in the latest issue of BSP Note No. CP3 'Installation of Casings'.
4. When measuring the final set for application of the formula, it is essential to ensure that the hammer rope is not 'snatched' before the hammer has completed its full drop - otherwise the hammer energy transmitted to the pile is reduced and the formula will give an incorrect and unsafe result.
5. The formula stated above is applicable to vertical piles and in the case of raking piles an appropriate adjustment to the value of the set and/or drop should be made.
6. Owing to the limitations of dynamic pile driving formulae it is generally advisable to test load one or more piles (depending on the size of the contract), particularly when the piles are founded in soils such as stiff clay, chalk, etc.
7. Refer to BSP Note No. CP3 Para. 9 regarding uplifting of piles.
8. Separate checks should be made regarding matters such as the overall stability of the whole group of piles supporting a structure, the possibility of settlement due to a soft stratum existing below the piles, negative friction due to consolidation of an upper soft stratum, and so on. (Refer to Code of Practice 'Foundations'- British Standards Institution.)

Note No. CP26

The table below is based on the empirical dynamic formula in CP 25 which must be referred to. The details given on this sheet are only applicable under the certain definite conditions stated on CP25.

Dia.	Working Loads (Tonnes)	Hammer W (t)	Drop h (m)	Ultimate Driving Resist. R_u (t)	
				5 Blows/ 25mm S=5mm	10 Blows/ 25mm S=2.5mm
254	15-(20)	0.75	1.20 1.50 1.80	27 31 34	31 36 40
305	30-(35)	1.25	1.20 1.50 1.80	45 51 57	52 60 67
356	40-(50)	2	1.20 1.50 1.80	72 82 92	84 95 107
406	50-(60)	2.5	1.20 1.50 1.80	90 102 115	105 120 134
457	65-(80)	3	1.20 1.50 1.80	108 123 138	126 143 161
508	80-(100)	4	1.20 1.50 1.80	144 164 184	168 191 214
559	100-(125)	5	1.20 1.50 1.80	180 205 229	210 238 267
610	120-(150)	6	1.20 1.50 1.80	216 246 275	252 286 321

Notes

1. Figures in brackets (---) are applicable for piles founded in rock, dense sand or gravel, very hard marl or hard shale.
2. Working load is obtained by dividing R_u (Ultimate Driving Resistance) by Factor of Safety, which is normally 2.

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