

**Project abstract**  
**Derivation of correlation factors and partial safety factors**  
**for pile resistances from results of load tests**  
**and empirical values for the Eurocode EC 7-1**  
**- Calibration on the previous German safety standard -**  
**(Reference number: ZP 52-5- 11.72-1272/07)**

Pile resistances at the ultimate limit state can be derived according to Eurocode EC 7-1 (DIN EN 1997-1) from the results of load tests (EC 7-1, e.g. equation 7.2) or on the basis of empirical values (EC 7-1, e.g. equation 7.9).

When defining characteristic resistances of load tests, the measured values are attenuated by the correlation factors  $\xi$ . This approach is considerably different from the concept of global safety according to DIN 1054: 1976-11. If the values recommended in EC 7-1 Table A9 are applied in this regard, then a clearly higher security level will be the result - except for a few special cases - and thus more inefficient construction methods than this was the case with the previous national regulations. The values recommended in Table A.9 may, however, be adapted in the framework of national application rules to national safety standards.

The object of the research project was to calibrate and nationally adapt the partial safety factor and correlation factor for the Eurocode EC 7-1, chapter 7 so that by its using the previous safety standards and the economy will to a large extent be maintained. For this purpose extensive comparison calculations with variation of parameters were carried out on fictitious load test results. The partial safety factors and correlation factors were then verified by numerous static and dynamic load test results of different pile systems archived at the Kassel University.

In the framework of the research project the partial safety factors and correlation factors were therefore nationally adapted so that with the implementation of Eurocode EC 7-1 a somewhat comparable security level will result for the decisive correlation areas of test load results, just as according to the corresponding regulations of DIN 1054:1976 and/or DIN 1054:2005. Deviations from that are the result of a basically different procedure given in the old and new standards and are therefore unavoidable. However, differences could be minimised by the optimisations resulting from the research project.

Comparative investigations were also carried out to derive characteristic pile resistances from empirical values.

Drafted by order of Deutsches Institut für Bautechnik (DIBt)  
Department Geotechnics, Kassel University, Prof. Dr.-Ing. H.-G Kempfert, Dipl.-Ing. F. Hörtkorn, Dipl.-  
Ing. P. Becker