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ANALYSIS OF INACCURACY INFLUENCE ON INTERPRETATION OF Q-S CURVE RESULTS WITHIN THE EXECUTION OF STATIC PILE LOAD TESTS

ABSTRACT

The dissertation presents an analysis of the influence of the assumed uncertainty on the interpretation of the results of the Q-s curve. The literature review (Chapter 3) includes the most commonly used methods of interpreting the results of static pile tests, i.e. Q-s curves, the current approach to the uncertainty of the results of static pile tests was also described. On the basis of the analysis, a method that would allow the analysis of the impact of uncertainty on the interpretation of the Q-s curve was selected. It was decided to use the Meyer-Kowalow curve (M-K curve). Chapter 4 presents the analysis of the pile-soil cooperation phenomenon, the selected method (M-K curve) is discussed in detail, and the method of taking into account the assumed uncertainties in the model and the set of points $\{N_i, s_i\}$ measured in the static test is presented. Two types of errors were specified, which are a further part of the analysis in the dissertation, i.e. error s_0 (adjustment of the soil to the pile in the initial stage of loading) and s_k (error resulting from the lifting of anchor piles). In Chapter 5, the selected method was verified using the results obtained during experimental tests, based on the analysis of the results of static tests of large-diameter piles loaded until uncontrolled settlement of the structural element was obtained. Calculations with the M-K model were performed on shortened sets $\{N_i, s_i\}$ and compared with the results of experimental studies. the obtained results allow for stating the high accuracy of the model for piles loaded under real conditions. Then, in Chapter 6, analytical tests were carried out based on the results of available real static tests performed in a small settlement range. Examples illustrating the influence of errors on the results of the interpretation of the Q-s curve are presented. A total number of 61 piles in the small settlement range were analyzed. Then, a statistical analysis of the obtained results and changes in the values of the M-K curve parameters was performed. The issues of changing the parameters of the M-K curve in terms of pile construction technology and the impact of error on the distribution of load-bearing components were also discussed. Based on the research carried out, Chapter 7 presents the practical application of the results. The

relationship of the M-K curve for high loads, the safety factor and the calculation procedure based on the procedure presented in the dissertation are presented. Chapter 8 presents a summary of the research, conclusions and the agenda for further research.

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