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TITLE OF DIPLOMA THESIS:

Risk analysis of diaphragmatics retaining structures

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ABSTRACT

In the ensuing dissertation a methodology of estimate a risk analysis of diaphragmatics retaining structures is mentioned. This estimate is realised via the determination of the reliability index β and the corresponding probabilities of failure P_f . In the framework of Risk Management of geotechnical projects, the problem of the most optimal planning is studied with final aim the reduction of the constructional cost for their entire circle of life. The study being realised is based on the determination of the reliability of a diaphragmatic retaining structure with strut. The uncertain soil parameter that influences considerably the results of the probabilistic analysis of the project is found and the course with which the reliability index and the probability of failure are calculated is presented via the approximating method Point Estimate (PEM). In order to take into account the variability of value of the uncertain soil parameter, after the localisation and the configuration of the limit state functions, the mean value and the standard deviation of the stochastic figure are calculated via method PEM. Subsequently the process is repeated and the system is solved once with the conventional Method of Catholic factor of safety and the second time with the Eurocode 7. After that the influence that can cause per case in a retaining structure with strut, the failures against inversion and against horizontal forces are studied with probabilistic analysis. Finally, the diaphragmatic retaining structure is analyzed as a linear system and the total probability of failure is calculated. In conclusion, the calculation of the total probability of failure per case and the comparative presentation yielded a fuller picture of the designing of the project so it is proved that the reliability analysis is necessary in order to be designed the most economic and safe structure.



KEYWORDS

Diaphragmatic Retaining Structure, Strut, Point Estimate Method, Probability of failure P_f , Reliability index β