

COLLABORATIVE RESEARCH CENTER 837

INTERACTION MODELING IN MECHANIZED TUNNELING

RUB

RELIABILITY ANALYSIS OF GEOTECHNICAL SYSTEMS

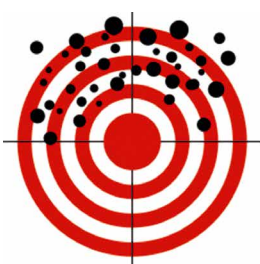
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The properties of natural soil are inherently variable and influence design decisions in geotechnical engineering. Apart from the inherent variability of the soil, the variability may arise due to measurement of soil properties in the field or laboratory tests and model errors. These wide ranges of variability in soil are expressed in terms of mean, variance and autocorrelation function using probability/reliability based

models. The most common term used in reliability based design is the reliability index, which is a probabilistic measure of assurance of performance of structure. The main objective of the reliability based design is to quantify probability of failure/reliability of a geotechnical system considering variability in the design parameters and associated safety. The presentation highlights the importance of reliability based design methodologies of different geotechnical systems such as shallow foundations, pile foundations, retaining walls, unsaturated slopes, piping in dams as well as pavements, municipal solid waste landfills. A number of techniques and concepts such as random fields, inverse reliability based optimization; response surface methods, time dependent reliability etc have been used to bring out the significance of consideration of variability in soil parameters in the design and analysis of geotechnical systems.



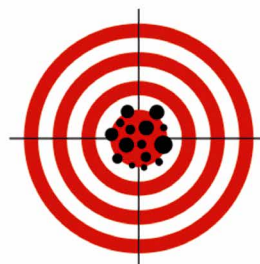
Unreliable & Invalid



Unreliable, But Valid



Reliable, Not Valid



Both Reliable & Valid

Guests are welcome!