

Risk Assessment in Geotechnical Engineering

By Gordon A. Fenton, D. V. Griffiths

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NEW PROBABILISTIC APPROACHES FOR REALISTIC RISK ASSESSMENT IN GEOTECHNICAL ENGINEERING.

This text presents a thorough examination of the theories and methodologies available for risk assessment in geotechnical engineering, spanning the full range from established single-variable and "first order" methods to the most recent, advanced numerical developments. In response to the growing application of LRFD methodologies in geotechnical design, coupled with increased demand for risk assessments from clients ranging from regulatory agencies to insurance companies, authors Fenton and Griffiths have introduced an innovative reliability-based risk assessment method, the Random Finite Element Method (RFEM). The authors have spent more than fifteen years developing this statistically based method for modeling the real spatial variability of soils and rocks. As demonstrated in the book, RFEM performs better in real-world applications than traditional risk assessment tools that do not properly account for the spatial variability of geomaterials.

This text is divided into two parts:

Part One, Theory, explains the theory underlying risk assessment methods in geotechnical engineering. This part's seven chapters feature more than 100 worked examples, enabling you to develop a detailed understanding of the methods.

Part Two, Practice, demonstrates how to use advanced probabilistic tools for several classical geotechnical engineering applications. Working with the RFEM, the authors show how to assess risk in problems familiar to all geotechnical engineers.

All the programs used for the geotechnical applications discussed in Part Two may be downloaded from the authors' Web site at www.engmath.dal.ca/rfem/ at no charge, enabling you to duplicate the authors' results and experiment with your own data. In short, you get all the theory and practical guidance you need to apply the most advanced probabilistic approaches for managing uncertainty in

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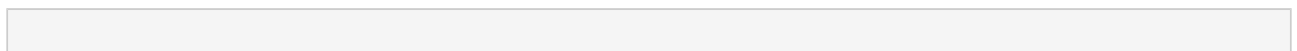
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Editorial Review

Review

"The publication presents an examination of the theories and methodologies available for risk assessment in geotechnical engineering, spanning the full range from established single-variable and "first order" methods to the most recent, advanced numerical developments. In response to the growing application of LRFD methodologies in geotechnical design, coupled with increased demand for risk assessments by clients ranging from regulatory agencies to insurance companies, the authors have introduced an innovative reliability-based risk assessment method, the Random Finite Element Method (RFEM). The authors have spent more than fifteen years developing this statistically based method for modeling the real spatial variability of soils and rocks." (*MCEER, Information Service*, January 5, 2009)

From the Back Cover

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About the Author

Gordon A. Fenton, PhD, PEng, is a Professor in the Department of Engineering Mathematics at Dalhousie University, Halifax, Nova Scotia. He is a core member and past chair of the American Society of Civil Engineers Geo-Institute Risk Assessment and Management Committee. He is also a core member, past acting chair, and secretary of the International Society of Soil Mechanics and Geotechnical Engineering Risk

Assessment and Management Committee. Finally, he serves on the Canadian Highway Bridge Design Code Foundations Committee and is currently developing reliability-based geotechnical design provisions for the next edition of that code.

D. V. Griffiths, PhD, DSc, PE, is Professor of Civil Engineering at the Colorado School of Mines. He is a Fellow and Governor of the American Society of Civil Engineers and a member of the British Institution of Civil Engineers. He is the coauthor (with I.M. Smith) of two successful texts, *Programming the Finite Element Method*, Fourth Edition (Wiley) and *Numerical Methods for Engineers*, Second Edition.

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