

IGS/British Geotechnical Association joint meeting
6.00 pm Wednesday 13th October 2010

**INSTITUTION OF CIVIL ENGINEERS 1 GREAT GEORGE STREET, WESTMINSTER,
LONDON SW1P 3AA**

RECENT DEVELOPMENTS IN REINFORCED SOIL WALL TECHNOLOGIES

**Dr. Richard Bathurst
Queen's-RMC, Kingston, Ontario, Canada**

Reinforced soil walls including structures with steel and geosynthetic reinforcing elements are now well-established technologies. Nevertheless, there remain questions regarding the accuracy of current internal stability analyses of geosynthetic reinforced soil walls that are based on limit equilibrium concepts. The accuracy of strength-based methods of analysis for reinforcement rupture and pullout design of walls under operational conditions has become an issue in North America as design practice moves to limit states design based on rigorous calibration using reliability theory. Measured and predicted reinforcement loads using current tie-back methods are compared and predicted values shown to be very poor on average for geosynthetic reinforced soil walls but reasonably accurate for steel reinforced soil walls. Sources of poor prediction accuracy are identified using results of instrumented full-scale walls and numerical modeling. The essential features of a new empirical-based working stress design method (K-stiffness Method) are presented. This new method explicitly includes the influence of reinforcement stiffness (steel and geosynthetics) and the structural facing amongst other contributions. The talk will also include examples of new reinforced soil wall technologies in North America and Asia as well as new test methods and interpretation for the quantification of facing component performance and reinforcement strength limit states.

Biography:

Dr. Bathurst is Professor of Civil Engineering at the GeoEngineering Centre at Queen's-RMC in Kingston, Ontario, Canada. He is the author of the chapter on geosynthetics in the 4th Edition of the Canadian Foundation Engineering Manual, co-author of the First Edition of the National Concrete Masonry Association (NCMA) Manual for Segmental Wall Design and Construction, author of the NCMA Seismic Design Supplement for Segmental Retaining Walls, co-author of Transportation Research Board Circular E-C079 on limit states design calibration and, co-author of two chapters of books describing reinforced soil wall technologies. In addition, he has acted as a consultant to many of the major players in the geosynthetics industry in North America. Dr. Bathurst has been awarded numerous research grants and has authored or co-authored more than 300 papers, the majority in the area of the reinforced soil technologies. He has been an invited keynote speaker at international conferences. He has received the International Geosynthetics Society Gold Medal Award twice, the R.M. Quigley Award of the Canadian Geotechnical Society (CGS) three times, the Gzowski Medal of the Canadian Society for Civil Engineering twice (the oldest engineering medal in Canada) and the Geosynthetics Division Award of the CGS. Dr. Bathurst is a Past-President of the International Geosynthetics Society, a Past-President of the North American Geosynthetics Society and an elected fellow of the Engineering Institute of Canada and Canadian Academy of Engineering. Dr. Bathurst is the Editor of the technical journal Geosynthetics International published by Thomas Telford.

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