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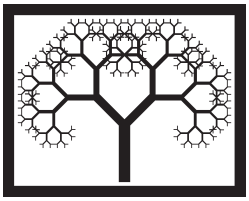

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Contents

Preface

This volume comprises the extended abstracts of contributed papers presented at The Eighth International Conference on Civil and Structural Engineering Computing (Civil-Comp 2001). The full papers from the conference are available on the accompanying CD-ROM. The conference was held concurrently with The Sixth International Conference on the Application of Artificial Intelligence to Civil and Structural Engineering (AICivil-Comp 2001) in Eisenstadt, Austria, from 19 to 21 September 2001. These conferences are part of the Civil-Comp series that commenced in 1983.

The topics covered in these Proceedings are wide ranging and demonstrate the extensive use of computing in civil and structural engineering. They have been classified as:

- Internet Applications in Civil and Structural Engineering
- Information Technology in Civil and Structural Engineering
- Construction Management and Construction Engineering
- Computer Aided Design
- Software Development
- Data Acquisition, Monitoring and Control
- Computers in Structural Analysis
- Computers in Structural Engineering Design
- Analysis and Design of Tension Structures
- Structural Analysis: Buckling & Stability Computations
- Structural Analysis: Dynamic Computations
- Earthquake and Seismic Computations
- Analysis and Design of Steel Structures
- Analysis and Design of Connections and Fasteners
- Analysis and Design of Reinforced Concrete Structures
- Computational Modelling of Composite Materials and Structures
- Fire Resistance of Structures
- Finite Element Methods in Civil and Structural Engineering
- Wave Propagation Problems
- Non-Linear Analysis
- Computational Mechanics
- Parallel and Distributed Computations
- Structural Optimisation
- Geotechnical Engineering: Information Technology
- Geotechnical Engineering: Analysis and Design
- Soil-Structure Interaction: Analysis and Modelling
- Water Engineering: Analysis and Design

I should like to thank all the authors and co-authors of the papers included in this volume of proceedings. I am especially grateful to those who took the time and made the effort to participate in Eisenstadt.

Finally, we should like to thank the members of the Conference Editorial Board for their help before and during the conference: Professor H. Adeli, USA; Dr T.J.A. Agar, UK; Professor N. Akkas, Turkey; Professor A.M. Alsugair, Saudi Arabia; Dr S.C. Anand, UK; Professor A.J. Aref, USA; Dr C.E. Augarde, UK; Professor M.R. Barnes, UK; Professor J.A.O. de Barros, Portugal; Professor R.C. Barros, Portugal; Professor J.W. Baugh Jr., USA; Dr. A.A. Becker, UK; Dr R. Beheshti, Netherlands; Dr. A. Bensalem, UK; Professor L.G. Bernold, USA; Dr P. Bhatt, UK; Professor D.A. Bradley, UK; Professor F.A. Branco, Portugal; Professor M. Bruneau, USA; Dr J.W. Bull, UK; Professor F. Cai, Japan; Professor A. Carpinteri, Italy; Professor S.L. Chan, Hong Kong; Professor Y.K. Chow, Singapore; Professor J. Christian, Canada; Professor D. Chua Kim Huat, Singapore; Dr R.S. Crouch, UK; Dr L. Davison, UK; Dr. R.A. Day, Australia; Dr. M.M. De Farias, Brazil; Professor G. Degrande, Belgium; Professor M.C. Deo, India; Dr E.A. Dickin, UK; Professor H.M. Elzarka, USA; Dr. O.O.R. Famiyesin, UK; Professor P. Fazio, Canada; Dr. W.J. Ferguson, UK; Professor F.C. Filippou, USA; Professor L. Fryba, Czech Republic; Professor H. Furuta, Japan; Dr. P. Gardner, UK; Dr F. Genna, Italy; Professor J. Gluck, Israel; Professor R.S. Govindaraju, USA; Professor W.J. Greney, USA; Professor D.E. Grierson, Canada; Professor P. Hajela, USA; Professor N.B. Harmancioglu, Turkey; Professor T. Hegazy, Canada; Professor B.G. Heydecker, UK; Dr M. Hirokane, Japan; Professor G. Hofstetter, Austria; Dr. G.D. Holt, UK; Dr J. Hoybye, Sweden; Professor S.L. Hung, Taiwan; Professor P. Jayachandran, USA; Dr. D.S. Jeng, Australia; Professor X. Jia, USA; K. Kahkonen, Finland; Professor E.S. Kameshki, Bahrain; Dr R. Karoumi, Sweden; Professor A. Kaveh, Iran; Professor T. Kerh, Taiwan; Dr A.I. Khan, Australia; Professor V.K. Koumousis, Greece; Dr B. Kumar, UK; Dr A.S.K. Kwan, UK; Dr. A.K.H Kwan, Hong Kong; Professor K.H. Law, USA; Professor D. Le Houedec, France; Dr I.D. Lefas, Greece; Dr. C.J. Leo, Australia; Professor R Levy, Israel; Professor Heng Li, Hong Kong; Professor Shie-Yui Liong, Singapore; Dr. G.H. Little, UK; Dr. P.E.D. Love, Australia; Dr. G.W. Ma, Singapore; Dr R.I. Mackie, UK; Professor M.K.S. Madugula, Canada; Professor Dr. K. Marti, Germany; Professor I. May, UK; Professor P.H. McDonald, USA; Dr J. Miles, UK; Professor S.A. Mirza, Canada; Professor A. Miyamoto, Japan; Professor A. Miyamura, Japan; Professor G. Muscolino, Italy; Dr A. Nadjai, UK; Dr. P.O. Olomolaiye, UK; Dr K. Orsborn, USA; Professor M. Papadrakakis, Greece; Professor M. Pastor, Spain; Professor M.N. Pavlovic, UK; Professor S. Pietruszczak, Canada; Professor A.A. Ramezanianpour, Iran; Professor M. Raoof, UK; Professor R. Rikards, Latvia; Dr S.G. Ritchie, USA; Professor M.L. Romero, Spain; Professor C.T.F. Ross, UK; Dr S. Rowlinson, Hong Kong; Professor R.L. Sack, USA; Professor M.P. Saka, Bahrain; Professor A. Samartin, Spain; Professor A. Scanlon, USA; Professor K. Schilling, Germany; Professor J.J. Shi, USA; Professor L.M.C. Simoes, Portugal; Professor S. Singh, USA; Professor V.P. Singh, USA; Professor M. Skitmore, UK; Professor J.E. Souza de Cursi, France; Dr R. Spallino, Germany; Professor B. Stok, Slovenia; Dr N.K. Subedi, UK; D. Taffs, UK; Professor J.H.M. Tah, UK; Professor A.B. Templeman, UK; Professor David Thambiratnam, Australia; Professor G. Thierauf, Germany; Professor H.R. Thomas, UK; Dr D.G. Toll, UK; Dr G.J. Turvey, UK; Professor M. Walker, South Africa; Professor J. Wang, China; Dr Peter K.

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Other papers presented at the conferences in 2001 have been published as follows:

- *The Contributed Papers from AICivil-Comp 2001 are published in:* Proceedings of the Sixth International Conference on the Application of Artificial Intelligence to Civil and Structural Engineering Computing, B.H.V. Topping and B. Kumar (Editor), (Book of Abstracts and CD-ROM), Civil-Comp Press, Stirling, Scotland, 2001.

- *The Special Lectures from Civil-Comp 2001 and AICivil-Comp 2001 are published in:* Civil and Structural Engineering Computing: 2001, B.H.V. Topping (Editor), Saxe-Coburg Publications, Stirling, Scotland, 2001.

These Conferences could not have been organised without the contribution of many who helped in their planning, organisation and execution. I should like to thank Professor David Toll who helped in formulation of the conference themes. I am grateful to Dr Martin Sales who suggested Eisenstadt as the venue for these conferences. Thanks are also due to all at Saxe-Coburg Publications: Civil-Comp Ltd for their help and perseverance in the realisation of these conferences, particularly Evelyn Armitt and Rosemary Brodie. The development of the new format and design of the Civil-Comp Conference Proceedings for 2001, including the CD-ROMs, required a major effort by Civil-Comp Ltd. This is the first major re-design and re-formatting of the Civil-Comp Conference Proceedings in over ten years and it has been undertaken and coordinated by Jelle Muylle. His skill, support and dedication during this radical change is greatly appreciated. The assistance of members of the Structural Engineering Computational Technology Research Group at Heriot-Watt University, Edinburgh is gratefully acknowledged especially from Roman Putanowicz, Péter Iványi and János Néző.

Barry H.V. Topping