

TABLE OF CONTENTS

Australian Centre for Geomechanics	iii
International Organising Committee	v
Technical Reviewers	vii
Preface	ix
Sponsors	xi

Section 1: Risk and Safety

Quality assurance in rockbolting using modern computerised equipment	3
M. Edhammer and H. Gustafsson, Atlas Copco Rock Drills AB, Sweden	
Considerations on the selection of rockbolts for rapid and secure mine development	9
F. Charette, DSI Mining, Canada	
Proposed training programme for shotcrete operators	21
A.J. Loncaric, StrataCrete Pty Ltd, Australia and B. Donnelly, Safe Mine Training, Australia	
Workforce exposure to rockfalls in underground mines	33
M.L. Owen, Owen Risk Engineering, Australia	

Section 2: Ground Support

Roofex™ – a new flexible rockbolting concept	49
E. Neugebauer, Atlas Copco Geotechnical, Drilling and Exploration, Austria	
Hydroscaling technology for rapid drift development	61
P.G. Dunn, Western Australian School of Mining, Curtin University, Australia	
Safer, deeper, faster: sprayed concrete – an integral component of development mining	69
M. Rispin, UGC International, BASF Construction Chemicals, Switzerland; D. Howard, Barmenco Mining Contractors and Consultants, Australia; O.B. Kleven, UGC International, BASF Construction Chemicals, Switzerland; K. Garshol, NAFTA, BASF Construction Chemicals, United States of America and J. Gelson, BASF Construction Chemicals, Australia	
Maturity and shotcrete strength for early re-entry	81
P. Dight, Australian Centre for Geomechanics, Australia and I.R. Hulls, Coffey Mining Pty Ltd, Australia	
Control and measurement of shotcrete thickness	101
A.J. Loncaric, StrataCrete Pty Ltd, Australia; A. Loomes, Underground Survey Services, Australia; J. Lett and J. Emmi, Newcrest Mining Ltd, Australia	
Surface support in extreme ground conditions – HEA Mesh™	111
Y. Potvin, Australian Centre for Geomechanics, Australia	
The impact of an unexpected fault zone and groundwater in a ramp development on cost and production rate – a case study	121
Y. Huang, Golder Associates Pty Ltd, Australia	

Section 3: Development Cycle

The advantages of mechanised cable bolting in the modern underground mine	131
K. Winder and B. Maney, Macmahon Mining Services, Australia	
Modern tools and equipment for tunnelling and drifting	139
H. Schunnesson, Luleå University of Technology, Sweden	
Key factors to consider before jumping head first into rapid mine drifting – is your operation ready?	149
G. Nord and P. Bray, Atlas Copco Rock Drills AB, Sweden	
Fully mechanised installation of high-tensile chain-link mesh for surface support in tunnels	165
R. Coates and S. Brown, ROCK (Australia) Engineering Pty Ltd, Australia; R. Bucher, Geobrugg Australia Pty Ltd, Australia; and A. Roth, Geobrugg AG Protection Systems, Switzerland	
Electronic detonators and the Gautrain rapid rail project	173
C.G. Goncalves, DetNet South Africa (Pty) Ltd, South Africa and V. Naidoo, African Explosives Ltd, South Africa	
Evolution of ground support practices within the development cycle at Perseverance Mine	181
J.F. Lessard and D. Heal, BHP Billiton Nickel West Pty Ltd, Australia	
Faster and better development in the LKAB Malmberget mine – results of a joint project from 2006–2007	199
G. Bäckblom, Nordic Rock Tech Centre AB, Sweden and O. Hedström, LKAB, Sweden	
The Svea tunnel – record performance in arctic conditions	207
F. Nilsen, Leonhard Nilsen and Sønner As, Norway	
Development rates in poor ground conditions	213
T.T. Parrott, Newmont Asia Pacific, Australia; S. Price and P.C. Keall, Newmont Waihi Gold Mine, New Zealand	

Section 4: Development Blasting

DynoMiner™ Delivery Systems and TITAN® 7000 emulsion series – the safe and productive solution to development charging	223
S. Parsons, Dyno Nobel Asia Pacific, Australia	
Assessment of tunnel perimeters produced by blasting	231
A.T. Spathis, G. Yuill and D. Stow, Orica Mining Services Technical Centre, Australia	
Author Index	239