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Mechanical Excavation in Mining and Civil Industries

Nuh Bilgin | Hanifi Copur | Cemal Balci



Mechanical Excavation In Mining And Civil Industries



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Mechanical Excavation In Mining And Civil Industries:

Mechanical Excavation in Mining and Civil Industries Nuh Bilgin, Hanifi Copur, Cemal Balci, 2013-12-05 The secret to streamlined scheduling of mining and civil engineering projects is a solid understanding of the basic concepts of rock cutting mechanics Comparing theoretical values with experimental and real world results Mechanical Excavation in Mining and Civil Industries thoroughly explains various rock cutting theories developed for chisel conical disc and button cutters The authors provide numerical examples on the effect of independent variables on dependent variables as well as numerical and solved examples from real life mining and civil engineering projects using equipment such as Hard and soft ground tunnel boring machines TBMs Roadheaders Shearers Ploughs Chain saws Raise borers Impact hammers Large diameter drill rigs Microtunnel boring machines This book assists students and practicing engineers in selecting the most appropriate machinery for a specific job and predicting machine performance to ensure efficient extraction and offers background information on rock cutting mechanics and different mechanical miners , **Tunnels and Underground Cities.**

Engineering and Innovation Meet Archaeology, Architecture and Art Daniele Peila, Giulia Viggiani, Tarcisio Celestino, 2019-04-17 Tunnels and Underground Cities Engineering and Innovation meet Archaeology Architecture and Art contains the contributions presented at the World Tunnel Congress 2019 Naples Italy 3 9 May 2019 The use of underground space is continuing to grow due to global urbanization public demand for efficient transportation and energy saving production and distribution The growing need for space at ground level along with its continuous value increase and the challenges of energy saving and achieving sustainable development objectives demand greater and better use of the underground space to ensure that it supports sustainable resilient and more liveable cities This vision was the source of inspiration for the design of the logos of both the International ITA and Italian SIG Tunnelling Association By placing key infrastructures underground the black circle in the logos it will be possible to preserve and enhance the quality of the space at ground level the green line In order to consider and value underground space usage together with human and social needs engineers architects and artists will have to learn to collaborate and develop an interdisciplinary design approach that addresses functionality safety aesthetics and quality of life and adaptability to future and varied functions The 700 contributions cover a wide range of topics from more traditional subjects connected to technical challenges of design and construction of underground works with emphasis on innovation in tunneling engineering to less conventional and archetypically Italian themes such as archaeology architecture and art The book has the following main themes Archaeology Architecture and Art in underground construction Environment sustainability in underground construction Geological and geotechnical knowledge and requirements for project implementation Ground improvement in underground constructions Innovation in underground engineering materials and equipment Long and deep tunnels Public communication and awareness Risk management contracts and financial aspects Safety in underground construction Strategic use of

underground space for resilient cities Urban tunnels Tunnels and Underground Cities Engineering and Innovation meet Archaeology Architecture and Art is a valuable reference text for tunneling specialists owners engineers architects and others involved in underground planning design and building around the world and for academics who are interested in underground constructions and geotechnics

Strength, Cuttability, and Workability of Coal Nuh Bilgin,Hanifi Copur,Cemal Balci,Deniz Tumac,2018-12-18 World coal production will increase up to 2040 and world energy consumption will be very much dependent on coal For a better planning of coal mining operations it is essential to know the strength cuttability and workability of coal which are interrelated The main objective of the book is to combine the research studies and compile the book oriented to the coal industry research students practicing engineers and coal mine panning teams Key Features Covers all the subjects related to coal properties mining and excavation in one book Presents a summary of physical and mechanical properties of coal belonging to a wide range of countries Includes typical examples of using physical and mechanical of coal in mine planning and in its industrial applications Explains use of cuttability characteristics of coal Describes planning of coal production using ploughs shearers and surface miners

Critical Issues in Selecting Conventional and Mechanized Tunnelling Methods Nuh Bilgin,Cemal Balci,2025-05-03 This book discusses the critical issues in selecting conventional and mechanized tunneling methods and lessons learned from the past It covers the following main topics geological and geotechnical parameters affecting tunneling methods summarizing conventional tunneling and mechanized tunneling methods the factors affecting the choice of tunneling methods such as the cost of the initial investment the length of the tunnel project scheduling time for mobilization emerging new technologies Some examples of changing the tunneling method from conventional to mechanized tunneling or vice versa during the same ongoing project and hybrid tunneling methods in the same project are also given The last chapter resumes the innovations made for the tunneling industry summarizing advancements in safety non circular TBMs robotics new instrumentation new materials and methodologies to decrease carbon footprint This book is aimed at graduate students professionals and researchers in tunneling civil and mining engineering and geology

Expanding Underground - Knowledge and Passion to Make a Positive Impact on the World Georgios Anagnostou,Andreas Benardos,Vassilis P. Marinos,2023-04-12 Expanding Underground Knowledge and Passion to Make a Positive Impact on the World contains the contributions presented at the ITA AITES World Tunnel Congress 2023 Athens Greece 12 18 May 2023 Tunnels and underground space are a predominant engineering practice that can provide sustainable cost efficient and environmentally friendly solutions to the ever growing needs of modern societies This underground expansion in more diverse and challenging infrastructure types or to novel underground uses can foster the changes needed At the same time the tunneling and underground space community needs to be better prepared and equipped with knowledge tools and experience to deal with the prevailing conditions to successfully challenge and overcome adversities on this path The papers in this book aim at contributing to the analysis of challenging conditions

the presentation and dissemination good practices the introduction of new concepts new tools and innovative elements that can help engineers and all stakeholders to reach their end goals Expanding Underground Knowledge and Passion to Make a Positive Impact on the World covers a wide range of aspects and topics related to the whole chain of the construction and operation of underground structures Knowledge and Passion to Expand Underground for Sustainability and Resilience Geological Geotechnical Site Investigation and Ground Characterization Planning and Designing of Tunnels and Underground Structures Mechanised Tunnelling and Microtunnelling Conventional Tunnelling Drill and Blast Applications Tunnelling in Challenging Conditions Case Histories and Lessons Learned Innovation Robotics and Automation BIM Big Data and Machine Learning Applications in Tunnelling Safety Risk and Operation of Underground Infrastructure and Contractual Practices Insurance and Project Management The book is a must have reference for all professionals and stakeholders involved in tunneling and underground space development projects *Tunnelling for a Better Life* Jinxiu Yan,Tarcisio Celestino,Markus Thewes,Erik Eberhardt,2024-05-29 Tunnelling for a Better Life contain the contributions presented at the ITA AITES World Tunnel Congress 2024 which was held from 19 25 April 2024 in Shenzhen China As urbanization accelerates the pivotal role of tunnels and underground spaces in fostering environmental sustainability and improving quality of life becomes ever more pronounced These underground structures serve as sustainable solutions to the challenges posed by rapid urban growth By seamlessly integrating into urban landscapes they alleviate congestion reduce pollution and enhance overall mobility thus contributing to a greener and more sustainable urban environment Moreover tunnels and underground works provide vital support for various urban functions such as accommodating economic activities providing safe shelters during emergencies or disasters and facilitating efficient utility management They address immediate urban needs and lay the foundation for a better and more resilient future By focusing on the latest trends in tunnelling and underground engineering and looking ahead to the era of low carbon and intelligent technology the papers in this book illustrate the transformative potential of tunnels and underground works in shaping a better life for present and future generations The contributions cover a comprehensive range of topics on tunnel engineering showcasing the latest advancements insights and innovations across the following areas 1 Planning and General Aspects 2 Design and Methodology 3 Geotechnics Geology and Geophysical Prospecting 4 Ground Stability and Consolidation 5 Support and Lining 6 Conventional Tunnelling 7 Mechanized Tunneling TBM shield 8 Immersed Tunnels 9 Waterproofing and Drainage 10 Instrumentation and Monitoring Testing and Inspection 11 Digital and Information Technology 12 Machine Learning 13 Underground Caverns Underground Space Use 14 Operational Safety Maintenance and Repair 15 Contractual Practices and Risk Management Tunnelling for a Better Life is a must read for professionals engineers owners and other stakeholders worldwide in tunnelling and underground engineering **Geomechanics and Geodynamics of Rock Masses** Vladimir Litvinenko,2018-05-15 Geomechanics and Geodynamics of Rock Masses contains contributions presented at EUROCK 2018

the 2018 International Symposium of the International Society for Rock Mechanics ISRM 2018 Saint Petersburg Russia 22-26 May 2018 Dedicated to recent advances and achievements in the fields of geomechanics and geotechnology the main topics of the book include Physical and mechanical properties of fractured rock laboratory testing and rock properties field measurements and site investigations Geophysics in rock mechanics Rock mass strength and failure Nonlinear problems in rock mechanics Effect of joint water on the behavior of rock foundation Numerical modeling and back analysis Mineral resources development methods and rock mechanics problems Rock mechanics and underground construction in mining hydropower industry and civil engineering Rock mechanics in petroleum engineering Geodynamics and monitoring of rock mass behavior Risks and hazards Geomechanics of technogenic deposits Geomechanics and Geodynamics of Rock Masses will be of interest to researchers and professionals involved in the various branches of rock mechanics and rock engineering EUROCK 2018 organized by the Saint Petersburg Mining University is a continuation of the successful series of ISRM symposia in Europe which began in 1992 in Chester UK

Rock Mechanics for Natural Resources and Infrastructure Development - Full Papers Sergio A.B. Fontoura, Ricardo Rocca, José Mendoza, 2019-09-03 Rock Mechanics for Natural Resources and Infrastructure Development contains the proceedings of the 14th ISRM International Congress ISRM 2019 Foz do Iguaçu Brazil 13-19 September 2019 Starting in 1966 in Lisbon Portugal the International Society for Rock Mechanics and Rock Engineering ISRM holds its Congress every four years At this 14th occasion the Congress brings together researchers professors engineers and students around contemporary themes relevant to rock mechanics and rock engineering Rock Mechanics for Natural Resources and Infrastructure Development contains 7 Keynote Lectures and 449 papers in ten chapters covering topics ranging from fundamental research in rock mechanics laboratory and experimental field studies and petroleum mining and civil engineering applications Also included are the prestigious ISRM Award Lectures the Leopold Muller Award Lecture by professor Peter K Kaiser and the Manuel Rocha Award Lecture by Dr Quinghua Lei Rock Mechanics for Natural Resources and Infrastructure Development is a must read for academics engineers and students involved in rock mechanics and engineering Proceedings in Earth and geosciences Volume 6 The Proceedings in Earth and geosciences series contains proceedings of peer reviewed international conferences dealing in earth and geosciences The main topics covered by the series include geotechnical engineering underground construction mining rock mechanics soil mechanics and hydrogeology

Practical Management of Tunneling with Tunnel Boring Machines Nuh Bilgin, Sinan Acun, 2024-02-12 This book covers the management of mechanized tunneling with examples from global projects It starts with an introduction to mechanized tunneling including management of job organization planning job sites portals or launching boxes in mountains open fields and urban areas The management of the transport with belt conveyors locomotives and multi service vehicles is explained with numerical examples Cost management and basic parameters governing tunneling costs in different countries are discussed Risk management in mechanized tunneling projects is also explained Features

Offers the practical issues with setting up a job site the cost and logistic issues related to tunneling Reviews cost management and basic parameters governing tunneling costs in different countries Covers treatment of spoil management plan and the management of contaminated ground Explores key points on the logistics and the management of the consumables Provides the latest international case studies of specific companies This book is aimed at professionals and researchers in tunneling civil and mining engineering and geology

Rock Mechanics and Rock Engineering: From the Past to the Future Reşat Ulusay, 2016-11-18 Rock Mechanics and Rock Engineering From the Past to the Future contains the contributions presented at EUROCK2016 the 2016 International Symposium of the International Society for Rock Mechanics ISRM 2016 rg p Cappadocia Region Turkey 29 31 August 2016 The contributions cover almost all aspects of rock mechanics and rock engineering from theories to engineering practices emphasizing the future direction of rock engineering technologies The 204 accepted papers and eight keynote papers are grouped into several main sections Fundamental rock mechanics Rock properties and experimental rock mechanics Analytical and numerical methods in rock engineering Stability of slopes in civil and mining engineering Design methodologies and analysis Rock dynamics rock mechanics and rock engineering at historical sites and monuments Underground excavations in civil and mining engineering Coupled processes in rock mass for underground storage and waste disposal Rock mass characterization Petroleum geomechanics Carbon dioxide sequestration Instrumentation monitoring in rock engineering and back analysis Risk management and the 2016 Rocha Medal Lecture and the 2016 Franklin Lecture Rock Mechanics and Rock Engineering From the Past to the Future will be of interest to researchers and professionals involved in the various branches of rock mechanics and rock engineering EUROCK 2016 organized by the Turkish National Society for Rock Mechanics is a continuation of the successful series of ISRM symposia in Europe which began in 1992 in Chester UK

2019 Rock Dynamics Summit Ömer Aydan, Takashi Ito, Takafumi Seiki, Katsumi Kamemura, Naoki Iwata, 2019-07-04 Rock dynamics has become one of the most important topics in the field of rock mechanics and rock engineering and involves a wide variety of topics from earthquake engineering blasting impacts failure of rock engineering structures as well as the occurrence and prediction of earthquakes induced seismicity rock bursts to non destructive testing and explorations Rock dynamics has wide applications in civil and infrastructural resources and energy geological and environmental engineering geothermal energy and earthquake hazard management and has become one of the most topical areas 2019 Rock Dynamics Summit contains 8 keynote addresses and 128 regular full papers that were presented at the 2019 Rock Dynamics Summit 2019 RDS Okinawa Japan 7 11 May 2019 a specialized conference jointly organized by the Rock Dynamics Committee of the Japanese Society of Civil Engineers JSCE RDC the Japanese Society for Rock Mechanics JSRM and which was supported by the International Society for Rock Mechanics and Rock Engineering ISRM and the Turkish National Society for Rock Mechanics TNSRM The contributions cover a wide range of topics on the dynamic behavior of rock and rock masses and scientific and engineering applications

and include Laboratory tests on Dynamic Responses of Rocks and Rock Masses Fracturing of Rocks and Associated Strong Motions Estimation Procedures and Numerical Techniques of Strong Motions Associated with the Rupture of Earth's Crust and Some Strong Motion Dynamic Response and Stability of Rock Foundations Underground Excavations in Rock Rock Slopes Dynamic Responses and Stability of Stone Masonry Historical Structures and Monuments Induced Seismicity Dynamic Simulation of Loading and Excavation Blasting and machinery induced vibrations Rockburst Outburst Impacts Nondestructive Testing Using Shock Waves Case Histories of Failure Phenomenon in Rock Engineering 2019 Rock Dynamics Summit contains the state of the art in rock dynamics and will be invaluable to professionals and academics interested in the latest advances in new techniques for experiments analytical and numerical modelling as well as monitoring in dynamics of rocks and rock engineering structures

Innovation-Based Development of the Mineral Resources Sector:

Challenges and Prospects Vladimir Litvinenko, 2018-10-11 Innovation Based Development of the Mineral Resources Sector Challenges and Prospects contains the contributions presented at the XI Russian German Raw Materials Conference Potsdam Germany 7-8 November 2018 The Russian German Raw Materials Conference is held within the framework of the Permanent Russian German Forum on the Issues of the Use of Raw Materials which has as goals to develop new approaches to effectively use energy mineral and renewable natural resources and to initiate cooperation in the field of sustainability and environmental protection The contributions cover current trends in the development of raw materials markets and the world economy the state of the environment and new technologies applied in the sector effectively responding to modern challenges The 63 accepted papers are grouped into four main sections Mineral exploration and mining Mining services Processing of raw materials Other Innovation Based Development of the Mineral Resources Sector Challenges and Prospects will be of interest to academics and researchers involved in the mineral resources sector but also to professionals in the public foreign trade and education fields and representatives of major corporations and professional associations

Tunnelling into a Sustainable Future – Methods and Technologies Fredrik Johansson, Anders Ansell, Daniel Johansson, Johan Funehag, Jenny Norrman, 2025-05-12 Tunnelling into a Sustainable Future Methods and Technologies contains the contributions presented at the ITA AITES World Tunnel Congress 2025 Stockholm Sweden 9-15 May 2025 The contributions cover a wide range of topics in the fields of tunnelling and underground engineering including 1 Innovating tunneling 2 Safety Underground 3 Use of underground space 4 Investigations and ground characterisation 5 Planning and design of underground space 6 Conventional tunnelling 7 Mechanised tunnelling 8 Complex geometries including shafts and ramps 9 Grouting and groundwater control 10 Instrumentation and monitoring 11 Operation inspection and maintenance 12 Contractual aspects financing and risk management 13 Impact from climate change Tunnelling into a Sustainable Future Methods and Technologies will serve as a valuable reference to all concerned with tunnelling and underground engineering including students researchers and engineers

Mine Planning and Equipment Selection 2000 T.N.

Michalakopoulos,2018-05-08 This text looks at mine planning and equipment and covers topics such as design and planning of surface and underground mines geotechnical stability in surface and underground mines and mining and the environment

TBM Excavation in Difficult Ground Conditions Nuh Bilgin,Hanifi Copur,Cemal Balci,2016-11-15 The book relates experience of TBM drives in difficult geology making use of case studies from Turkey to demonstrate the influence of the local geotechnical conditions on the selection of a tunnel boring machine and the selection of tools There is an extensive description how various geological phenomena such as for example transition zones dikes rock discontinuities blocky ground squeezing ground swelling clays and high strength and abrasive rocks can reduce the advance rate and what countermeasures can be introduced There is also a discussion of necessary advance probing and safety measures Since the presented practical experience from Turkey can also be applicable for other tunnel projects in difficult geology the book represents a valuable source of knowledge for every tunneler

Rock Dynamics: Progress and Prospect, Volume 2

Jianchun Li,Xiaozhao Li,Minghe Ju,Fengqiang Gong,Yingxin Zhou,2023-05-28 Rock Dynamics Progress and Prospect contains 153 scientific and technical papers presented at the Fourth International Conference on Rock Dynamics and Applications RocDyn 4 Xuzhou China 17 19 August 2022 The two volume set has 7 sections Volume 1 includes the first four sections with 6 keynotes and 5 young scholar plenary session papers and contributions on analysis and theoretical development and experimental testing and techniques Volume 2 contains the remaining three sections with 74 papers on numerical modelling and methods seismic and earthquake engineering and rock excavation and engineering Rock Dynamics Progress and Prospect will serve as a reference on developments in rock dynamics scientific research and on rock dynamics engineering applications The previous volumes in this series RocDyn 1 RocDyn 2 and RocDyn 3 are also available via CRC Press

Geomechanics and Geodynamics of Rock Masses - Volume 2 Vladimir Litvinenko,2018-05-20 This book is Volume 2 of the EUROCK 2018 proceedings Geomechanics and Geodynamics of Rock Masses contains contributions presented at EUROCK 2018 the 2018 International Symposium of the International Society for Rock Mechanics ISRM 2018 Saint Petersburg Russia 22 26 May 2018 Dedicated to recent advances and achievements in the fields of geomechanics and geotechnology the main topics of the book include Physical and mechanical properties of fractured rock laboratory testing and rock properties field measurements and site investigations Geophysics in rock mechanics Rock mass strength and failure Nonlinear problems in rock mechanics Effect of joint water on the behavior of rock foundation Numerical modeling and back analysis Mineral resources development methods and rock mechanics problems Rock mechanics and underground construction in mining hydropower industry and civil engineering Rock mechanics in petroleum engineering Geodynamics and monitoring of rock mass behavior Risks and hazards Geomechanics of technogenic deposits Geomechanics and Geodynamics of Rock Masses will be of interest to researchers and professionals involved in the various branches of rock mechanics and rock engineering EUROCK 2018 organized by the Saint Petersburg Mining University is a continuation of the

successful series of ISRM symposia in Europe which began in 1992 in Chester UK *Handbook on Tunnels and Underground Works* Emilio Bilotta, Renato Casale, Claudio Giulio di Prisco, Salvatore Miliziano, Daniele Peila, Andrea Pigorini, Enrico Maria Pizzarotti, 2022-09-19 This book set provides a new global updated thorough clear and practical risk based approach to tunnelling design and construction methods and discusses detailed examples of solutions applied to relevant case histories It is organized in three sequential and integrated volumes Volume 1 Concept Basic Principles of Design Volume 2 Construction Methods Equipment Tools and Materials Volume 3 Case Histories and Best Practices The book covers all aspects of tunnelling giving useful and practical information about design Vol 1 construction Vol 2 and best practices Vol 3 It provides the following features and benefits updated vision on tunnelling design tools materials and construction balanced mix of theory technology and applied experience different and harmonized points of view from academics professionals and contractors easy consultation in the form of a handbook risk oriented approach to tunnelling problems The tunnelling industry is amazingly widespread and increasingly important all over the world particularly in developing countries The possible audience of the book are engineers geologists designers constructors providers contractors public and private customers and in general technicians involved in the tunnelling and underground works industry It is also a suitable source of information for industry professionals senior undergraduate and graduate students researchers and academics Scientific and Practical Studies of Raw Material Issues Vladimir Litvinenko, 2019-11-07 Scientific and practical studies of raw material issues presents the contribution to the Russian German raw materials forum The main theme of the book is problematic issues of subsoil use whereby the contributions are divided in two main parts Exploration mining and processing and Mining services Paying much attention to complex processes in the mining industry Scientific and practical studies of raw material issues will be of interest to academics and professional involved or interested in Mining Engineering and Earth Sciences

Mechanical Excavation In Mining And Civil Industries Book Review: Unveiling the Magic of Language

In a digital era where connections and knowledge reign supreme, the enchanting power of language has are more apparent than ever. Its capability to stir emotions, provoke thought, and instigate transformation is really remarkable. This extraordinary book, aptly titled "**Mechanical Excavation In Mining And Civil Industries**," published by a highly acclaimed author, immerses readers in a captivating exploration of the significance of language and its profound affect our existence. Throughout this critique, we will delve into the book is central themes, evaluate its unique writing style, and assess its overall influence on its readership.

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