



# SLOPE **STABILITY**

*in Surface Mining*

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# Slope Stability In Surface Mining

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## **Slope Stability In Surface Mining:**

*Geotechnical Stability in Surface Mining* Raj. K. Singhal, 2022-05-14 This book presents the proceedings of the international symposium on geotechnical stability in surface mining in Calgary The symposium deals with the full gamut of mine equipment development selection and utilization *Geotechnical Stability in Surface Mining* Singhal, 1986-01-01

**2001 SME Annual Meeting** Society for Mining, Metallurgy, and Exploration (U.S.). Meeting, 2001 *Surface Mining, Second Edition* Bruce A. Kennedy, Society for Mining, Metallurgy, and Exploration (U.S.), 1990 This SME classic is both a reference book for the working engineer and a textbook for the mining student This hardcover edition gives a brief history of surface mining and a general overview of the state of surface mining today topics range from production and productivity to technological developments and trends in equipment This extremely useful text takes the approach that exploration and mining geologists must be expert in a number of fields including basic finance and economics logistics and pragmatic prospecting Readers will find material on all these topics and more The book's nine chapters include Introduction Exploration and Geology Techniques Ore Reserve Estimation Feasibility Studies and Project Financing Planning and Design of Surface Mines Mine Operations Mine Capital and Operating Costs Management and Organization and Case Studies The book is fully indexed **Analysis of Landslides and Slope Stability in Coal Surface Mining** James Daniel Cowan, 1977

**Guidelines for Open Pit Slope Design** John Read, Peter Stacey, 2009-11-09 *Guidelines for Open Pit Slope Design* is a comprehensive account of the open pit slope design process Created as an outcome of the Large Open Pit LOP project an international research and technology transfer project on rock slope stability in open pit mines this book provides an up to date compendium of knowledge of the slope design processes that should be followed and the tools that are available to aid slope design practitioners This book links innovative mining geomechanics research into the strength of closely jointed rock masses with the most recent advances in numerical modelling creating more effective ways for predicting rock slope stability and reliability in open pit mines It sets out the key elements of slope design the required levels of effort and the acceptance criteria that are needed to satisfy best practice with respect to pit slope investigation design implementation and performance monitoring *Guidelines for Open Pit Slope Design* comprises 14 chapters that directly follow the life of mine sequence from project commencement through to closure It includes information on gathering all of the field data that is required to create a 3D model of the geotechnical conditions at a mine site how data is collated and used to design the walls of the open pit how the design is implemented up to date procedures for wall control and performance assessment including limits blasting scaling slope support and slope monitoring and how formal risk management procedures can be applied to each stage of the process This book will assist in meeting stakeholder requirements for pit slopes that are stable in regards to safety ore recovery and financial return for the required life of the mine [SME Mining Engineering Handbook, Third Edition](#) Peter Darling, Society for Mining, Metallurgy, and Exploration (U.S.), 2011 This third edition of the SME Mining

Engineering Handbook reaffirms its international reputation as the handbook of choice for today's practicing mining engineer. It distills the body of knowledge that characterizes mining engineering as a disciplinary field and has subsequently helped to inspire and inform generations of mining professionals. Virtually all of the information is original content representing the latest information from more than 250 internationally recognized mining industry experts. Within the handbook's 115 thought-provoking chapters are current topics relevant to today's mining professional: Analyzing how the mining and minerals industry will develop over the medium and long term; why such changes are inevitable; what this will mean in terms of challenges and how they could be managed; Explaining the mechanics associated with the multifaceted world of mine and mineral economics; from the decisions associated with how best to finance a single piece of high-value equipment to the long-term cash flow issues associated with mine planning at a mature operation; Describing the recent and ongoing technical initiatives and engineering developments in relation to robotics, automation, acid rock drainage, block caving optimization or process dewatering methods; Examining in detail the methods and equipment available to achieve efficient, predictable and safe rock breaking; whether employing a tunnel boring machine for development work, mineral extraction using a mobile miner or cast blasting at a surface coal operation; Identifying the salient points that dictate which is the safest, most efficient and most versatile extraction method to employ as well as describing in detail how each alternative is engineered; Discussing the impacts that social and environmental issues have on mining from the pre-exploration phase to end-of-mine issues and beyond and how to manage these two increasingly important factors to the benefit of both the mining companies and other stakeholders.

**Guidelines for Slope Performance Monitoring** Robert Sharon, Erik Eberhardt, 2020-07-01 Although most mining companies utilise systems for slope monitoring, experience indicates that mining operations continue to be surprised by the occurrence of adverse geotechnical events. A comprehensive and robust performance monitoring system is an essential component of slope management in an open pit mining operation. The development of such a system requires considerable expertise to ensure the monitoring system is effective and reliable. Written by instrumentation experts and geotechnical practitioners, *Guidelines for Slope Performance Monitoring* is an initiative of the Large Open Pit LOP Project and the fifth book in the *Guidelines for Open Pit Slope Design* series. Its 10 chapters present the process of establishing and operating a slope monitoring system, the fundamentals of pit slope monitoring instrumentation and methods, monitoring system operation, data acquisition, management and analysis, and utilising and communicating monitoring results. The implications of increased automation of mining operations are also discussed, including the future requirements of performance monitoring. *Guidelines for Slope Performance Monitoring* summarises leading mine industry practice in monitoring system design, implementation, system management, data management and reporting, and provides guidance for engineers, geologists, technicians and others responsible for geotechnical risk management.

**Rock Slope Stability** Charles A. Kliche, 1999 Whether you're involved in surface mine

design or production construction education or regulation this is an important new book for your library It describes the basic rock slope failure modes and methods of analysis both kinematic and kinetic techniques Chapters include geotechnical and geomechanical analysis techniques hydrology rock slope stabilization techniques and geotechnical instrumentation and monitoring Numerous examples drawings and photos enhance the text The book is organized in a logical sequence to help the reader identify the potential failure modes s conduct appropriate tests for important geotechnical and geological parameters analyze the stability of the rock slope and design an appropriate monitoring system Rock slope stability and the design of the appropriate slope angle is extremely important for surface mining in these difficult economic times The design of too flat of a highwall angle means considerable additional mining costs the design of too steep of a highwall angle poses additional safety hazards Rock slope stability is also an important consideration in the design of transportation corridors such as roads highways and rail lines The design engineer and the regulator must be familiar with the concepts to choose the best design at the lowest cost

Stability Analysis of Earth Slopes Y.H. Huang, 2012-12-06 During the past several years I have been engaged in applied research related to the stability analysis of slopes This research was supported by the Institute for Mining and Minerals Research University of Kentucky in response to the Surface Mining Control and Reclamation Act of 1977 which requires stability analysis for refuse dams hollow fills and spoil banks created by surface mining The results of the research have been published in several journals and reports and also presented in a number of short courses Both the simplified and the computerized methods of stability analysis as developed from this research have been widely used by practicing engineers throughout Kentucky for the application of mining permits The large number of out of state participants in the short courses indicates that the methods developed have widespread applications This book is a practical treatise on the stability analysis of earth slopes Special emphasis is placed on the utility and application of stability formulas charts and computer programs developed recently by the author for the analysis of human created slopes These analyses can be used for the design of new slopes and the assessment of remedial measures on existing slopes To make the book more complete as a treatise on slope stability analysis other methods of stability analysis in addition to those developed by the author are briefly discussed It is hoped that this book will be a useful reference class room text and users manual for people interested in learning about stability analysis

Geotechnical Instrumentation and Monitoring in Open Pit and Underground Mining T. Szwedzicki, 2020-07-15 As mining operations increase in scale and mines go progressively deeper the geotechnical input into mine design is of importance This book covers topics in geotechnical instrumentation and monitoring including coverage of groundwater displacement and environmental monitoring

**Guidelines for Evaluating Water in Pit Slope Stability** John Read, Geoff Beale, 2013-12-17 Guidelines for Evaluating Water in Pit Slope Stability is a comprehensive account of the hydrogeological procedures that should be followed when performing open pit slope stability design studies Created as an outcome of the Large Open Pit LOP project an international research and technology transfer project on the stability of rock

slopes in open pit mines this book expands on the hydrogeological model chapter in the LOP project's previous book **Guidelines for Open Pit Slope Design** Read CSIRO PUBLISHING The book comprises six sections which outline the latest technology and best practice procedures for hydrogeological investigations The sections cover the framework used to assess the effect of water in slope stability how water pressures are measured and tested in the field how a conceptual hydrogeological model is prepared how water pressures are modelled numerically how slope depressurisation systems are implemented and how the performance of a slope depressurisation program is monitored and reconciled with the design **Guidelines for Evaluating Water in Pit Slope Stability** offers slope design practitioners a road map that will help them decide how to investigate and treat water pressures in pit slopes It provides guidance and essential information for mining and civil engineers geotechnical engineers engineering geologists and hydrogeologists involved in the investigation design and construction of stable rock slopes

**Sensing and Monitoring Technologies for Mines and Hazardous Areas** Swadesh Chaulya, G. M. Prasad, 2016-06-10 **Sensing and Monitoring Technologies for Mines and Hazardous Areas** Monitoring and Prediction Technologies presents the fundamentals of mining related geotechnical risk and how the latest advances in sensing and data communication can be used both to prevent accidents and provide early warnings Opencast mining operations involve huge quantities of overburden removal dumping and backfilling in excavated areas Substantial increases in the rate of accumulation of waste dumps in recent years has resulted in greater height of dumps and also has given rise to the danger of dump failures as steeper open pit slopes are prone to failure These failures lead to loss of valuable human lives and damage to mining machinery This book presents the most recent advances in gas sensors methane detectors and power cut off systems It also introduces monitoring of the gas strata and environment and an overview of the use of Internet of Things and cloud computing for mining sensing and surveillance purposes Targeted at geotechnical and mining engineers this volume covers the latest findings and technology to prevent mining accidents and mitigate the inherent risk of the activity Presents complete details of a real time slope stability monitoring system using wireless sensor networking and prediction technique based on multivariate statistical analysis of various parameters and analytical hierarchy process methods Discusses innovative ideas and new concepts of sensing technologies mine transport surveillance digital mining and cloud computing to improve safety and productivity in mining industry Includes slope stability prediction software downloadable through a companion website which can be used for monitoring analyzing and storing different sensors and providing audio visual SMS and email alerts Covers the latest findings and technology to prevent mining accidents and mitigate the inherent risk

**Rock Slope Engineering** Duncan C. Wyllie, Chris Mah, 2017-12-21 The stability of rock slopes is an important issue in both civil and mining engineering On civil projects rock cuts must be safe from rock falls and large scale slope instability during both construction and operation In open pit mining where slope heights can be many hundreds of meters the economics of the operation are closely related to the steepest stable slope angle that can be mined This

extensively updated version of the classic text *Rock Slope Engineering* by Hoek and Bray deals comprehensively with the investigation design and operation of rock slopes Investigation methods include the collection and interpretation of geological and groundwater data and determination of rock strength properties including the Hoek Brown rock mass strength criterion Slope design methods include the theoretical basis for the design of plane wedge circular and toppling failures and design charts are provided to enable rapid checks of stability to be carried out New material contained in this book includes the latest developments in earthquake engineering related to slope stability probabilistic analysis numerical analysis blasting slope movement monitoring and stabilization methods The types of stabilization include rock anchors shotcrete drainage and scaling as well as rock fall protecting methods involving barriers ditches nets and sheds *Rock Slopes* Civil and Mining Engineering contains both worked examples illustrating data interpretation and design methods and chapters on civil and mining case studies The case studies demonstrate the application of design methods to the construction of stable slopes in a wide variety of geological conditions The book provides over 300 carefully selected references for those who wish to study the subject in greater detail It also includes an introduction by Dr Evert Hoek

*Mine Planning and Equipment Selection 1998* Raj K. Singhal, 1998-01-01 This work details the findings of the 7th International Conference on Mine Planning and Equipment Selection of 1998 held in Calgary Topics include design and planning of surface and underground mines geotechnical stability in surface and underground mines and mining and the environment *Stability in Open Pit Mining* Engineering Institute of Canada. B.C. Section, Canadian Institute of Mining and Metallurgy. B.C. Section, 1971 *Fossil Energy Update*, 1981

**Guidelines for Open Pit and Waste Dump Closure** Phil de Graaf, Geoff Beale, Trevor Carter, 2025-05-01 *Guidelines for Open Pit and Waste Dump Closure* provides a benchmark reference for geotechnical and hydrogeological professionals and other closure stakeholders involved in assessing and implementing the closure of open pits and waste dumps It defines a state of best practice geotechnical and hydrological pathway that reflects current industry wide experience considers the perspectives of the operator regulator and community and encompasses closure planning design implementation and monitoring Written by industry experts and practitioners *Guidelines for Open Pit and Waste Dump Closure* is the sixth in a series of books developed by the Large Open Pit LOP Project Focused on the technical challenges related to geology geotechnical engineering water and geochemistry it covers the key aspects that relate to closure of open pits and waste dumps including planning long term physical and chemical stability and post mining land use PMLU The book also includes workflows that provide clarity on geotechnical and hydrogeological assessments relating to closure planning definition of pragmatic objectives and measures of success implementation and monitoring for open pits and waste dumps for closure and how these may interact with adjacent land uses Drawing on global lessons learned on mine closure over a period of more than 30 years this comprehensive guide uses industry experience to set out a road map to closure and potentially relinquishment of open pits and waste dumps It will be invaluable for mine closure

practitioners corporate planners mine management mining engineers and technical staff mine stakeholders and regulators

**Surface Mining Technology** Mostafa Mohamed Ali Elbeblawi, Hassan Ali Abdelhak Elsaghier, Mostafa Tantawy Mohamed Amin, Wael Rashad Elrawy Abdellah, 2021-07-31 This book gives a brief history and a general overview of the state of surface mining technology with topics ranging from the principles to surface mining methods systems and pit planning design It starts with the definition of surface mine and ends with land reclamation and mine closure The following chapters address the basics of mineral economics calculation of stripping ratio exploitation of difficult parts of ore deposits slope stability controlling falls and slides in the surface mines sorts of freight traffic scrapers bulldozers and loaders The book serves as a reference text for mining students engineers and geologists      *Engineered Rock Structures in Mining and Civil Construction* Raghu N. Singh, Ajoy K. Ghose, 2006-01-26 The book collates and sifts a vast amount of literature on the design of structures in the mining and construction industries to synthesize a comprehensive text on the subject area The focus is on the application of theory to practice and the book is richly illustrated with worked out examples The presentation is lucid and based on the extensive professional teaching and research experience of the authors The text seeks to address the key issues of design of engineered structures in or on rock The book will serve as a standard text for undergraduate courses in mining civil engineering and engineering geology



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