

Calculation Of Drilling And Blasting Parameters For Quarry

Volume 2 of the Handbook covers the geotechnical procedures used in manufacturing anchors and piles as well as for improving or underpinning foundations, securing existing constructions, controlling ground water, excavating rocks and earth works. It also treats such specialist areas as the use of geotextiles and seeding.

This fourth volume of five from the June 1997 conference was much delayed (the first four volumes were published in 1997). It comprises 23 special lectures solicited for the conference on various aspects of problematic soils, natural and man-made hazards, urban and regional planning, waste disposal, mines and quarries, large engineering works, and protection of geological, geographical, historical, and architectural heritage. There is no subject index. Annotation copyrighted by Book News Inc., Portland, OR

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.

A Comparison of Calculated Patterns with Plans Used in Quarrying Limestone and Dolomite, with Geologic Considerations

The Effect of Fragmentation Specification on Blasting Cost

Applications of Artificial Intelligence Techniques

Rock Blasting and Overbreak Control

Leverage Advanced Analytics in Mining Industry to Make Better Business Decisions

Rock Fragmentation by Blasting contains the papers presented at the 10th International Symposium on Rock Fragmentation by Blasting (New Delhi, India, 26-29 November 2012), and represents the most advanced forum on blasting science and technology. The contributions cover all major recent advancements in blasting and fragmentation, from realistic tre

This work provides detailed information about materials needed for carrying out blasting operations such as explosives and related accessories, understanding of the process of fragmentation, various techniques, design methods, and applications including environmental aspects.

Tunnelling in Rock by Drilling and Blasting presents the latest developments in the excavation of tunnels using the drilling and blasting method. Examples of work conducted throughout the world including the Indian sub-continent, Australia, and Sweden amongst others are discussed. These tunnel projects serve to illustrate the challenges and i

Engineering Fundamentals and International Case Studies

Explosives and Blasting Technique

Theoretical and Practical Solutions of Mineral Resources Mining

Fragblast 10

Rotary Drilling and Blasting in Large Surface Mines

An introductory text and reference on mining engineering highlighting the latest in mining technology Introductory Mining Engineering outlines the role of the mining engineer throughout the life of a mine, including prospecting for the deposit, determining the site's value, developing the mine, extracting the mineral values, and reclaiming the land afterward. This Second Edition is written with a focus on sustainability-managing land to meet the economic and environmental needs of the present while enhancing its ability to also meet the needs of future generations. Coverage includes aboveground and underground methods of mining for a wide range of substances, including metals, nonmetals, and fuels. Completely up to date, this book presents the latest information on such technologies as remote sensing, GPS, geophysical surveying, and mineral deposit evaluation, as well as continuous integrated mining operations and autonomous trucks. Also included is new information on landscape restoration, regional planning, wetlands protection, subsidence mitigation, and much more. New chapters include coverage of: * Environmental responsibilities * Regulations * Health and safety issues Generously supplemented with more than 200 photographs, drawings, and tables, Introductory Mining Engineering, Second Edition is an indispensable book for mining engineering students and a comprehensive reference for professionals.

Rock breakage with explosives has existed since the seventeenth century when black powder came into use in mining. Since then it has progressed from the invention of dynamite to the use of heavy ANFO. During the past two decades, there have been numerous technical contributions which have brought a better understanding of rock fragmentation with explosives, an improvement in drilling equipment and a noticeable evolution in the development of new explosives and blasting accessories. The Geomining Technological Institute of Spain (ITCE), aware of this progress and of the importance which the breakage process has acquired in mining and civil engineering projects, has ordered the publication of Drilling and Blasting of Rocks. The purpose of this Handbook is to give basic knowledge of the drilling systems, the types of available explosives and the accessories and the parameters that intervene in blast designing, whether controllable or not; at the same time the objectives and contents contribute to improved safety in mining. The Handbook is meant for all professionals who are involved with explosives in mining operations and civil engineering projects, as well as for students of technical schools.

In large surface mining operations, drilling and blasting activities constitute more than 15% of the total costs. In order to optimize performance and minimize costs, a thorough knowledge of drill and blast operations is, therefore, extremely important. In this unique reference volume, rotary blasthole drilling and surface blasting, as applied in large surface mines, are comprehensively covered. Both new and classic concepts, techniques and methodologies are presented, supported by numerous illustrations and practical data. In 26 chapters, drilling, surface blasting, rock, rock mass, machinery, tools and accessories, compressors and air flushing, computing and practice are many other relevant subjects are treated; the first 16 chapters deal with rotary blasthole drilling, and the 10 next chapters with the concepts, theory and practice of blasting. Moreover, the 14 appendices provide vital technical and commercial data, to further support the reader to design, plan, execute, and calculate blasthole drilling operations. This volume is intended for professionals and technicians in mining, exploration, geological and mechanical engineering, who are involved with the design, planning, and execution of rotary drilling and blasting operations in surface mines.

Engineering Geology and the Environment

Advanced Analytics in Mining Engineering

Tunneling in Rock by Drilling and Blasting

Theory and Applications

Proceedings

Rock Blasting and Explosives Engineering covers the practical engineering aspects of many different kinds of rock blasting. It includes a thorough analysis of the cost of the entire process of tunneling by drilling and blasting in comparison with full-face boring. Also covered are the fundamental sciences of rock mass and material strength, the thermal decomposition, burning, shock initiation, and detonation behavior of commercial and military explosives, and systems for charging explosives into drillholes. Functional descriptions of all current detonators and initiation systems are provided. The book includes chapters on flyrock, toxic fumes, the safety of explosives, and even explosives applied in metal working as a fine art. Fundamental in its approach, the text is based on the practical industrial experience of its authors. It is supported by an abundance of tables, diagrams, and figures. This combined textbook and handbook provides students, practitioners, and researchers in mining, mechanical, building construction, geological, and petroleum engineering with a source from which to gain a thorough understanding of the constructive use of explosives.

This book, written for the benefit of engineering students and practicing engineers alike, is the culmination of the author's four decades of experience related to the subject of electrical measurements, comprising nearly 30 years of experimental research and more than 15 years of teaching at several engineering institutions. The unique feature of this book, apart from covering the syllabi of various universities, is the style of presentation of all important aspects and features of electrical measurements, with neatly and clearly drawn figures, diagrams and colour and b/w photos that illustrate details of instruments among other things, making the text easy to follow and comprehend. Enhancing the chapters are interspersed explanatory comments and, where necessary, footnotes to help better understanding of the chapter contents. Also, each chapter begins with a "recall" to link the subject matter with the related science or phenomenon and fundamental background. The first few chapters of the book comprise "Units, Dimensions and Standards"; "Electricity, Magnetism and Electromagnetism" and "Network Analysis". These topics form the basics of electrical measurements and provide a better understanding of the main topics discussed in later chapters. The last two chapters represent valuable assets of the book, and relate to (a) "Magnetic Measurements", describing many unique features not easily available elsewhere, a good study of which is essential for the design and development of most electric equipment - from motors to transformers and alternators, and (b) "Measurement of Non-electrical Quantities", dealing extensively with the measuring techniques of a number of variables that constitute an important requirement of engineering measurement practices. The book is supplemented by ten appendices covering various aspects dealing with the art and science of electrical measurement and of relevance to some of the topics in main chapters. Other useful features of the book include an elaborate chapter-by-chapter list of symbols, worked examples, exercises and quiz questions at the end of each chapter, and extensive authors' and subject index. This book will be of interest to all students taking courses in electrical measurements as a part of a B.Tech. in electrical engineering. Professionals in the field of electrical engineering will also find the book of use.

In large surface mining operations, drilling and blasting activities constitute more than 15% of the total costs. In order to optimize performance and minimize costs, a thorough knowledge of drill and blast operations is, therefore, extremely important.In this unique reference volume, rotary blasthole drilling and surface blasting, as applied in la

Soft Computing Approach to Evaluate and Predict Blast Vibrations

Effects and Operations

Proceedings of the 2nd International Conference on Human Interaction and Emerging Technologies: Future Applications (IHET - AI 2020), April 23-25, 2020, Lausanne, Switzerland

Open Pit Mine Planning & Design

Mine Planning and Equipment Selection 2000

This book is a comprehensive and objective study of the theory and construction methods of metro construction in hard rock stratum. It is based on the construction of the Qingdao metro and provides key techniques for metro construction in hard rock stratum in a systematic manner. Detailed data, accurate charts and pictures are provided to guide future metro construction in hard rock stratum in China.Divided into six chapters, Key Technologies of Metro Construction in Hard Rock Stratum covers various construction technologies in hard rock stratum including (1) drilling and blasting construction technology, (2) open-cut station construction technology, (3) subsurface excavated station construction technology, (4) grouting reinforcement technology in adverse geological section, and (5) standardized metro construction technology. It can be used as reference for design, construction, monitoring or supervision staff as well as teachers and students engaged in metro and underground construction to facilitate exchange of ideas.

This book reports on research and developments in human-technology interaction. A special emphasis is given to human-computer interaction, and its implementation for a wide range of purposes such as healthcare, aerospace, telecommunication, and education, among others. The human aspects are analyzed in detail.

Timely studies on human-centered design, wearable technologies, social and affective computing, augmented, virtual and mixed reality simulation, human rehabilitation and biomechanics represent the core of the book. Emerging technology applications in business, security, and infrastructure are also critically examined, thus offering a timely, scientifically-grounded, but also professionally-oriented snapshot of the current state of the field. The book is based on contributions presented at the 2nd International Conference on Human Interaction and Emerging Technologies: Future Applications, IHET-AI 2020, held on April 23-25, in Lausanne, Switzerland. It offers a timely survey and a practice-oriented reference guide to researchers and professionals dealing with design and/or management of the new generation of service systems.

This book is a unique supplement to contemporary scientific literature on rock blasting technology. It encapsulates theoretical and practical aspects of drilling and blasting techniques used in both surface and subterranean excavations connected with civil as well as mining activities. Case studies are presented to illustrate correlations between theoretical calculations and empirical findings. It also summarizes the results of research carried out by the Blasting Department of the Central Mining Research Institute since its inception in the year 1970. It contains fifteen extensive chapters covering statistical methods, design parameters, rock breakage mechanism, structural damage, fragmentation, emerging techniques, surface and sub-surface blasting methodologies, safety and environmental aspects, explosive characteristics and modern initiating devices.

Rock Fracture and Blasting

Mining Engineering Analysis

Information Circular

Mine Planning and Equipment Selection 2004

Open-pit Copper Mining Methods and Practices, Copper Cities Division, Miami Copper Co., Gila County, Ariz

The full texts of Armed Services and othr Boards of Contract Appeals decisions on contracts appeals.

This work covers such topics as: EU directives and harmonization work; health, safety and environment; recent technical development - products and processes; shot hole development; and management of blasting operations.

Underground Mining Methods: Engineering Fundamentals and International Case Studies presents the latest principles and techniques in use today. Reflecting the international and diverse nature of the industry, a series of mining case studies is presented covering the commodity range from iron ore to diamonds extracted by operations located in all corners of the world. Industry experts have contributed sections on General Mine Design Considerations; Room-and-Pillar Mining of Hard Rock/Soft Rock; Longwall Mining of Hard Rock; Shrinkage Stoping; Sublevel Stoping; Cut-and-Fill Mining; Sublevel Caving; Panel Caving; Foundations for Design; and Underground Mining Looks to the Future.

Designing Blast Patterns Using Empirical Formulas

Rock Fragmentation by Blasting

Drilling and Blasting of Rocks

Drilling and Blasting

Engineering Rock Blasting Operations

*Spearheading the promotion of international technology transfer in the fields of mine planning, mining systems design, equipment selection and operation techniques, the International Symposium on Mine Planning and Equipment Selection is recognised by the mining society as a key annual event in highlighting developments within the field. Here in this volume, proceedings from the thirteenth annual symposium concentrate on the following major topics: * open pit and underground mine planning, modelling and design * geomechanics * mining and processing methods * design, monitoring and maintenance of mine equipment * simulation, optimization and control of technological processes * management, mine economics and financial analysis * health, safety and environmental protection. Including 147 papers from leading experts and authorities, Mine Planning and Equipment Selection undoubtedly provides valuable information and insight for a range of engineers, scientists, researchers and consultants involved in the planning, design and operation of underground and surface mines.*

In this book, Dr. Soofastaei and his colleagues reveal how all mining managers can effectively deploy advanced analytics in their day-to-day operations- one business decision at a time.

Most mining companies have a massive amount of data at their disposal. However, they cannot use the stored data in any meaningful way. The powerful new business tool-advanced analytics enables many mining companies to aggressively leverage their data in key business decisions and processes with impressive results. From statistical analysis to machine learning and artificial intelligence, the authors show how many analytical tools can improve decisions about everything in the mine value chain, from exploration to marketing. Combining the science of advanced analytics with the mining industrial business solutions, introduce the “Advanced Analytics in Mining Engineering Book” as a practical road map and tools for unleashing the potential buried in your company’s data. The book is aimed at providing mining executives, managers, and research and development teams with an understanding of the business value and applicability of different analytic approaches and helping data analytics leads by giving them a business framework in which to assess the value, cost, and risk of potential analytical solutions. In addition, the book will provide the next generation of miners - undergraduate and graduate IT and mining engineering students - with an understanding of data analytics applied to the mining industry. By providing a book with chapters structured in line with the mining value chain, we will provide a clear, enterprise-level view of where and how advanced data analytics can best be applied. This book highlights the potential to interconnect activities in the mining enterprise better. Furthermore, the book explores the opportunities for optimization and increased productivity offered by better interoperability along the mining value chain - in line with the emerging vision of creating a digital mine with much-enhanced capabilities for modeling, simulation, and the use of digital twins - in line with leading “digital” industries.

This book gives a rigorous and up-to-date study of the various AI and machine learning algorithms for resolving environmental challenges associated with blasting. Blasting is a critical activity in any mining or civil engineering project for breaking down hard rock masses. A small amount of explosive energy is only used during blasting to fracture rock in order to achieve the appropriate fragmentation, throw, and development of muck pile. The surplus energy is transformed into unfavourable environmental effects such as back-break, flyrock, air overpressure, and ground vibration. The advancement of artificial intelligence and machine learning techniques has increased the accuracy of predicting these environmental impacts of blasting. This book discusses the effective application of these strategies in forecasting, mitigating, and regulating the aforementioned blasting environmental hazards.

Blast Design

New Developments in Mining Engineering 2015

Rock Mechanics, Drilling & Blasting

Environmental Issues of Blasting

Introductory Mining Engineering

Drilling and blasting is one of the most economical methods used for the exploitation of economic minerals from the earth crust. Ground vibrations induced by blasting are one of the fundamental problems in the mining industry due to its consequence on structural stability of buildings, socio-economical and the public involvement. Frequency is also another important parameter for the safety and stability of existing surrounding structures. There are number of vibration predictors available proposed by different researchers for the prediction of peak particle velocity (PPV) and to calculate safe charge for smooth and trouble free blasting but all the predictors are mainly based on parameters, like explosive charge used per delay and distance from the blast face to monitoring point. However, frequency prediction has been ignored while calculating the safe charge. It is well known that blast vibration is influenced by rock, explosive and blast design parameters. This book deals with assessment of the existing predictors capability vis-à-vis application of soft computing tool to compute the PPV and frequency based on rock, blast design and explosive parameters.

Drilling and blasting are seen as sub-systems of size reducing operations in mining. To have better design parameters for economical excavation of mineral production and fragmentation, the comminution and fragmentation operations need to be studied and optimized independently, as well as together, to create optimized use of energy and cost-effective operation. When there is a change in drillhole diameter or fragmentation specification, changes in the blast design parameters are required affecting the cost of a drilling and blasting operation. A model was developed to calculate blast design parameters and costs on the basis of the required 80% fragment size needed for crusher operation. The model is based on previously developed fragmentation models, found in the literature. The model examines the effect of drilling diameter on blasting requirements to achieve certain fragmentation targets and calculates blast design parameters and costs for a range of diameters from 75 to 350 mm. To examine the effectiveness of this model, two different 80% passing sizes of fragments have been considered. It was shown that cost optimization occurs at an intermediate diameter, since there are opposing trends of the effect of diameter on powder factor and accessories needed. To achieve a certain fragmentation target, the total cost of drilling and blasting shows a clear trend allowing an optimum selection of diameter. The selected diameter also allows the examination of the suitability of the drill machine under the given geological and operational conditions of the drilling site.

A comprehensive and illustrated desk reference with terms, definitions, explanations, abbreviations, trade names, quantifications, units and symbols used in rock mechanics, drilling and blasting. Now including rock mechanics as well, this updated edition presents 5127 terms, 637 symbols, 507 references, 236 acronyms, 108 formulas, 68 figures, 47 ta

Human Interaction, Emerging Technologies and Future Applications II

Applied Explosives Technology for Construction and Mining

Board of Contract Appeals Decisions

Rock Blasting

Electrical Measuring Instruments and Measurements

This annual series of books includes scientific papers on mining profiles. This volume presents multiple aspects of mining technology implementation in several aspects: extraction of coal, iron, manganese, uranium and other ores. Capturing and utilization of coalbed methane by various methods including alternative ones, safety measures in mining, ecological aspects, etc. Specific attention is paid to intensification of mineral resources extraction processes by way of modernizing opening methods, development and mining methods depending on mining-geological conditions. Experimental results of stress-strain state rock massif forecast by means of computational experiments using recursive methods are also discussed. Any mining operations should finally result in adequate recovery of land surface and utilization of mining wastes using various environmentally friendly methods, thus, sufficient attention is paid to this scientific trend. Non-traditional methods of minerals mining are becoming more topical and of higher demand in the modern society. Hence, several papers/chapters are devoted to underground coal gasification and its subsequent processes. In addition, extraction technologies of gas hydrate, as a source of an abundant amount of natural gas, are thoroughly examined in this book, including implementation of gas hydrate technologies for mine methane utilizations with its following transportation in a solid state. Furthermore, attention is given to evaluation of economic efficiency of minerals mining by the proposed methods, their ways of enrichment, ecological aspects and the influence of mining production on the environment, innovational logistic solutions at mining enterprises, and also to perspectives of Ukraine's mining industry integration to the European standards.

Rock Fracture and Blasting: Theory and Applications provides the latest on stress waves, shock waves, and rock fracture, all necessary components that must be critically analyzed to maximize results in rock blasting. The positioning of charges and their capacity and sequencing are covered in this book, and must be carefully modeled to minimize impact in the surrounding environment. Through an explanation of these topics, author Professor Zhang's experience in the field, and his theoretical knowledge, users will find a thorough guide that is not only up-to-date, but complete with a unique perspective on the field. Includes a rigorous exposition of Stress Waves and Shock Waves, as well as Rock Fracture and Fragmentation Provides both Empirical and Hybrid Stress Blasting Modeling tools and techniques for designing effective blast plans Offers advanced knowledge that enables users to choose better blast techniques Includes exercises for learning and training in each chapter

This textbook sets the standard for university-level instruction of mining engineering principles. With a thoughtful balance of theory and application, it gives students a practical working knowledge of the various concepts presented. Its utility extends beyond the classroom as a valuable field reference for practicing engineers and those preparing for the Professional Engineers Exam in Mining Engineering. This practical guidebook covers virtually all aspects of successful mine design and operations. It is an excellent reference for engineering students who are studying mine design or who require guidance in assembling a mine-design project, and industry professionals who require a comprehensive mine-design reference book. Topics include everything from mine preplanning to ventilation to pumping, power, and hauling systems. The text presents widely accepted principles that promote safe, efficient, and profitable mining operations. The book is an excellent text and self-study guide. Each chapter is organized to demonstrate how to apply various equations to solve day-to-day operational challenges. In addition, each chapter offers a series of practice problems with solutions.

Geotechnical Engineering Handbook, Procedures

Underground Mining Methods

Engineering Geology Field Manual

Application to Mining and Civil Engineering Projects

Mining and Rock Construction Technology Desk Reference