



Asia Masters Center

Cement Quarries Drilling and Blasting



Asia Masters Centre (AMC), Suite 2 B, level 6, Office Block, Grand Millennium Hotel, Bukit Bintang Street,
55100 Kuala Lumpur, Malaysia. | Tel: +60327326992 | Mobile: +601 8909 0379 | Fax: +60327326992
Website: <http://www.asiamasters.org/> | Email: info@asia-masters.com



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Cement Quarries Drilling and Blasting

➔ Course Overview

This course has been developed to quarry operation.

Quarrying is the breaking of the rock in a safe and economic way and transporting the result to a plant for further reduction in size. This involves planning, purchasing of suitable equipment, drilling, blasting, loading and transport of rock in quantities sufficient to permit the continuous operation of the cement plant. All this must be accomplished as efficiently and safely as possible to maximize the return on investment. Finally environmental considerations must be remembered and careful control kept on noise and dust levels. Parts of the quarry that become worked out must be rehabilitated so that there are few scars on the landscape.

➔ Course Objective

After completing this course participants will have:

- The General basics of Geology (Elements, Minerals, types of rocks & Rocks for the cement industry).
- The nature of cement raw material.
- In-depth understanding of the.
 - Drilling.
 - Blasting.
 - Types of Explosive.
 - Explosive Initiation Systems.
 - Environmental Effects of Blasting.
 - Secondary Breaking.



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- Quarries machinery and Evaluation of quarry machinery.
- The skills in daily quarry operation will be improved.
- Familiarize the trainees with principals of crushing, the types of crushers and Crushing Operation.

➔ Target Audience

- This course will have a particular focus for people working in the Cement Quarries operation and process control Engineers, Quarries supervisors, Quarries technicians, Cement Quality control and laboratory engineers.

➔ Course Outline

Module (01) General Geology.

- 1.1 INTRODUCTION
- 1.2 GEOLOGY AND GEOGRAPHY
- 1.3 Rock Hardness
- 1.4 Influence of Rock Characteristics
- 1.5 Influence on the Blasting Process
- 1.6 Topography

Module (02) DRILLING

- 2.1 Drilling Methods
 - 2.1.1 Rotary Drilling
 - 2.1.2 Percussion Drilling
- 2.2 Comparison of Drill System
 - 2.2.1 Top Hammer
 - 2.2.2 Down the Hole
 - 2.2.3 Rotary
- 2.3 Drilling Parameters



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- 2.3.1 Capital
- 2.3.2 Nature of the Rock
- 2.3.3 Fragmentation Size Distribution
- 2.3.4 Monthly tonnage requirements
- 2.3.5 Cap Rock
- 2.3.6 Vibration and Airblast
- 2.4 Drilling Definitions and Equations
 - 2.4.1 Borehole Diameter
 - 2.4.2 Burden
 - 2.4.3 Spacing
 - 2.4.4 Bench Height
 - 2.4.5 Subdrill
 - 2.4.6 Vertical and Inclined Holes
 - 2.4.7 Drill Hole Deviation or Wander
 - 2.4.8 Collaring
- 2.5 Drilling Patterns
 - 2.5.1 Square
 - 2.5.2 Rectangular
 - 2.5.3 Staggered

Module (03) BLASTING

- 3.1 History of Explosives
- 3.2 Breaking Process
- 3.3 Explosive Properties
 - 3.3.1 Velocity of Detonation
 - 3.3.2 Density
 - 3.3.3 Detonation Pressure
 - 3.3.4 Energy
 - 3.3.5 Strength
 - 3.3.6 Sensitivity
- 3.4 The Process of Detonation



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- 3.5 Efficiency of Explosives
- 3.5.1 Coupling Ratio
- 3.5.2 Diameter
- 3.5.3 Priming
- 3.5.4 Stemming
- 3.6 Explosive Selection
- 3.7 Powder Factor
- 3.8 Energy Factor

Module (04) INITIATION SYSTEMS

- 4.1 Electric Detonators
- 4.1.1 Detonators
- 4.1.2 Circuit Wiring
- 4.1.3 Power Source
- 4.2 Detonating Cord
- 4.3 Blasting Cap
- 4.4 Nonel
- 4.5 Delay Blasting
- 4.6 Blasting Patterns

Module (05) EFFECTS OF BLASTING

- 5.1 Fragmentation
- 5.1.1 Terminology
- 5.1.2 Quality of Explosives
- 5.1.3 Rock Characteristics
- 5.1.4 Blast hole loading
- 5.1.5 Drilling Accuracy
- 5.1.6 Timing and Pattern
- 5.2 Muck pile
- 5.2.1 Drill Hole Angle
- 5.2.2 Surface Timing
- 5.2.3 Free Face



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- 5.2.4 Fragmentation Analysis
- 5.3 Ground Vibrations
 - 5.3.1 Source of Ground Vibrations
 - 5.3.2 Defining Peak Particle Velocity
 - 5.3.3 Techniques to reduce Vibration Levels
- 5.4 Air blast
 - 5.4.1 Atmospheric Conditions
 - 5.4.2 Minimizing Air blast
- 5.5 Fly rock

Module (06) LOADING AND MUCKING

- 6.1 Selection of Equipment
- 6.2 Non-Explosive Mining
 - 6.2.1 Continuous Mining Systems
 - 6.2.2 Semi-continuous
- 6.3 Haul Road
 - 6.3.1 Loaders
 - 6.3.2 Trucks as Haulers
 - 6.3.3 Rolling Resistance
 - 6.3.4 Grade Resistance
 - 6.3.5 Effective Grade
 - 6.3.6 Cost Relationship
- 6.4 In Pit Crushing

Module (07) Contracting out the Quarry Operation

Module (08) RECLAMATION

- 8.1 Restoration to Agricultural Land
- 8.2 Forestry
- 8.3 Recreational
- 8.4 Nature Conservation
- 8.5 Urban Uses

Module (09) THE FUTURE

- 9.1 Drilling
- 9.2 Explosives
- 9.3 Accessories
- 9.4 Controls
- 9.5 Planning

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Price (USD)

Communicate with the training department
to know the participation fees

➤ **There are offers and discounts for groups**

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