

AMMI-19 ROCK FRAGMENTATION

UNIT-1 GENERAL THEORY OF ROCK CUTTING

1.1 Selection of cutting tools for optimum penetration and wear characteristics.

UNIT-2 MECHANICS OF ROTARY

- 2.1 percussive and rotary - percussive drilling, short and long hole drilling equipment,
- 2.2 Different types of bits, bit wear, drilling in difficult formations,
- 2.3 Drill ability of rocks, drilling performance and costs.

UNIT-3 MECHANISM OF ROCK BREAKING MACHINES

- 3.1 Pneumatic and Hydraulic rock hammers.
- 3.2 Mechanics of rock fragmentation and fracture by explosive action, explosives. .

UNIT-4 BLASTING ACCESSORIES

- 4.1 Blasting parameters, design of blasting rounds for opencast and underground mines,
- 4.2 Blastability of rocks, blasting efficiency, mean fragment size.

UNIT-5 COMPUTATIONAL MODELS OF BLASTING

- 5.1 Transient ground motion, misfires, blown out shots, incomplete detonation
- 5.2 Their causes and remedial measures.

UNIT-6 CONTROLLED BLASTING TECHNIQUES

- 6.1 Perimeter blasting, safety precautions, ground vibrations and air over pressure from blasting.
Instrumentation in blasting, Borehole pressure transducer,
- 6.2 V.O.D Probe, vibration monitor, high speed Video Camera. Impact of ground vibration and sound on the neighboring structures and communities, and mitigative measures.
- 6.3 Course Outcome: The student will understand the basic techniques required for rock fragmentation.
- 6.4 This require proper understanding of the mechanism required to fragment the rock,
- 6.5 Types of drilling and blasting practices involved for the proper design and excavation

Reference Book:

- 1. "Drilling & Blasting" Minetech by Pradhan G.K., Ghose A.K.
- 2. Advance in Drilling and Blasting by SASTRY V.R Course outcome: Upon completion of the subject, students will be able to Apply the systems concept for the design of production and service systems;