

Underground Mining of Metalliferous Deposits
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Lecture 33
Stope and Pillar – I

STOPE AND PILLAR METHOD

- **Stope and pillar** (variant of breast stoping), is a mining system in which a series of open stopes are made from a series of raises connecting two levels.
 - The series of short-span stopes are separated by the mined material is extracted across a horizontal plane, creating horizontal arrays of rooms and **pillars**. To do this, "rooms" of ore are dug out while "**pillars**" of untouched material are left to support the roof overburden.
 - To differentiate it from standard room and pillar designs, it has been named STOPE & Pillar
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- ❖ **Applicability:** This method is used where the ore body **width is between 1.5 to 4.0m**
 - ❖ **Host rock/Hangwall:** moderate to strong
 - ❖ **Orebody:** weakly moderate to strong
 - ❖ **Dip:** 30-40 degree
 - ❖ **Temporary support:** Timbers for temporary support should be available
 - ❖ **Backfill materials:** should be available specially for deeper levels
 - ❖ **Type of stope:** OPEN STOPE (at shallow depth) and Back-filled type (at higher depth)*
 - ❖ **Pillars are not left within the stopes** except in rare cases of geological disturbance
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- **Stope and pillar** is a mining system in which a series of open stopes are made from a series of raises connecting two consecutive levels.
 - Firstly, we divide the mineable ore in **BLOCKS** and we assign each of them with coordinates to identify them, for example, 1270N-1370N Block.
 - Mineable blocks are then developed with **block-end raises**.

- Before preparing the blocks for mining, a number of raises are driven in between block-end raises.

The number of such raises depends on the design of the stope:

- Span of the open stopes
- Width of rib pillars
- Span of the open stopes
- Width of rib pillars

Each of these raises act as a **center raise** for one stope.

Typical spans in Indian Copper Complex (Hindustan Copper Complex):

Shallow depth : 15m span with 4m Rib pillar (up to 500 feet)

Higher depth: 10m span with 3m Rib pillar

Systematic development

- I. Lateral development i.e. drives (2.4m×2.4m)
- II. Connecting raises (2.2m×1.5m)

Note: Location of Block-end raises is usually decided by adequacy of ventilation in the advancing drives

- Upper level has to advance faster to facilitate availability of Raising points
- Since productivity depends also on number of stopes being mined at a time, a large number of fully developed raises must be available
- For faster development of Raises, we can use a centre hole drilled from the upper level to its immediate bottom level

For better stability from the rock mechanics point of view, Raises must be staggered

- All drives and raises must be provided with supports during the process of development
- All raises must have chutes and adequate protections so that the haulage drives are free from any obstacles

- If the raises are not to be used immediately, barricades may be provided at the bottom for safety