

Underground Mining of Metalliferous Deposits
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Lecture 40
Shrinkage stoping - II

SHRINKAGE STOPING

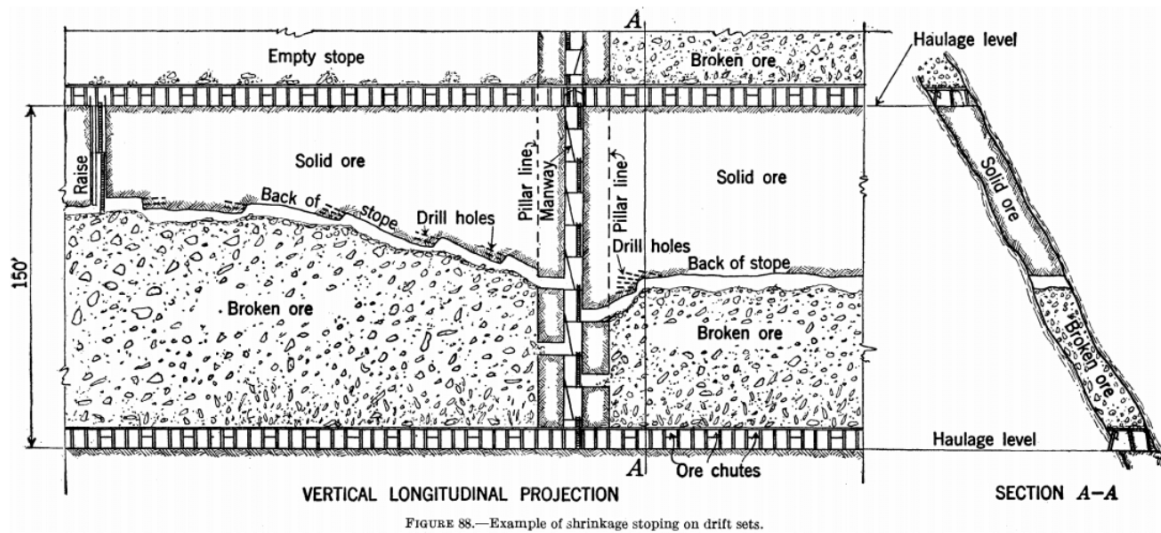


FIGURE 88.—Example of shrinkage stoping on drift sets.

Figure 1. Example of shrinkage stoping on drift side

Description of the method in details

- On construction of developmental works, the stoping is commenced with the initial cut taken from the raise just above the sill.
- Horizontal drilling is carried out and the blasted ore is allowed to drop on the ore-chute/finger raise.
- Partial ore is removed from the finger raise to allow the height of open space in the stope of 2 m. So, 20 – 30% of the blasted muck is removed and rest is stored in stope.
- The subsequent lifts are taken by overhand drilling and blasting.
- Depending on the strength, hangwall and footwall are supported. Barricades may be provided at hangwall side to avoid ore degradation.
- Occasional pillars are kept for wide deposits.
- Face machineries used are – Drill, LHD etc.

- Crown pillar is left as per the requirement.
- Timber support may be used as temporary support.
- Rock fall increases with the reduction in crown thickness
- Usually up to 30 percent of the ore is drawn off during active mining.
- The remaining ore serves as a floor upon which to work in drilling the back for the succeeding cuts and also provides some support of a temporary nature to the stope walls.
- For this reason shrinkage stopes are considered to be a form of artificially supported stope, although undoubtedly there are good reasons why some consider them to be open stopes.
- In narrow veins or lodes and those of moderate width, the stopes usually are run longitudinally and are mined from wall to wall without leaving pillars, except locally, to support bad ground or where the ore is too low-grade to be mined profitably.
- In wide ore, to reduce the unsupported span of the stope back, it may be necessary to mine the ore in a series of transverse stopes between intervening pillars of ore. The stopes then end against the walls of the vein and the sides are vertical pillars of ore.
- After active mining has been completed to the level above or to the floor pillar, the rest of the broken ore is drawn off from below, leaving the stope empty. It may be filled with waste later to prevent general movement and subsidence or to permit mining of pillars left between stopes during the first mining.
- Stulls may be employed during active mining to support local patches of insecure ground.
- Where the width is not too great, they often are employed when the stope is being emptied to protect the miners from falls of loose ground while cleaning down broken ore that has hung on the footwall and recovering ore that was left in the walls during stoping.
- Stulls 30 to 40 feet long have been used for this purpose, but the safety and adequacy of this type of support are questionable for widths as great as this.

- While stuffing from the top down during drawing of the stope, the miners stand on the top of broken ore while placing the timbers to support patches of insecure wall rock. After the ground has been secured thus, drawing and cleaning down are resumed.

Features

1. Suited to smaller scale operations –moderately low production
2. Labour intensive, dangerous work conditions
3. Low capital investment
4. Moderately selective
5. Majority of ore tied up in the stope
6. Ore subject to oxidation, packing and spontaneous combustion in stope
7. Variations: Vertical Crater Retreat

