

"safety props "which prevents the goaf rock from gravitating down the raise when roof rock caves in after coal extraction. Funnel is extracted 1.2m x 1.5m in by of the raise under extraction, 4.5m out by and 0.3m – 0.6m. below the roof with exposed floor. This funnel serves as bunker and guides the blasted coal to the raise for subsequent gravity flow.

SLOT CUTTING

After completing the funnel, holes are drilled for first in – by ring, slot is started from the X-M already developed during funnel making operation at ring level just above the 2nd sub level. It is made between 2nd sub level and 1st sub level above the ring level from where ring holes are drilled & blasted. Width of the slot is extended from floor to 0.3m to 0.6m below the roof. The slot is made by dip and rise holes drilled and blasted from the XM. This operation provided free face to the ring hole blasting from the ring level.

RING HOLE BLASTING

Before the slot is started, the ring holes are drilled in the in-by pillar with a burden of 1.2m to 1.5m and then the slot is completed. All the holes in the ring are blasted simultaneously. Rings are designed according to the seam thickness, gradient and interval between level and sub-levels. Charges per hole and length of holes are predetermined. Ring holes are drilled in the out-by pillar also and blasted till 4.5m pillar is left against the next raise. These operations are repeated in the subsequent raises and line of extraction is kept diagonal. When seam thickness exceeds 6m, one more set of levels and sub levels are developed in the hang wall side with the help of short X-M. Funnel and slots are connected and two rings are drilled and blasted simultaneously or hang wall side ring is blasted first. Blasted coal gravities down the raise to the nearest conveyor and finally to main loading chutes

These SYSTEMATIC SUPPORT (S.S.R) rules shall be applicable to depillaring working of 60ft. Seams for DS-4A panel of Dip Mine, Tipong Colliery. The S.S.R. has been framed on the RMR of value 29.25 seam as determined by CMPDIL. Physico-Mechanical properties of the seam shall be monitored by geologist from time to time.

Support of goaf edges i.e, edges of chamber & level / sublevels leading to goaf.

The goaf edges leading to the chamber shall be kept supported either by chocks set skin to skin or X- bars set on chocks/props at maximum length of 0.6m and for length of sublevels leading to the chamber.

The sides and the roof against the X-bar shall be suitably lagged.

The goaf edges shall be kept fenced with props set skin to skin under the X-bar to stop entry of work persons inside the chamber.

Support of levels / sub-levels / X-measures etc. including the development heading/driving in advance of the line of extraction.

All levels / Sub-levels / x-measures etc. shall be kept supported by X-bars set on chocks / props at a maximum interval of 1.2m. The sides & roof against the X-bars shall be suitably lagged.

The freshly exposed roof shall be supported with X-bars set over timber / round prop not less than 6 inch. Diameter with advancing lagging so that at no time or place the roof is left unsupported.

Support of raise galleries / splits including the development headings.

The raises shall be supported by two rows of props set not more than 1.2m apart. These props shall be set touching the pillars side so as to allow passage of workmen to travel and shall be suitably lagged for supporting the sides.

The freshly exposed roof in the raise shall be supported with X-bars set over props with advanced laggings so that at no place or time the roof of the raise is left unsupported.

Support of junction of raises and sub-levels / levels as well as other junction.

All junctions shall be supported X-bars over props / chocks at a maximum interval of 1.2m and the X-bar/ prop shall be suitably lagged on both roof and sides.

Where the width of the junction to be supported is more than 3m, along the adjoining corners , it shall be supported by X-bars set not more than 0.3m apart over chocks/props set on either side of raise leaving sufficient space for work persons to pass.

The junction of the level shall be supported by X-bars set 0.3m apart with adequate number of laggings in roof and sides. If the width of the junction becomes more than 4.2m. the galleries shall be supported by x-bars set over masonry wall.

The lids and wedges used with props shall have width not less than the diameter of the props and thickness not less than 8cm and the length not less than 0.5m

Where the floor Coal is taken, the props shall not set on the coal stumps and the shorter props shall immediately be replaced with the longer props. Where the roof coal is taken the shorter props shall immediately be replaced with longer props and the lip of coal shall be supported with a cog.

The timber used in the construction of cog shall not be less than 1m in length and shall have at least two opposite side joggled flat to provide suitable bearing surface.

Props shall be set on solid floor and not on loose packing or materials. This shall be

Kept tight against the roof. Where it is to be set on the sand, a flat base piece of not

Less than 4 to 5 cm thick, 25cm wide and 0.75m long shall be used

X-bars shall be supported on props / chocks set touching the sides. Every X-bar shall be made tight against the roof. Props shall be made tight against the pillar side and the number of laggings used on a X-bar and side props shall not be less than 1m for every 0.3m length of the bar / prop and the laggings shall be kept tight.

Chocks shall be set on solid floor and not on loose packing or materials. They shall be kept tight against the roof to ensure maximum contact between the roof and the timber.

At no time and place person shall be allowed to enter inside the chamber / funnel unless the roof is kept supported with X-bars set 1.2m apart or with row of props set

1.2m apart both between the rows as well as between the props.

Also at no time and place persons shall be allowed to cross the chute raise.

The above mentioned support shall be set in the entire working including development workings being made in advance of the line of extraction.

In all raises, steel or manila rope shall be provided for use as hand rails for the persons working / walking in the raise.

The raise side goaf shall be isolated by full barricade construction in the following manner:

Two rows of vertical props erected by cutting recess both in the roof and the floor.

The vertical members shall be set at an interval of 15cm between the props in the same rows and in the interval of 1.0m between the rows

The horizontal member shall be put skin to skin, so that whole area of the raise is covered.

Skin to Skin support shall be erected in the geological disturbed area.

Additional support shall be erected as and when necessary.

Unless otherwise specified, material used for prop shall be sawn timber or pit prop or hollow section steel, material used for X-bar shall be sawn timber or pit prop or hollow section steel or I-section girder; material used for lagging shall be sawn timber

or pit prop or bamboo.

ADVANTAGES

Safety is more, the workman's need not to work under unsupported roof. Due to the blasting efficiency the percentage of coal extraction increased to 45% in seams more than 6m thick and 60% in seam less than 6m thick

SCOPE OF THIS METHOD

Applicability in thick and steeper seams

CONCLUSION- Tipong method is one of the most rarely known mining methods which are mainly practice in high gradient seam ranging between 40 to 50. Therefore this method is very useful in extracting large amount of coal deposit where the mining conditions are highly difficult due to high gradient and steepiness.