

Project title: Advice for Preparation of Strata Control and Monitoring Plan (SCAMP) for the Development of VIII Seam of 6&7 Pits Bhutgoria Amalgamated Colliery, Tata Steel Limited

Project No.: CNP/4908/2019-20

Executive Summary: The virgin patches of the VIII seam of 6&7 Pits Bhutgoria Amalgamated Colliery, Tata Steel Limited are to be developed by the Road Header. The thickness of the seam is varied from 2.8-3.01m as per borehole no. T6&7U/248/15. The depth of covers of the VIII seam is 354-576m. The average thickness and depth of cover of the seam are 2.9m and 465m respectively. The immediate roof consists of sandstone. The adjusted RMR of the sandstone roof is 44.64. The development of the VIII seam is proposed to be carried out with a maximum height and width of the gallery of 3.0m and 5.5m respectively.

The management of Tata Steel Limited requested Director, CSIR-CIMFR, Dhanbad for advice to prepare the strata control and monitoring plan (SCAMP) for the development of VIII seam. Accordingly, the study has been undertaken for preparation of SCAMP including stability analysis of the surrounding rock mass during the development of the VIII seam by the Road Header.

Three-dimensional elasto-plastic numerical modelling has been carried out to understand the stress regimes and the failure characteristics of the surrounding rock mass during the development. The modelling is done as per the lithology, the physico-mechanical properties and the geomining conditions provided by the mine management. Some of the unknown parameters are assumed based on the experience and engineering judgment. It is found from the study that the pillar size of 50m x 50m (centre to centre) has the safety factor more than 2 which can be considered as long-term stable. The support system is designed based on the rock load height which is equal to the yielded height of the roof rock as obtained from the numerical modelling. The support system is designed in combination with roof bolts of 1.95m length including the threaded portion. The anchorage strength of full column resin grouted roof bolt (a least 1.8m grouted length) is considered as 16t. The safety factor of the support system is kept more than 2.

	<p>The side supports are designed with the bolts. The strata control and monitoring plan is suggested with suite of geotechnical instruments. The details of the above are discussed in the respective sections of this report.</p>
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