

FLAC. A simple excavation shape and a more realistic open stope hangingwall reinforcement problem are analysed. Results are qualitatively consistent with field behaviour.

886255

Estimating the degree of reinforcement of horizontally bedded roofs strengthened by non-tensioned, full-column grouted bolts
Stimpson, B

Int J Min Geol Engng V5, N3, Oct 1987, P273-284

Full column untensioned bolts are installed in bedded roof strata to minimise sag, convergence, and displacements along separation planes. Ultimately the bedded strata act as a single layer. A limit equilibrium method is presented to determine the degree to which ideal reinforcement is achieved. Examples illustrate estimation of the degree of reinforcement of a given bolt pattern, and of bolt pattern requirements for a specified degree of reinforcement.

886256

Optimising the reinforcement effect of full-column, untensioned, grouted bolts in bedded mine roofs
Stimpson, B

Int J Min Geol Engng V5, N3, Oct 1987, P285-298

Full column untensioned grouted bolts have greater shear stiffness than mechanical point anchor bolts, and are used in bedded mine roofs to minimise shear slip along separation planes, and thus reduce sag and convergence. Model tests to determine the optimum bolting pattern for roof beams under uniform or parabolic loading are described. Precise location of bolts is dependent on roof span, abutment thickness, beam thickness, and roof and abutment elastic properties.

886257

Analytical method for determining shear stiffness of an inclined grouted bolt installed across an open discontinuity
Stimpson, B

Int J Min Geol Engng V5, N3, Oct 1987, P299-305

Shear stiffness of a grouted bolt intersecting a discontinuity controls the amount of shear movement that can occur for a given shear force. An analytical model is developed for estimating the shear stiffness of a single bolt as a function of bolt inclination, hole and bolt diameter, bolt, grout and rock Young's moduli, and aperture (opening) across the discontinuity, and sensitivity studies conducted to determine the most significant of these variables as predicted by the model. Auth.

886258

Frickley colliery and FSVs

Lawson, T

Min Engr V147, N321, June 1988, P557-562

The roof bolting system of face salvage used at Frickley colliery, South Yorkshire, is presented. The design, machine selection, convergence restriction and monitoring of pilot scheme, and modifications made as a result, are described. The introduction of free steered vehicles for face to face transfer of powered supports is briefly described.

886259

Roof bolting techniques in the Swallow Wood seam at Silverwood colliery
Clay, D

Min Engr V147, N321, June 1988, P563-569

The Swallow Wood seam has a weak laminar mudstone roof, necessitating heavy duty supports. Heavy duty IFS powered supports are used and salvaged using roof bolting techniques.

Design of the roof bolting system and its implementation are described. Pull tests were conducted to determine the strength of the bolt/resin/strata bond, and bed separation and convergence were monitored.

886260

Development of roof bolting systems in North Yorkshire area
Sykes, G

Min Engr V147, N321, June 1988, P577-582

Experience with roof bolted face salvage in North Yorkshire is discussed. Monitoring shows that roof bolted face salvages behave predictably. Results suggest roof bolting has wide application for roadways. Partial extraction work at Allerton Bywater shows roof bolting may be an effective primary support.

886261

Sea cliff stabilization using long rock anchors - A case history
Kerwin, S T

Proc 28th US Symposium on Rock Mechanics, Tucson, 29 June-1 July 1987 P305-314. Publ Rotterdam: A A Balkema, 1987

Wedge failure of a sea cliff of siltstone over relatively competent breccia was controlled by an easterly inclined fault up and across the cliff face. A concrete retaining structure supported by 25-30m tendons anchored in competent rock below the fault surface was specified. Specialised construction techniques were needed to overcome access, slope geometry, and drilling condition problems. Initially installed anchors failed to meet specifications due to incorrect grouting. Further anchors were satisfactory.

886262

Design and construction of replacement rock anchors for the Royal Gorge Suspension Bridge, Canon City, Colorado
Tocher, R J; Franceski, J

Proc 28th US Symposium on Rock Mechanics, Tucson, 29 June-1 July 1987 P315-320. Publ Rotterdam: A A Balkema, 1987

Anchors installed in 1929 are evaluated and design and construction of the replacements in 1982 are discussed. Site investigation revealed Precambrian gneiss in the anchor location, with several widely spaced joint sets. Post-tensioned grouted anchors were specified, with the load from the cables transmitted through the transfer plate in the reaction block. Multiple anchors were installed at each cable location. Available loads exceeded 100 tonnes per anchor. Suspension cables were systematically spliced to tendons in the anchor.

886263

Stabilization, Barker Dam, Colorado, USA
Robinson, C S; Robinson, C H; Moss, A S E

Proc 28th US Symposium on Rock Mechanics, Tucson, 29 June-1 July 1987 P337-344. Publ Rotterdam: A A Balkema, 1987

The concrete gravity dam was strengthened by the installation of post tensioned anchors in the gneissic foundation rock. Surface mapping and drill core logging were used to define rock types and discontinuity orientation. Rock mechanical properties were determined on core samples, and drill holes logged and permeability tests carried out. A rock mass classification and rating were developed to help design the anchor system. Final design, to safety factor 2, was determined after finite element modelling and in situ anchor tests.