

Rock Bolting – Ground Control for Underground Gold Mines



Best Practice Series

BP-73

More ground control related injuries occur to miners while installing rock bolts than during any other task in the mining cycle. Miners who install rock bolts are usually working in a newly exposed, recently blasted area.

To Perform Their Jobs Safely, Rock Bolters Must:

- Never travel under unstable ground.
- Always visually examine the back, face, and ribs immediately before starting work.
- Keep a bar of suitable length nearby to scale down loose rock. (Pry Up, Not Down!)
- Always test back, face, and ribs; do not take shortcuts.
- Stay in a safe location under stable ground when installing rock supports.
- Never hold rotating drill steel while drilling bolt holes.
- Control respirable dust.

To Make Sure Rock Supports Are Installed Properly, Rock Bolters Must:

- Ensure that bolting equipment is in proper operating condition before installing bolts; this includes all levers, tram controls, panic bars, etc.
- Know and follow all manufacturers' recommendations on installation of bolts and resin.
- Check type (e.g. length and grade) and condition of supplies including bolts, plates, and grout to ensure that they are appropriate.
- Always follow proper bolt installation sequence starting from stable areas.

- Drill all holes to proper diameter and depth (not over one inch deeper than the bolt's length).
- Ensure that bearing plates firmly contact the back when installed, but are not deformed.
- Use the proper finishing bit when installing mechanical-expansion-anchor type bolts.
- Be sure resin is maintained at mine temperature before use.
- Follow manufacturer's recommendation for safe handling of resin.
- Check to ensure all bolts are installed in the proper tension (torque) range when applicable.
- Make sure bolts used to suspend loads extend at least 12 inches into competent ground.
- Drill additional test holes if there is a question about adverse ground conditions.
- Add additional supports at any indication of adverse ground conditions.

Rock bolters should be alert to ground conditions which may reduce the effectiveness of installed roof support systems:

- Fractures or open joints within the back or ribs (e.g. may cause friction stabilizer systems to suspend excessive dead weight loads).
- Sets of joints, fractures, or bedding planes which parallel the orientation of bolt installation (e.g. optimum orientation of installation may be to bolt across joints to "key" broken material together).
- Highly fractured or weak strata (e.g. may provide inadequate anchorage for mechanically anchored systems).
- Corrosive water (e.g. may degrade the integrity of susceptible bolts over time).

Rock bolters should inform coworkers of adverse ground conditions detected during drilling.

Communicate any concerns regarding ground support performance to your supervisor and other miners.