

## GROUND SUPPORT AND EXCAVATION MONITORING SYSTEMS

Global Mine Design Ltd (GMD) is highly experienced in the design and implementation of specialist ground support and excavation monitoring systems. Our experience is gained from years of developing ground support products in challenging ground conditions, where our integrated monitoring networks reinforce safe working conditions and provide input for ongoing data-driven mine planning decisions.

### GROUND SUPPORT DESIGN

With experience ranging from designing support systems of large-span chambers and mine workings kilometres below ground level to installing soil nails in embankment slopes, GMD knows that every situation is unique.

GMD begins ground support system design by accurately characterising influential ground properties using rigorous data collection techniques. We capture as-built information with the latest in laser and photogrammetry surveying technology. Our working models are designed to simulate site conditions and we may include statistical block simulation and complex numerical modelling, in order to test the suitability of our solutions.

Creating an effective ground support/reinforcement system means choosing the correct components, such as rockbolts and surface fixtures. GMD engineers have access to both in-house materials science expertise, as well as links to external research groups, and international studies of component performance.

GMD recognises that a design needs to be worth more than just the paper on which it's printed. All designs are provided in the form best suited to the level of expertise on site, which can include 3D design interactive documents for technical personnel or pocket-handbooks for site operating staff.



## EXCAVATION MONITORING SYSTEMS

Data driven decision-making leads to safer and more productive workplaces. Monitoring systems are an essential part of a ground support design, which allow for the serviceability of an excavation to be validated. GMD routinely builds monitoring systems into our ground support designs, using alarms and Trigger Action Response Plan protocols to ensure safe working conditions.

## GROUND SUPPORT QUALITY ASSURANCE AND QUALITY CONTROL

Auditing is important. Not just to ensure that an excavation is working as intended, but also to help foster a positive attitude of pride among the workforce.

GMD has worked with some of the largest mining companies in the world to develop ground support QAQC protocols tailored to their internal management systems, which audit the entire ground support cycle from procurement through to post-installation condition.

