An Integrated Field Mapping-Numerical Modelling Approach to Characterising Discontinuity Persistence and Intact Rock Bridges in Large Open Pit Slopes

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Field investigations were undertaken at three open pit mines and one major natural rock slope. Modified geotechnical field mapping techniques and remote sensing methods including LiDAR and photogrammetry were adapted for each site, in an effort to improve characterisation of discontinuity persistence and intact rock bridges. A fracture network engineering approach is proposed for trace mapping, with intensity factors to describe intact rock bridge trace intensity, $R_{21}$, and blast-induced fracture intensity, $B_{21}$.

Results from the field investigations form the basis for a conceptual numerical modelling trial, where finite element, distinct element, and lattice-spring codes are used to investigate the role of persistence and rock bridges in large open pit slopes. A damage intensity approach is introduced to characterise the fracturing induced within a slope, $D_{21}$. The results are used to make preliminary recommendations for improving field characterization and post-processing methods to assess discontinuity persistence and rock bridges in large open pits.