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Raise bore stability and risk assessment empirical database update

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ABSTRACT

The empirical McCracken and Stacey risk assessment method has been in use for more than 20 years to assess geotechnical stability issues for raise bored shafts. The methodology has been applied with various levels of success. Increasingly, trends in mining and civil tunnelling have been towards larger diameter, single pass, raise bored shafts to rapidly provide means of ventilation, material movement (ore passes), or emergency egress. Identifying and assessing potentially problematic zones before raise boring commences can allow for appropriate risk-based decisions on construction, or to investigate alternative solutions. The implementation of a proactive solution to raising through an identified weak zone is preferred to the application of an engineered solution to an area subjected to substantial instability or failure. Methods for investigating potentially problematic areas are discussed in this paper based on AMC's benchmarking data. Proactive investigation programmes resulting from these investigations are also discussed.

Previous publications discussing the benchmarking data have concentrated on Australian case studies. Increased efforts and recent updates have been made to expand the database to include international case studies. This has provided further refinement of lower bound 'raise bore rock quality index' (Qr) values, and various rock mass parameters for stability assessments. Information regarding time-dependent failure mechanisms and risk assessment strategies is also captured and presented.