

Rockmass Characteristics and its Influence on TBM Penetration Rate in Archeans and Meta-sedimentary Rocks of India

D. Ramakrishna^{1*,2} and N. Rajeshwara Rao²

^{1,2}*Dr.M.G.R. Educational and Research Institute, Maduravoyal, Chennai-600095(TN), India*

²*Department of Applied Geology, University of Madras, Guindy Campus, Chennai-600025(TN), India*

(*Corresponding author, Email: devalla.ram@gmail.com)

Abstract

TBM penetration rate prediction models were developed for the hard Archean granites, granite gneisses and Meta-sedimentary rock groups comprising of quartzites, quartz arenites and sandstone of peninsular India. Construction stage engineering geological mapping comprising of face logging resulted in rockmass characterisation of Archeans and Meta-sedimentary rock groups. Statistical correlation of TBM penetration rate (PR) with Rock quality designation (RQD), unconfined compressive strength (UCS), volumetric joint count (Jv) and rockmass class was carried out. The prediction model provides good correlation only in the Meta sedimentary rock group for RQD, UCS and rockmass class and good correlation only for RQD and rockmass class in the Archean group but poor correlation with UCS. There is an exponential increase of penetration rate with Jv in both the rock groups.

Keywords: TBM Penetration Rate, Rockmass Characteristics, Geological Mapping, Rockmass Classification, Rock Tunnel

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