

عنوان مقاله:

EPB-TBM Tunneling in Abrasive Soil Tehran Metro Tunnel Line 7, Iran

محل انتشار:

سومین کنفرانس منطقه‌ای و دوازدهمین کنفرانس تونل ایران (سال: 1396)

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خلاصه مقاله:

Abrasive soils can cause wear to the cutting tools and machine components and this has been observed in Line 7 of Tehran Metro project, Iran. This project includes 6498 m of tunnel. The ground along the tunnel route is formed by alluvial deposits, composed mainly of gravelly sand with clay/silt and sandy gravel with clay. Among the fluvial deposits there are some layers and/or lenses of sandy GRAVEL or gravelly SAND and/or clayey silty SAND with GRAVEL deposits containing different coarse fractions. Another noticeable phenomenon in these deposits is the considerable content of cobbles and boulders in the tunnel route. In order to determine the abrasiveness of cobbles and boulders, the Cerchar tests were carried out on samples collected from the tunnel route. The results shows that cobbles and boulders samples were classified as extremely abrasive rock. Furthermore, abrasiveness and wear potential of soils along the tunnel alignment were assessed based on newest approach. The wear potential of the soil shows the 88% of all samples at tunnel route were have wear potential between high to extremely high (high=36%, very high=51% and extremely high=1%). In this project, the number of cutting tools replaced were 1169, including 654 rippers, 357 scrapers and 153 disc cutters. As well as secondary wear on cutterhead has been observed. This paper will briefly discuss the observed impacts of abrasive ground and the lessons that can be learnt from this project. Primary and secondary wear were observed on cutterhead of machine in this length of tunnel, including wear on cutting tool, cutterhead body. The major potential factors on wear including abrasive ground condition, and operational parameters were assessed and it was found that the main cause of the observed wear are geology (coarse grains, cobbles and boulders) in this phenomenon and soil conditioning parameters. This study briefly reviews the effects of this parameter in damages on cutterhead bodies.

کلمات کلیدی:

Abrasive soil, Soft ground, EPBM, Mineralogy, Cerchar test, Tehran Metro Line 7

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