Soil Nailing For Failed Slope Stabilization on Hilly Terrain

Mr. Shuvranshu Kumar Rout

Mr. Manos De

Dr. Anup Kumar Mandal

Mr. Biswajit Das

Tata Consulting Engineers Ltd., Pipe Line Road, Sakchi, Jamshedpur, Jharkhand-831001, India E-mail: skrout@tce.co.in; mde@tce.co.in; akmandal@tce.co.in; biswajitd@tce.co.in

ABSTRACT: In applications where it is required to enhance stability of vertical cut faces or natural slopes, soil nailing techniques are being increasingly used. The nails improve the ability of soil mass to take care of tensile forces by acting as reinforcement. From reported literature, it is found that such applications have been made mostly in highway projects with favourable soil conditions. The advantages can be extrapolated for applications in mine infrastructure projects and difficult soil conditions with undulated terrain. This paper aims to highlight a unique case on the rehabilitation of a failed slope in lateritic soil mixed with iron ore fragments and stabilization of 33kV transmission tower foundation which is situated just edge of the hill slope. This achieved the desired purpose for stabilization of failed slope and restoration of conveyor operation which is just beneath the hill slope in a shortest possible time. The site specific design aspects along with modified construction methodologies in difficult geological situations have been reported and lessons are learned for future implementation.

Keywords: *soil nailing; grouting; shotcrete; limit equilibrium method; factor of safety*