# IDENTIFICATION OF POTENTIAL UNSTABLE CUT SLOPES AT INTAKE AREA OF TARBELA 4TH EXTENSION HYDRO POWER PROJECT".

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**Abstract**

A rock mass engineering of the geotechnical parameters was Tarbela dam 4th extension hydropower project site area, near Topi village district Haripur KPK which lies in the mountain terrains of lesser Himalayas and consists of mainly three formations namely Abbottabad formation, Hazara formation and Salkhala formation.

Dam play a vital role in water supply, flood control, irrigation, navigation, sedimentation control, and hydropower production. The study was done to determine the stability of rock slopes along the intake area of Tarbela dam for the purposes to prevent any type of slope failure, to prevent any erosion of surface material and to avoid any type of rock mass weathering due to change in climatic conditions. Any kind of slope failure may lead to disruption in vertical shafts of Tunnel T-3 &T-4. This study consists of three parts: field, laboratory and office works. The field work is comprised of Detailed Engineering Geological Mapping of excavated Slopes on the base map with the help of survey machine (i.e., Total Station). Orientation/discontinuity data (dip/ strike/ dip direction) was recorded for all marked zones with the help of Brunton Compass. Geological map prepared in the field was finalized, colored and reproduced in Auto CAD and Detailed Scan line Survey carried out by ISRM Suggested Methods. And also utilizing data of ten bore holes in the intake area. Laboratory test show that the unconfined compressive strength (48mm sample diameter) of dolerite rock average strength 95.55 Mpa, these rock are strong. The unit weight test was also conducted which result show that average unit weight is 90.225. Kinematic analysis and limit equilibrium analysis was carried out by using softwares Rocscience Dips 5.1 for plane failure, Rocscience swedge for wedge failure and Rocscience rocplane for factor of safety to evaluate the rock mass engineering is used to determine the stability of rock slopes. From the results three slope failures namely plane failure in (JS-O1), wedge failure in (JS-01 / JS-02 and JS-02/JS-03) and toppling in (JS-01 and JS-04) were identified and factor of safety were less than one which is potentially unstable slopes.