



Assessment of Slope Stability of Various Cut Slopes with Effects of Weathering by Using Slope Stability Probability Classification (SSPC)

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Rocks containing pore spaces, fractures, joints, bedding planes and faults are prone to weathering due to temperature differences, wetting-drying, chemistry of solutions absorbed, and other physical and chemical agents. Especially cut slopes are very sensitive to weathering activities because of disturbed rock mass and topographical condition by excavation. During and right after an excavation process of a cut slope, weathering and erosion may act on this newly exposed rock material. These acting on the material may degrade and change its properties and the stability of the cut slope in its engineering lifetime.

In this study, the effect of physical and chemical weathering agents on shear strength parameters of the rocks are investigated in order to observe the differences between weathered and unweathered rocks. Also, slope stability assessment of cut slopes affected by these weathering agents which may disturb the parameters like strength, cohesion, internal friction angle, unit weight, water absorption and porosity are studied. In order to compare the condition of the rock materials and analyze the slope stability, the parameters of weathered and fresh rock materials are found with in-situ tests such as Schmidt hammer and laboratory tests like uniaxial compressive strength, point load and direct shear. Moreover, slake durability and methylene blue tests are applied to investigate the response of the rock to weathering and presence of clays in rock materials, respectively. In addition to these studies, both rock strength parameters and any kind of failure mechanism are determined by probabilistic approach with the help of SSPC system. With these observations, the performances of the weathered and fresh zones of the cut slopes are evaluated and 2-D slope stability analysis are modeled with further recommendations for the cut slopes.

Keywords: 2-D Modeling, Rock Strength, Slope Stability, SSPC, Weathering