LAPURAN PROJEK TAHUN AKHIR
KURSUS DIPLOMA LANJUTAN KEJURUTERAAN AWAM
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AN INVESTIGATION OF THE EFFECT OF MOISTURE CONTENT ON THE UNIAXIAL COMPRESSION STRENGTH OF MALAYSIAN ROCK

BY

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SYNOPSIS

The uniaxial compressive strength of rock is determined by loading a cylindrical or prismatic specimen to failure in a compression machine.

The compressive strength is the most common method for determining the rock strength and the procedure used by most laboratories in making this measurement is virtually identical. Theoretically the compressive strength test is deceptively simple, but in practice there are a number of factors which can significantly affect the test results, such as the flatness of the bearing surfaces, the specimen size and shape, the moisture content in the specimen, the effects of friction between the bearing platens and the specimen, the alignment of the swivel head, and the rate of loading .

Most rocks contain moisture between 1% to more than 35% for porous rocks (such as sandstone). In most mines tunnelling and other underground works, the rock is almost saturated which subsequently explains for the leaky tunnels and water seeping through and dripping into the openings of fractures, faults, and joints.

In our investigation, we are going to determine the effect of moisture content on the uniaxial compressive strength of the tested rock specimens. Three common rocks were selected, i.e Granite, Limestone and Sandstone. The rocks specimenswere saturated from 0% to 15% and their compressive strength were determine respectively.

Generally it is found that, the uniaxial compressive strength of these rocks decreasesas the moisture content increases .

CHAPTER ONE

INTRODUCTION

1.0. Uniaxial Compressive Strength.

Uniaxial compressive strength is one of the most important mechanical properties of rocks that is mainly used for the design of structures and characterization of intact rock materials. In rock engineering, the uniaxial compressive strength of rocks is generally defined as the failure strength of an intact rock specimen, having a diameter of 48 or 54mm and a length-to-diameter ratio of at least 2, preferably 2.0 - 3.0 [1]

There are both internal and external factors are defect, mineralogy, grain size, porosity, moisture content in the specimen, degree of weathering or alteration and anisotropy. The external factors are specimen shape and size, type of platen, rate of loading and degree of saturation. During testing, the influence of these factors should be recognized and results should be interpreted accordingly. Otherwise, the test results may be misleading or virtually useless or both.

The uniaxial compression test is performed on cylindrical, or prismatic, or cube rock specimens by compressing or loading them to failure. Upon failure, the rock specimen usually fractures by axial, brittle splitting, or fails in shear, depending upon the degree of the end contraints at the end of the