AIN SHAMS UNIVERSITY
FACULTY OF ENGINEERING
STRUCTURAL ENGINEERING DEPARTMENT

ASSESSMENT OF ROCK FALL PROTECTION MEASURES WITH APPLICATION ON UMM EL-SEED PLATEAU IN SHARM EL-SHEIKH IN EGYPT

Thesis
Submitted in Partial Fulfillment of the
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In
CIVIL ENGINEERING
STRUCTURAL ENGINEERING DEPARTMENT
By

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STATEMENT

This thesis is submitted to Ain Shams University for the degree of M.Sc. in Civil Engineering.

The work included in this thesis was carried out by the author at the Department of Structural Engineering, Faculty of Engineering, Ain Shams University, Cairo, Egypt.

No part of this thesis has been submitted for a degree or a qualification at any other University or Institution.

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ABSTRACT

A potentially unstable rock face may cause a catastrophic disaster, damage to property and loss of life every year across the globe. Slope failure and rock fall one of the major geohazards that can be triggered by earthquakes, volcanic eruptions, heavy rain fall or indeed by human activities.

Umm El Seed plateau is overlooking the Gulf of Aqaba. It is bounded from the west by Sharm El Maya and from the east by Marsa Menaisel. It is about 3.5 km2 in area. The average height of the plateau is 10 to 30 m above sea level and has generally gentle slope about 50 toward the south. Most sides of the plateau have nearly vertical side slope (scarps) facing the seaside. The geological formation mainly consist of a hard reefal Limestone unit is underlying with relatively fine sandstone unit. The plateau is a high-risk area for major rock fall events. The plateau is occupied and surrounded by several tourist resorts and hotels. It has been found that the plateau is affected by tectonic and non-tectonic structures. The tectonic structures are those formed by stresses inside the earth's crust such as folds, faults and joints, which is mainly controlled by the seismicity of the region indicates that the Gulf of Aqaba has been the most active segment of the plate boundary between Arabian and Sinai plates. Since 1983, the Gulf region was affected by four major earthquakes sequences. The largest shock had a magnitude of 5 Richter seismic magnitude scale. It's classified as 5th degree region according to Egyptian code which is the most critical region subjected to earth quack. The non-tectonic structures on the other hand are produced by external or surface process, such as, weathering, erosion and gravity forces which mainly controlled by the effect of deferential erosion (undercut) of the underneath sandstone unit which cause the movement of limestone blocks leading too rock fall. This research will discuss the rock stability and

the execution of appropriate remedial measures often hampered by constraints in data collection and equipment access

Keywords: Jointed rock, Umm El Seed, remedial measures.

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