

**A STUDY ON THE RESPONSE SPECTRAL ACCELERATION DUE
TO EARTHQUAKE OF 26 DECEMBER 2004**

By

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Report is submitted as
the requirement for the degree of

Bachelor Engineering (Hons) (Civil)

**MARA UNIVERSITY OF TECHNOLOGY
MAY 2007**

ACKNOWLEDGEMENT

Assalamualaikum w.b.t...

In the name of Allah S.W.T, the most gracious and most merciful, with His permission, this thesis has been successfully done. Alhamdulillah, I am very thankful to Allah S.W.T for providing me with the strength and patient to complete this thesis.

I would like to dedicate my special compliments and my most sincere gratitude to my supervisor Ir. Dr. Hj. Mohd Farid bin Ahmad @ Majid for his useful ideas and advice. His guidance, patient, encouragement, constructive comments and inspiring enthusiasm were really a great help.

I am grateful to my beloved family for their moral and financial supports and always be there for me.

Special thanks go to Mr. Fadzli, Miss Tuan Juliana, and my close friends especially Tracy Lawrence, Aina Adam and Raymi Arip. Thank you for all the practical information supplied to me in finishing this report. For others who have contributed directly and indirectly to the completion of this research, your help is very much appreciated.

May The Almighty One shower His blessing upon and make this effort useful and beneficial for others for future reference.

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ABSTRACT

Although earthquakes have never caused any structural damage to Peninsula Malaysia, the consequences of even a moderate level of ground motion may be enormous because of the high concentration of population and commercial activities taking place in structures that have not been designed for seismic loads in the area. In order to design the structure to withstand the seismic loading, the initial important soil dynamic terms need to be analyzed. They are including the acceleration, and response spectra of the soil. Earthquake ground motions are usually predicted in two stages. In the first stage, an attenuation relationship is used to relate the earthquake magnitude, depth of epicenter, and location of earthquake source and study areas by using essential relationship based on adjusted relationship that is commonly used for Peninsular Malaysia. Attenuation relationship for Perai due to Sumatran Earthquake on December 2004 was used to determine the Peak Ground Acceleration (PGA) at bedrock. The result then was applied together with the NERA software to determine the Spectrum Response and Peak Surface Acceleration for the soil surface (PSA). Data collection included the search for the earthquake history data, strong ground motion data and soil data from different site location.

CHAPTER 1

INTRODUCTION

1.1 Background

Although the seismic hazard from such distant earthquakes to Peninsular Malaysia, in terms of ground shaking, is considerably low, the seismic risk, in terms of damage potential to structures, loss of lives, assets, businesses and services, cannot be ignored. This is because of the high concentration of population and commercial activities taking place in structures that have not been designed for seismic loads in cities such as Penang and Kuala Lumpur. In line with the increasing public awareness towards seismic loss potential, it is timely to assess the seismic hazard and risk thoroughly. Ground motion relationships in terms of peak ground acceleration (PGA), peak ground velocity (PGV) and response spectral acceleration (RSA), as functions of earthquake magnitude and distance are fundamental inputs to seismic hazard assessment. These functions are called attenuation relationships. Attenuation relationship is a simple mathematical model that relates a ground motion parameter to earthquake source parameter and local site condition

Most of the attenuation relationships were developed for earthquake event which have the epicenter distance of less than 300 km. On the other hand, Peninsular Malaysia is affected seismically by far field earthquake events from Sumatran fault. The nearest distance of earthquake epicenter from Malaysia is approximately 350 km. Hence for this research the more essential relationship