

# **MICROWAVE NONDESTRUCTIVE MEASUREMENT OF CONCRETE USING AN OPEN-ENDED WAVEGUIDE**

**Thesis is presented in partial fulfillment for the award of the  
Bachelor of Electrical Engineering (Honours)  
UNIVERSITI TEKNOLOGI MARA**



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OKT 1999

## ABSTRACT

This project work involves a testing of several samples of composite materials by using microwave nondestructive testing technique. The technique used is an open-ended waveguide technique, which make it possible for the measurement of concrete as a sample. The frequency range is from 8.0 GHz to 12.5 GHz . This testing proposes to measure the complex permittivity of composite materials. The main equipment for testing is *WILTRON 37269B* Vector Network Analyzer. A computer program using Fortran 77 were develops for calculation of complex permittivity. Data measurement from the analyzer is applied to this program to get the result needed.

## **ACKNOWLEDGEMENT**

In name of ALLAH, the most Gracious and the most Merciful.

I wish to express my sincere gratitude and appreciation to my supervisor, Dr Deepak Kumar Ghodgoankar for providing the support and invaluable guidance towards success of this project. All the regular discussion sessions that we had throughout period of study have contributed to the success of this project.

I must also acknowledge the excellent services provided by the Faculty of Civil Engineering. Appreciation is given to all school staff and colleagues in helping in the writing-up of the thesis and also to my family who gives me encourage during my study in the Shah Alam

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