

**UNIVERSITI TEKNOLOGI MARA**

**THE COMPARISON AND ANALYSIS  
THE GROUND PENETRATING  
RADAR (GPR) EQUIPMENTS ON  
ELECTROMAGNETIC RADIATION  
DATA**

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Thesis submitted in fulfillment  
of the requirements for the degree of  
**Surveying Science and Geomatic (Hons)**

**Faculty of Architecture, Planning & Surveying**

**July 2018**

## AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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## **ABSTRACT**

The Ground Penetration Radar (GPR) becomes a popular device in investigation of the underground utilities in recent years. GPR use of electromagnetic radiation to detect and record the properties of underground utility. Besides that, GPR can analyse the type and position of utility objects. However, the performance accuracy of GPR models is an important issue that should be considered. This research conducts between two models of MALA ProEx GPR and Noggin Smart Cart 250MHz GPR by focusing on the basic principle of GPR, accuracy analysis and calibration method implemented on GPR. The survey work has been performed to identify the capabilities of GPR equipments with same frequency which is 250MHz to detect underground utility objects at Gurun, Kedah which required steps of study area preparation, data collection, data processing and interpret the results of data. In this study area were buried the utility objects of PVC pipe and Metal pipe and their original depth were 2.25 metres and 2.10 metres respectively. These surveys were organised on a grid pattern across the surface of land in the test facility. In addition, data analysis was carried out to compare between two models of GPR equipments. This research provide proper guideline and assists surveyors to select the suitable equipments regarding on application especially on utility mapping in terms of accuracy.

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