UNIVERSITI TEKNOLOGI MARA

THE IMPLEMENTATION AND ANALYSIS OF WATER DRAINAGE DETECTION USING GROUND PENETRATING RADAR (GPR) TECHNOLOGY

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Thesis submitted in fulfillment
of the requirements for the degree of
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AUTHOR'S DECLARATION

I declare that the work in this disertation 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

Groundwater is one of the natural resources of drinking water instead of the surface water. Determination of groundwater sources specifically in Malaysia has proven to be incompetent, destructive, time consuming and expensive. Hence this leads the need to adopt a well-established technique for hydrogeophysical prospection such as non-destructive and able to portray the subsurface heterogeneities. In this study, the potential of the Ground Penetrating Radar (GPR) as a non-destructive method to correctly and efficiently detect the groundwater has been examined. GPR has proved to be the most promising and suitable technological solution for efficient determination of groundwater. A control test on groundwater detection has been performed at the Kaki Bukit to Wang Kelian road in Perlis at the area that has occurring a landslide using the MALA ProEx GPR 250 MHz central frequency. Data was taken along 13 profile which are eight for longsectional profile and five for crossectional profile with interval two meter for the crossectional and one meter for the longsectional. Data from GPR detection are processed using the ReflexW software. Result have found that, water level depth was estimated in range from 5.06869m to 5.43311m for longsectional profile and in range from 5.44453m to 5.71105m for crossectional profile. The water flow also been identified in this result which is the water will be flow possibly to the west where there is a slope at that area. To improve the visualization and interpretation of the groundwater, the three dimensional model (3D) has been generated using ReflexW 3D software. The results show that this study ascertained the capability and effectiveness of the GPR is an efficient tool for the investigation of the water drainage.

TABLE OF CONTENT