UNIVERSITI TEKNOLOGI MARA

EVALUATING AND IMPROVING THE ACCURACY OF LOCAL GEOID MODEL IN PERLIS REGION

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of the requirements for the degree of
Surveying Science and Geomatic (Hons)

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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

Geoid is vital information in the determination of orthometric height via GNSS levelling. Based on the ellipsoidal height observed by GNSS, the accurate orthometric height can be easily computed by adding precise and accurate geoid model information. This will particularly enable the users to replace the traditional orthometric height determination techniques to become faster and more cost effective. Currently, in Malaysia is consist two local geoid model that is MyGEOID04 are develop by DSMM using RCR method while PMSGM2014 are successfully establish by (sulaiman,2016) by using Least Square modification of Stokes' approach also known KTH method. The both of the geoid model are has not been technically tested on the accuracy of the northern regions of Malaysia, especially in the state of Perlis. The main purpose of this study is to evaluate the local geoid model in absolute method and relative method by using static GPS observation data on selected BM / SBM. This evaluation is very important to determine the level of accuracy that the model geoid can provide for work that requires the determination of orthometric height using the GPS method. In the evaluation of the geoid model, it is found that the model of KTH Fitted are provide the accuracy of RMSE ±0.0651m by using absolute method whilst model from MyGEOID Gravimetric provides higher precision value close to MSL compared to other models with the value of RMSE ±0.0427m by relative method. The ability of both geoid models to provide geoid value to higher accuracy enables both models to adjust by geoid fitting process using parameters 3, 4 and 7 of the Similarity Transformation Model. As a result of the geoid fitting process, the geoid value has improved to close to MSL. Accuracy that has been generated by the new geoid model fitted and tested using data from MyRTKnet GPS observations prove that the model from KTH_4P and Mygeoid_4P give the accuracy of the RMSE ±0.0451 through absolute method. However, by using relative method model MyGEOID are given accuracy of the RMSE ±0.0479m compare to another geoid model.

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