UNIVERSITI TEKNOLOGI MARA

INTEGRATION OF LAND AND MARINE VERTICAL DATUM

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Thesis submitted in fulfillment of the requirements for the degree of Bachelor of Surveying Science and Geomatics (Hons)

Faculty of Architecture, Planning and Surveying

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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.

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ABSTRACT

Integration of land and marine vertical datum is become important issues nowadays. Many agencies from oversea has conduct project and research to joining land and marine data. Seamless vertical datum is needed to produce high accuracy vertical data to join land and marine data. In order to represent seamless vertical surface, geoid modelling is the alternative way to define the seamless vertical surface. In this study, determination of gravimetric geoid model for Peninsular Malaysia computed using Least Square Modification of Stokes' with Additive Correction (AC). Gravimetric geoid model over Peninsular Malaysia computed from various dataset which include 8241 points of terrestrial gravity data, 370736 points of marine gravity data, 24856 points of gravity data, Global Digital Elevation and three (GOCO01S, GOSG01S, GOCO2s) GGM models. Gravimetric geoid model computed from three GGMs models undergo evaluation and validation with local mean GNSS/Levelling. GOCO01S GGM model represent the best fit for geoid modelling Peninsular Malaysia with standard error 0.063m. The new gravimetric geoid model for Peninsular Malaysia has been developed 1' x 1' arc minute grid interval. In order to integrate land and marine vertical datum, relationship between different vertical is investigate. In order to investigate the relationship, all the vertical datum is positioned and referred to ellipsoid surface. Therefore, GNSS observation has been conducted on Tidal Gauge Benchmark around Peninsular Malaysia tidal station to determine the ellipsoid surface. Separation value from geoid surface to different vertical has been computed which produce various vertical dataset. The separation value applied on geoid surface to joining land and marine data.

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