# UNIVERSITI TEKNOLOGI MARA

# THE EFFECT OF GGM IN LOCAL GEOID DETERMINATION BY USING KTH METHOD

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Thesis submitted in fulfilment of
the requirement for the award of
**Bachelor of Surveying Science and Geomatics**
**(Honours)**
**(AP220)**

**Faculty of Architecture, Planning and Surveying**

**July 2017**

# AUTHOR'S DECLARATION

I declare that the work in this dissertation 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

Johor is characterized as one of the states that urbanized and also has flat terrain in this country's regions. So the existence of the high-resolution geoid model is considered very important with widespread of the GPS technology in the country. In this study, a new gravimetric geoid model is computed for Johor region, by applying the method that was developed by Royal Institute of Technology (KTH) Stockholm-Sweden. The method utilizes the least-squares modification (LSM) of Stokes formula. The modified Stokes formula combines the regional terrestrial gravity data together with the long-wavelength gravity information from a global gravitational model (GGM). The Digital Elevation Model (DEM), SRTM generated by NASA and the National Imagery and Mapping Agency (NIMA) also used to compute topography effects on the geoid. Four additive corrections are computed over the entire target area and applied to the approximate geoid heights obtaining the final geoid solution. The gravimetric geoid is validated by using GPS-levelling information at 62 points distributed over the whole Johor. The results will show that the standard deviation (STD) of the differences between the gravimetric and geometric geoid heights at 62 GPS-levelling points. Smaller standard deviation means the geoid is a good model for Johor region.

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