UNIVERSITI TEKNOLOGI MARA

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

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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

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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.
TABLE OF CONTENT

CONFIRMATION BY PANEL OF EXAMINERS ii
AUTHOR’S DECLARATION iii
SUPERVISOR’S DECLARATION iv
ABSTRACT v
ACKNOWLEDGEMENT vi
TABLE OF CONTENT vii
LIST OF TABLES x
LIST OF FIGURES xi
LIST OF ABBREVIATIONS xiii

CHAPTER ONE INTRODUCTION 14
1.1 Research Background 14
1.2 Problem Statement 17
1.3 Aim and Objectives 19
1.4 Scope of Study 19
   1.4.1 Study Area 19
   1.4.2 Data 20
   1.4.3 Method 20
1.5 Significance of study 20
1.6 General Research Methodology 21
1.7 Structure of Thesis 22

CHAPTER TWO LITERATURE REVIEW 23
2.1 Introduction 23
2.2 Height System Element 23
   2.2.1 Orthometric Height 23
   2.2.2 Geoid Height 24
   2.2.3 Ellipsoidal Height 25
2.3 Height Identification Technique 26
2.3.1 Precise Levelling 26
2.3.2 GNSS Levelling 28
2.4 Height Modernization System in Malaysia 29
2.4.1 Malaysia Geoid Model (MyGEOID) 29
2.4.2 Peninsular Malaysia Geoid Model (PMGM2014) 31
2.4.3 Geoid Fitting 32

CHAPTER THREE RESEARCH METHODOLOGY 34
3.1 Introduction 34
3.2 Data Acquisition 36
  3.2.1 Precise levelling data 36
  3.2.2 The Global Navigation Satellite System (GNSS) Points 37
  3.2.3 CORS Station 38
  3.2.4 Local geoid model 38
3.3 Preliminary Processing 40
  3.3.1 GPS/Levelling Data Processing 40
  3.3.2 Interpolation of the local geoid model 43
  3.3.3 Computation of geometrical geoid value (Ngeo) 44
  3.3.4 Evaluation of the accuracy local geoid model 44
3.4 Data Processing 46
  3.4.1 Geoid Fitting By Using the Similarity Transformation Model (STM) 46
  3.4.2 Verification of the New Fitted Geoid Model 50
3.5 Summary 53

CHAPTER FOUR RESULTS AND ANALYSIS 54
4.1 Introduction 54
4.2 Determination of the Vertical Datum Bias between MyGEOID and PMSGM2014 (KTH) 54
4.3 Accuracy Assessment of the Local Geoid Model Using Absolute Method 56
  4.3.1 Evaluation Root Square Linear (R²) of MyGEOID Gravimetric with KTH Gravimetric and MyGeoid Fitted with KTH Fitted 56
  4.3.2 Evaluation Residual of the Geoid Model 57
4.4 Accuracy Assessment of the Local Geoid Model Using Relative Method 60