

UNIVERSITI TEKNOLOGI MARA

**MODELLING OF PRECISE HYBRID
GEOID IN PERLIS REGION**

MUHAMMAD ‘IZZAT BIN RAMLI

Disertation submitted in fulfillment
of the requirements for the degree of
Bachelor of Surveying Science and Geomatics

Faculty of Architecture, Planning, and Surveying

August 2020

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.

Name of Student : Muhammad 'Izzat Bin Ramli

Student I.D. No. : 2017643054

Programme : Bachelor of Surveying Science and Geomatics

Faculty : Architecture, Planning, and Surveying

Thesis : Modelling of Precise Hybrid Geoid in Perlis Region

Signature of Student : *Muhammad 'Izzat*

Date : August 2020

ABSTRACT

The investigate were about the height come from the geoid surface where called as geoidal height (N), which is in Malaysia have several geoid model where have computed, for example Mygeoid, PMGG2020, and more, where have used by the surveyor in every state in Malaysia especially in study area Perlis region. However, height in Malaysia have refer to the Mean Sea Level (MSL) where refer to the Port Kelang, called as Orthometric Height (H). So that, the modelling of precise hybrid geoid in Perlis region using geometric geoid from Global Navigation Satellite System (GNSS) observation will be perform ensure the height getting from GNSS can be concise with MSL in Malaysia. So that, to get the good modelling of precise hybrid model in Perlis region, the three gravimetric have tested and get the RMSE for the accuracy for every type of gravimetric geoid. After that, the good geoid will be selected and integrate with land levelling datum using the best parameter and method. So that, from the RMSE calculation, the good gravimetric geoid have founded, back up by the quadratic calculation and get the best and good gravimetric model for Perlis region was PMGG2020 with 0.1023m. After that, that gravimetric proceed with integrate. In conclusion, this study have produce the hybrid geoid model where will helped the surveyor in Perlis region to get the good geoid value to calculate the value of H for practitioners.

TABLE OF CONTENT

CONFIRMATION BY PANEL OF EXAMINERS	i
AUTHOR'S DECLARATION	ii
ABSTRACT	iii
ACKNOWLEDGEMENT	iv
TABLE OF CONTENT	v
LIST OF TABLES	viii
LIST OF FIGURES	ix
LIST OF ABBREVIATIONS	x
CHAPTER ONE: INTRODUCTION	
1.1 Research Background	1
1.2 Problem Statement	2
1.3 Aim and Objectives	3
1.4 Research Questions	3
1.5 Study Area	4
1.6 Available Data	5
1.6.1 GNSS Data	5
1.6.2 Gravimetric Geoid	8
1.7 Software	11
1.7.1 Trimble Business Centre (TBC) v5.0	11

3.6.2 GNSS Observation Technique	29
3.6.3 Data Processing	30
3.7 Software Used	34
3.7.1 Trimble Business Centre (TBC) v5.0	34
3.7.2 Microsoft Excel	35
CHAPTER FOUR: RESULT AND ANALYSIS	
4.1 Introduction	36
4.2 GNSS Calibration	36
4.2.1 EDM Baseline Test	36
4.3 Result of GNSS Post-Processing	37
4.4 Results of Analyse Accuracy of Local Geoid Models	39
4.5 Accuracy Assessment Using Quadratic Method in MATHLAB Software.	40
4.6 Integrate Gravimetric Geoid Model With Local Geodetic Datum (LVD) in Perlis Region	41
4.6.1 Hybrid Geoid Model Using Gravsoft Software	41
4.7 Comparison Between MyGeoid and Hybrid Geoid Model	46
CHAPTER FIVE: CONCLUSION AND RECOMMENDATION	
5.1 Introduction	48
5.2 Conclusion	49
5.3 Recommendation	50
REFERENCE	51
APPENDICES	53