UNIVERSITI TEKNOLOGI MARA

UNDERGROUND UTILITY DATA MANAGEMENT USING GEOGRAPHIC INFORMATION SYSTEM

NURUL SYHAHIRA BINTI ALIAS

Thesis submitted in fulfillment of the requirements for the degree of Bachelor Science of Geomatics

Faculty of Architecture, Planning and Surveying

January 2018
AUTHOR’S DECLARATION

I declare that the work on this project / dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA. The project / dissertation are original and it is the result of my own work, unless otherwise indicated or acknowledge as referenced work.

In the event that my project / dissertation be found to violate the conditions mentioned above, I voluntary waive the right of conferment of my Degree of Bachelor in Surveying Science and Geomatics (Honours) and agree to be subjected to the disciplinary rules and regulations of Universiti Teknologi MARA.

Name of Student : Nurul Syhahira binti Alias
Student’s ID No. : 2014244652
Faculty : Faculty of Architecture, Planning and Surveying
Programme : Bachelor in Surveying Science and Geomatics (Honours)
Code Programme : AP220
Project Title : Underground Utility Data Management using GIS
Signature and Date :

Approved by:

I certify that I have examined the student’s work and found that they are in accordance with the rules and regulations of the Department and University and fulfills the requirements for the award of the Degree of Bachelor in Surveying Science and Geomatics (Honours).

Name of Supervisor : Pn.Siti Maryam binti Abdul Wahab
Signature :
Date : January 2018
ABSTRACT

Department of Surveying and Mapping (JUPEM) is the responsible authority in maintaining a repository of underground utility data from various utility agencies. Orderly management of utility data between JUPEM and utility agencies requires the establishment of agreed mechanisms, procedures and specifications, then Standard Guideline for Underground Utility Mapping were created and embark the creation and maintenance of National Underground Utility Database called PADU. PADU is the main component of the utility mapping system in JUPEM. It is a seamless database consisting of four major components which is 1:500 base maps, cadastral data, utility data and imageries in order to produce a complete utility mapping. This study will help to improve the creating of the utility mapping which is easy to be update in the PADU system. However, this guideline had not been properly followed by the utility agencies. Therefore, the purposed of this study is to identify the adherence of utility data provided by the related agencies as compared to the standard existing guideline and framework. Underground utility data from Syarikat Air Darul Aman (SADA) is taken as a sample study case for this research which located in Taman Arked, Sungai Petani, Kedah. In order to identify that, the studies of the existing framework help to better understand the concept of the framework. In conclusion, this research proposed a sample of framework database for underground utility that can be easily followed by the entire utility provider. Then, the benefit from this research is the framework that has been provided by the responsible authority must be follow by all the various agencies as that will help JUPEM in order to centralize the database between the agencies.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>TITLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TITLE PAGE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONFIRMATION BY PANEL</td>
<td>ii</td>
<td></td>
</tr>
<tr>
<td>AUTHOR’S DECLARATION</td>
<td>iii</td>
<td></td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>iv</td>
<td></td>
</tr>
<tr>
<td>ACKNOWLEDGEMENT</td>
<td>v</td>
<td></td>
</tr>
<tr>
<td>TABLE OF CONTENTS</td>
<td>vi</td>
<td></td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>ix</td>
<td></td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>x</td>
<td></td>
</tr>
</tbody>
</table>

1 INTRODUCTION

1.0 Introduction  1
1.1 Background  1
1.2 Research Gap  2
1.3 Problem Statement  5
1.4 Aim  7
1.5 Objectives  7
1.6 Research Questions  7
1.7 Proposed Methodology  8
1.8 Study Area  10
1.9 Data Collection  11
1.10 Significant of Study  11
1.11 Conclusion  12
4 RESULT AND ANALYSIS

4.0 Introduction 27
4.1 Verification of Standard Guideline 27
  4.1.1 Implementation of JUPEM guideline 27
  4.1.2 Implementation of SADA 28
  4.1.3 Implementation of Equarater Company 30
  4.1.4 Implementation of TNB 32
4.2 Percentage of compliance 35
  4.2.1 Percentage of SADA 35
  4.2.2 Percentage of Equarater Company 35
  4.2.3 Percentage of TNB 36
4.4 Conclusion 37

5 CONCLUSION

5.0 Introduction 38
5.1 Conclusion 38
  5.1.1 First objective 38
  5.1.2 Second objective 39
5.2 Recommendation 49

REFERENCES 40
APPENDIX 42