

**UNIVERSITI TEKNOLOGI MARA**

**AS-BUILT INSPECTION FOR CONCRETE TANK  
USING NON-CONTACT THREE DIMENSIONAL  
DATA ACQUISITION**

**NURUL HUDA BINTI ABD RAHMAN**

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

**Faculty of Architecture, Planning and Surveying**

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## AUTHOR'S DECLARATION

I declare that the work in this thesis/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 Under Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

Name of Student : Nurul Huda Binti Abd Rahman  
Student I.D. No. : 2013564813  
Programmer : Bachelor of Survey Science and Geomatics  
(Honours) – AP220  
Faculty : Architecture, Planning & Surveying  
Thesis/Dissertation Title : As-Built Inspection For Concrete Tank Using Non-Contact 3D Data Acquisition

Signature of Student :  .....

Date : July 2017

### Approved by :

I certify that I have examined the student's work and found that they are in accordance with the rule and regulations of the Department and University and fulfils the requirement for the award of the degree of Bachelor of Surveying Science and Geomatics (Honours).

Name of Supervisor : Sr. Dr Mohd Azwan Bin Abbas

Signature and date

 11.08.17.

## ABSTRACT

Three dimensional laser scanner is a powerful data collection system that provides 3D information for a specific area of interest. It is the predominate technology for terrestrial survey, construction and as-built analysis. TLS commonly produce centimeter spatial and range accuracy at several hundred meter range. Due to tank inspection that require accurate data, TLS is able to provide high accuracy data for tank inspection requirement. Several approaches tank inspection method has been done by previous research. It has shows have limitation in data acquisition, data processing and data analysis. Therefore, the aim of this study is to investigate the suitability of TLS measurement technique in concrete tank inspection. In order to achieve the objective, some analysis has been done through the methodology by perform dimensional analysis and point to point analysis. There are 42 artificial targets distributed of concrete tank are used in this analysis to examine data quality of TLS in concrete tank inspection by total station data as benchmarking. Second analysis is to investigate the reliability of TLS data to perform surface inspection by create surface deviation model to detect defect surface on concrete tank. The result was evaluated by standard deviation, RMS residuals and surface deviation model. The result has shows TLS data can be used on concrete tank inspection.

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