UNIVERSITI TEKNOLOGI MARA

MONITORING OF BUILDING STRUCTURAL DEFORMATION USING GLOBAL POSITIONING SYSTEM, TERRESTRIAL SURVEYING TECHNIQUE AND CRACK GAUGE MEASUREMENT

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Thesis submitted in fulfillment of the requirements
for the degree of
Master of Science

Faculty of Architecture, Planning & Surveying

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Candidate'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 result of my own work, unless otherwise indicated or acknowledged as referenced work. This topic has not been submitted to any other academic institution or non-academic institution for any other degree or qualification.

In the event that my thesis be found to violate the conditions mentioned above, I voluntarily waive the right of conferment of my degree and agreed be subjected to the disciplinary rules and regulations of Universiti Teknologi MARA.

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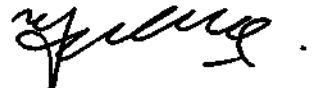
Signature of Candidate	
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ABSTRACT

Deformation of engineering structures is often monitored in order to ensure that the structure is exhibiting a safe deformation behavior. The deformation of high-rise building can be monitored using geodetic surveys and geotechnical/structural measurements. Geodetic surveys include conventional (terrestrial) and satellite (Global Positioning System); wherelse geotechnical/structural measurements are detected either by using leasers, tiltmeters, joint-meters or micrometers. This research discusses the capability of monitoring high and low-rise building structure using geodetic surveys (conventional and satellite) and geotechnical measurement (crack width measurement). Two buildings namely the Twin Tower and Innovation Centre Building of University Technology MARA (UiTM), Selangor, Malaysia were chosen for this research. Five control stations have been established around the UiTM Twin Tower Building for the purpose of monitoring and another nine points for the Innovation Centre Building. The monitoring exercises were carried out at four (4) different epochs. The Terrestrial and Global Positioning System (GPS) dataset in the monitoring exercise were processed and analysed using the Trimble Geodetic Office (TGO) survey software. Generally the monitored points for the Twin Tower Building experienced movements within 1 mm to 10 mm. For the Innovation Centre Building monitored points seemed to shift between 1 mm to 9 mm. Detection of movement for both building structures seemed to be within the allowable tolerance. It is shown that monitoring of building structures using the techniques adopted in this study has significant advantages and disadvantages.

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