UNIVERSITI TEKNOLOGI MARA

RELIABILITY STUDY OF CADASTRAL REFERENCE MARK ESTABLISHMENT IN SUSTAINING THE ACCURACY OF CADASTRAL RECORD

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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 Postgraduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

E-Kadaster was introduced in 2006 to implement National Digital Cadastral Database (NDCDB), Global Navigation Satellite Systems (GNSS), and Least Square Adjustment (LSA). GNSS technology is widely used in Malaysia's cadastral work to establish Cadastral Reference Marks (CRM) which is not only a cadastral network constraint but also has been utilized for cadastral block adjustment referred to GDM2000 local coordinate system. According to the circular of Cadastral Survey Regulation (*Pekelilling KPUP*) 5/2009, there are four approaches to establish CRMs that utilized static, MyRTKNET, and Real-Time Kinematic (RTK) techniques. However, GNSS observe that using permanent reference stations to get VRS correction has a distance limitation that affected the accuracy of cadastral data. Besides, the RTK technique also has a distance limitation between the base and the rover that could produce poor coordinate precision. Despite of these difficulties, precise GNSS positioning is very crucial in order to improve the accuracy of the region's digital cadastral database (DCDB). Therefore, in order to resolve this issue, this study was performed to investigate the reliability of the CRMs establishment approach in preserving positional accuracy in the National Digital Cadastral Database (NDCDB). In order to quantify the trustworthiness of CRMs measurement approaches as stated in DSMM 5/2009 for cadastral network adjustment, the data acquired from the CRMs measurement with and without constraint to CCN was compared to analyze the accuracy of each method approach in the DSMM circular. Towards improving database accuracy, a high-accuracy master control point namely Cadastral Control Network (CCN) was suggested to improve the accuracy of CRMs. As a result, the precise control network using GNSS observation was achieved to preserve positional accuracy. In a conclusion, this study is able to assist the Department of Survey and Mapping Malaysia (DSMM) to improve the current approaches and techniques stated in circular regulations.

Keywords: E-Kadaster, Global Navigation Satellite Systems (GNSS), Least Square Adjustment (LSA), Cadastral Reference Marks (CRM).

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