UNIVERSITI TEKNOLOGI MARA

CADASTRAL SURVEY PRACTICE ON PARCELS IN A MULTILAYERED SITUATION FOR FUTURE MALAYSIAN 3D CADASTRE

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AUTHOR'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 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.

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ABSTRACT

The current Cadastre system that is being practiced in Malaysia for a period of one hundred years is a two-dimensional (2D) parcel based system. However in the near future, it is envisaged that this 2D based concept may no longer be able to meet the changes brought about by the booming yet complex high density developments. It clearly proves that there are some restrictions to facilitate essential information about land and property, which includes Rights, Restrictions and Responsibilities in 3-Dimensional geographical space. The aim of the thesis focuses on how to introduce and incorporate a 3-Dimensional concept into the current cadastral survey practice for future Malaysian 3D Cadastral with emphasis on the case of multi-layered situations. The thesis begins by firstly introducing the initiatives and implementation strategies on the possibility of the current practice in 3D Cadastre abroad which includes Norway, Queensland (Australia), Israel and Netherlands being accommodated into the existing Malaysian Cadastre System in order to establish a conceptual framework and practice for future 3D Malaysian Cadastre system. Hence, the status and development of the cadastral system and practices elsewhere and their impact on the current practices towards 3D cadastre system in Malaysia and the development of 3D Cadastre abroad are reviewed and documented. In the second objective, the establishment of possible cadastral solutions focusing on the Malaysian cadastral surveying practices are proposed and discussed in enabling the 3D registration of Rights, Responsibilities and Restrictions (3D-RRR_S) for multi-layered parcels development. These proposed solutions comprise of four conceptual approaches to be considered accordingly for the case of multi-layered parcels. Finally, the verification survey through distribution of questionnaires survey in terms of quantitative approach has been conducted in order to validate the capability and feasibility of those suggested solutions for accommodating the 3D Cadastre system in Malaysia. The questionnaires survey from various government authorities and professional firms were analysed statistically in obtaining the perceptions of personnel in collective form on the proposed cadastral solutions. Throughout the result of questionnaire survey is become clear that 86% of respondents were agreed and thought that the introduction of 3-Dimensional based concept as proposed in the thesis will play a significant role in establishing the legal status of multi-layered property rights which offers best potentials and is realizable in the near feature.

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CHAPTER ONE
INTRODUCTION

1.1 RESEARCH BACKGROUND

In today's era of globalization, rapid development of developing countries is driven by population growth, expanding economy, rising standard of living and more land spaces to live in. Malaysia too is not an exception, as due to that rapid development, vacant land is becoming scarce. Department of Statistics Malaysia reported that Malaysia's population in year 2016 is estimated to be 31.7 million, almost tripled the number of population estimated since the time Malaysia was officially formed in 1963 (Department of Statistics Malaysia, 2016). Meanwhile, with the increasing number of population growth, the demand of land use has expanded vigorously into space below and above ground surface primarily in urban central areas, whereby relevant authorities built and converted these spaces preferably as residential places due to suppressing demand of employment and commercial opportunities. As a result, there are different types of spatial parcel use in different layers (or levels) occupied and owned by multi-owners in which each and every owner is tied to one common vertical structural framework forming a situation of multi-layered parcels. This case of multi-layered situation tend to optimize the limited space available and at the same time, set aside the surface on the ground parcel for other land use activities (Choon, Hussin, and Oon, 2009). As can be seen particularly in urban city areas, there are substantial number of extreme modern structures (e.g. high-rise buildings, fly-over, LRT tunnel) were built and positioned in multi-layered situation below and above the ground surface or crossed other parcels boundary.

Under the present 2-Dimensional Cadastre based system, the multiple uses of vertical spaces involving the multi-layered situation are facing a dilemma in terms of registration and survey practice especially in facilitating the legal status of cadastral objects in 3D space effectively (Paulsson, 2008). It should be realized that in the near future, the legal status of cadastral object would no longer be dealing to just the land surface parcel only, which is defined in terms of length and breadth, but it will also relate to a vertical space produced upwards and downwards in spaces above and