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Journal Objectives

International Surveying Research Journal (ISrJ) is an international journal dedicated to the publication of theoretical and empirical refereed articles, case studies or critical literature surveys in the field of surveying research and policy. The scope of the journal is international in two aspects: it presents to a worldwide readership a view of the surveying practices of particular countries, and it encourages

knowledge sharing among researchers, policy makers and practitioners.

The purpose of the **International Surveying Research Journal (ISrJ)** serves to provide a forum for discussion and research to keep abreast of the new technologies developments and to stimulate research in the various surveying disciplines.

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Disclaimer

Editorial

New research directions are arising at the boundaries and interfaces between surveying disciplines. This new journal provides the much needed vehicle for rigorous, peer-reviewed communication for the growing surveying community that strives to bridge these boundaries and create novel scholarship at the confluence of disciplines.

As a journal dedicated to surveying research, the journal aims to provide a platform for the publication of research from various disciplines of surveying. It is hope that this journal will provide an international outlook and become an essential part of the intellectual foundation for the growing international research community.

I hope this first issue of *International Surveying Research Journal* (ISrJ) is the springboard for further research and exploration of various surveying issues in the profession and industry. This journal will provide a forum for the rigorous exchange of ideas and seek an editorial balance that blends concepts and empirical observations to advance both the theory and practice of the surveying disciplines.

Associate Professor Sr Dr. Ting Kien Hwa

Editor

Editorial Board



ARTICLE

New Cadastral System Approach for Planning Sustainability in Malaysia

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ABSTRACT

This paper present solution for reformulate, further improve and enhance the usefulness of the existing cadastral system and title registration of multi-layer properties in order to facilitate a modern Malaysian Cadastral and Land Administration Systems.

A conclusion from the first International Workshop on 3D cadastres in Delft was that the concept of property mainly depends on the national legal system, where each such system has its own instruments for multiple use of land (Registration of Properties in Strata, 2002). A common definition thus does not seem to exist. Each researchers dealing with this term choose their own stipulated definition or description. The introduction of the concept of 3D property establishes a strong link between the real world and legal cadastral entities. With 3D property, which differs from on surface properties where there must be no gaps or overlaps in their boundaries, 3D property can be located above or below one another.

In this paper, we are looking into the field 3D property and it rights as well as the categorisation of 3D property issues relating to rights. Besides that, we also give an introduction into 3D cadastre, the importance of 3D cadastre and the practical solution.

Later, we present the 3D property type in Malaysia with an explanation on the land legislation framework, cadastral survey and registration in Malaysia. This paper discusses literature on good governance, e-government and intergovernmental coordination. Furthermore, this paper also includes discussions on the ways towards 3D property formation and the criteria associated with the establishment of Malaysian 3D cadastre for 3D property rights and the ways to achieve its implementation.

Keywords: land administration, 3D, legislation, cadastre, property

1. INTRODUCTION

The main purpose of this research was to try to come to the generalised concept of 3D property rights and to suggest the possibilities of the implementation of this concept into current cadastral and land law practice in Malaysia as well as to identify possible problems emerging in this connection and to suggest ways to solve them. In this respect, many legal, technical and organisational matters should be investigated. This study is forced on the

legal issues, nevertheless, the overview of technical and organisational issues is provided for the comprehensive understanding of the problem in question.

In order to achieve the purpose of the study, a number of issues have been considered. First, the international experience of the development of the new legislation regarding 3D property formation or alteration of the existing legislation was investigated. Secondly, the analysis has been carried out of the main problems associated with 3D property formation and the ways of solving them have been explored. The analysis was based, largely, on the Swedish experiences.

Next, the ways to represent 3D property in the register have been investigated. The most important task here is to represent the vertical dimension in a clear and unambiguous way. It can be done by specifying upper and lower boundaries of the property rights, creating, in the way of layers of property rights. The limitation with this approach is that these layers can often be determined only for the objects whose horizontal projection is within the boundaries of the ordinary parcel.

2. 3D PROPERTY

Before discuss on what 3D property is, it is important to generally know what real property or property is about. It is difficult to determine what is really real property or property (Mattsson, 2003a) because it is not a homogenous and standardised term, and different authors present different definitions (Paasch, 2004).

When discussing what 3D property rights are, it is necessary to define firstly what 3D property is. As mentioned by Paulsson in her doctorate thesis about 3D property rights:

It is not always easy to understand what is really meant by 3D property, as the concept has no simple meaning. There is no clear and unambiguous definition of this concept, especially since its forms vary in different countries and respective legislation, each having its own definition.

(Paulsson, 2007: 25)

It is worth to mention that issues of three-dimensional determination of property rights are becoming more and more important. 3D properties are not something new but they are like other conventional properties. They can be transferred, mortgaged, expropriated, inherited and can be created by cadastral procedures as a subdivision, partition and amalgamation. In my opinion, 3D properties are an extension of the concept of conventional properties, which possess all of the features pertaining to conventional properties, and can be integrated in the same legal framework as conventional properties. However, 3D properties have more advanced features where they are volumes, parts of spaces, while conventional properties are areas and parts of the earth's surface. 3D properties can occupy different parts of space. They can be subdivided into strata that create separate parcels above or under the original surface parcels.

In the most general sense, a 3D property can be defined as a property delimited both horizontally and vertically in length, width, height and depth, and sometimes can be defined as three-dimensionally determined property. Another definition that is more or less neutral and can be used in most countries is that, a 3D property is a volume that is delimited in length, width, height and depth. The latter definition is even more suitable as it reflects the physical nature of 3D property.

2.1 3D Property Rights

The concept, definition and term of 3D property rights vary in different countries and legislation, each with their own definition. The concept of 3D property rights depends on the

national legal system (Stoter, 2002). According to Paulsson (2007), in order to give a more exact definition of a 3D property rights, it is therefore necessary to look at the legislations of different countries that have the possibility of 3D property rights formation.

There are two main types of 3D property rights can be identified when studying this concept. Firstly, independent 3D property type, also known as public 3D property type is a model of a sharing nature, intervening in the parties' ability to share their property units as they wish, and imposing a certain framework on them, having an inevitable measure of co-ownership.

Secondly, a condominium type, also known as common type, which is a form of 3D property rights, is defined by the United Nations Economic Commission for Europe (2002) as a part of common law jurisdictions that constitutes a special form of ownership giving the proprietor an absolute title to the property. This type of ownership is just one common way for people to own properties containing a number of flats or unit.

2.2 Classification of 3D Property Rights

There are different classifications on owning a building or a piece of land in three-dimensional delimited. Three-dimensional delimited properties can be classified into four types. They are public rights, common rights, management rights and private rights.

There are three types of 3D property under public rights, namely air space 3D property, 3D property on the ground surface and subsurface 3D property. The splitting of land into independent public rights is used in some deed recordation system prevails countries to divide ownership three-dimensionally (Sandberg, 2001). Sometimes, it is called air rights or air space rights. In brief, the air space 3D property is not bound to a specific building or construction. In some legislation, it may contain only a space volume (Paulsson, 2007). One the other hand, the 3D property on the ground surface may only be created within a building or construction, the property will cease if the property is damaged.

The other type that is broadly used for 3D property is the use of common rights. Common terms for this type of 3D property rights for condominium ownership is strata title, this type of ownership comprising individual ownership of dwellings in one building. It is derived from the common law (Reshetyuk, 2004) but is used in both civil law and common law countries, and is called strata title in countries with title registration systems, which are mostly common law countries (Mytrofanova, 2002). Further, strata titles in most countries are used for residential purposes, but in some countries, such as Malaysia, they can also be used for commercial and industrial purposes.

Another way to gain private ownership of an apartment without owning it as property is through management rights. The characteristic of this management rights is that the formal owner holds the private rights of occupancy to condominium and stands between the resident and the property by proprietary leases, gives the rights to use it with shared expenses (Lilleholt et al., 2002 and Merwe, 1994). Finally, three-dimensional use of land is also probable through private rights, such as freehold, leasehold and easement. It is often used for underground transportation or piping purposes.

3. 3D CADASTRE

The multiple use of land is increasing. A person owing a parcel of land also possesses the rights to the column of air above and the column of soil under that land. At ground level the multiple use of land has resulted in the multiple exercises of rights of use and use of the regions above and below ground level in the division of rights in the ownership column (Barnasconi, 2006).

Basically, the purpose of 3D cadastre objects modelling as proposed by Stoter (2004) is to provide boundary certainty of 3D cadastre objects particularly regarding 3D strata and stratum objects of ownership. As stated by Stoter in the need of a 3D cadastre:

Pressure on land in urban areas and especially their business centers has led to overlapping and interlocking constructions Even when the creation of property rights to match these developments is available within existing legislation, describing and depicting them in the cadastral registration, process a challenge The challenge is how to register overlapping and interlocking construction when projected on the surface in a cadastral registration that register information on 2D parcels. Although property has been located on top of each other for many years, it is only recently that the question has been raised on to whether cadastral registration should be extended into the third dimension....

(Stoter, 2004: 3)

3.1 The Importance of 3D Cadastre

Current cadastre registration systems, bound on ground surface's topological and geometrically described parcels, have shown limitations in providing insight in three-dimensional location of three-dimensional constructions (for instance pipelines, tunnels, building complexes) and in the vertical dimension (depth and height) of right established for three-dimensional constructions (Stoter and Ploeger, 2002; Stoter and Ploeger, 2003; and Stoter and Van Oosterom, 2006). In addition, cadastre should be able to describe the overall property ownership especially in Strata Title ownership.

A 3D cadastre is defined as a cadastre that registers and gives insight into rights and restrictions not only on parcels, but also on 3D property units (Stoter, 2004). Thus, such conditions, for example overlapped buildings and utilities that prohibited property to be registered according to legal and organisational aspects using 2D cadastre could be handled by 3D cadastre.

In the near future, a cadastre will form complete methodical, comprehensive and updated documentation of public and private rights, ownership, land use and real estate in various spaces. Concurrently, Benhanu and Doytsher (2001) and Benhanu and Doytsher (2003) illustrated that the 3D boundaries and parcels in space will be determined by 3D cadastre and serves the legal and physical objectives. Therefore, a modern cadastre system should always reflect the existing situation of all property rights, including mixture of private and public properties. Moreover, this provides a better-rationalised management of the built environment, including regulations of legality of use or of economic application (Dimopoulou, Gavanas and Zuntelis, 2006).

3.2 Practical Solution

The vast development today makes an essential increasing demand for three-dimensional situations to support the volume parcels in real property objects. Therefore, one of the three fundamental concepts proposed by Stoter (2004) can be used to cater and solve those problems, which have occurred with some minor modification in order to suit with the cadastral survey, mapping registration system and land registration system for each respective country. Three fundamental concepts with several options are as follows:

- (a) Full 3D cadastre
- (b) 2D/3D hybrid cadastre
- (c) 2D cadastre with 3D tags linked to parcels in current cadastral registration.

4. 3D PROPERTY TYPE IN MALAYSIA

4.1 Malaysian Cadastral System

Peninsular Malaysia is a federation of states, each of which is responsible for its own land matters. All States operate a Torrens system of registration, administered by the State Land Offices and coordinated by the Department of Land and Mines. On the other hand, cadastral surveys are controlled by the Department of Survey and Mapping Malaysia that is a federal department. Department of Survey and Mapping Malaysia is responsible for cadastral survey work within Peninsular Malaysia but is supported by a growing number of licensed land surveyors, who are primarily responsible for engineering and subdivision surveys. Notwithstanding the above, the cadastre in the states of Sabah and Sarawak are administered by the Department of Land and Surveys. They have the ideal set up of having land administration and cadastral surveys under the control of a single organisation, which is a state entity.

The objectives of the Malaysian Cadastral System are to provide security and simplicity to all dealings with land. It establishes and certifies, under the authority of the government, the ownership of an indefeasible title to land and simplifies, hastens and reduces the costs of all land dealings. The title is a conclusive proof that the person mentioned therein is the owner of the land described therein. Valid titles require an accurate description of boundaries and as such, cadastral survey plays an important role in the system.

4.2 Malaysian Land Administration

Malaysian Land Administration is traditionally based on Malaysian land law while cadastral system in Malaysia consists of land registration system and cadastral survey and mapping registration system that have different structures and authorisations. The land registration is a state government juridical while cadastral survey and mapping is under federal jurisdiction. It provides a variety of rights depending on the traditions of the country, but the legalistic cadastral system and land law are still using plane geometric expression for land and property tenure. They have not been prepared to register in three-dimensional situations.

Land use rights are one of the rights that are often based on occupation of land over a long period and can be defined in written law or by traditions (Tan, Khadijah and Ernest Khoo, 2009b). Hence, a systematic record of lands in all matter is very important in the land administration, planning and development of land. This means that, due to the ever increasing demand for ground space, the traditional paradigm in law should be changed (Nordin, 2001). In brief, land administration in Malaysia is generally responsible for the collection of revenue, title registration, managing application for land dealings, changing of condition of land use, subdivision, partition or amalgamation of land or building and so on.

4.3 Land in Malaysian Legislation

In the Malaysian land registration, the process of recording rights in land is via registration of title of land. "Land is a state matters", according to Federal Constitution 1957, land matters is under the jurisdiction of state government, handled by the respective state Registry or District Land Office, depending on where the document of title was formerly registered.

Land Ownership as governed by the National Land Code 1965 (Act 56) is based on the Torrens System (see previous sections). It is protected by the National Land Code 1965 (Act 56) in Section 340 (Registration to confer indefeasible title or interest, except in certain circumstances) and is guaranteed by the Federal Constitution 1957 as stated under Article 13 (rights to property). Once an ownership is being registered, the owner's title and interest is indefeasible except when it involved fraud or misrepresentation. Furthermore,

nobody shall be deprived of property unless he or she had been paid an adequate compensation.

Meanwhile, there are three ways to acquire land. Firstly, the land can be acquired through alienation from the state authority under Section 42 and Sections 76 to 78, National Land Code 1965 (Act 56), secondly is by dealings and finally through inheritance. State agencies and the Federal Government are required to go through State Authority to acquire land in accordance with the Land Acquisition Act 1960 (Act 486) (Land Acquisition Act, 1960).

4.4 Cadastral Survey and Registration in Malaysia

All cadastral survey and registration are performed at the request of the Land Office on the issue of request for survey. The work of the Land Office is concerned with registration of title and with land alienation, either for individuals, government agencies, companies or groups. Meanwhile, the Federal Department of Director General of Lands and Mines (JKPTG) has a purely advisory role in State land matters staffed by servant administrators.

The objectives of cadastral survey are primarily concerned with the determination of definition of property boundaries, locations and areas, through their marking and description on the ground and plans or maps respectively, for the purposes of alienation, subdivision, partition, amalgamation and conveyancing. The system as practised is one of fixed and defined boundary whereby parcel definition is by the officially emplaced and mathematically coordinated boundary marks (Nordin, 2001).

The existing Malaysian cadastral survey and mapping registration system and land registration system, deals with properties not only located on the surface level, but above the surface level and also below the surface level. Therefore, the rights of the proprietor of the surface parcel shall also apply to the proprietor of the above that is air space and underground land as well (Tan, Khadijah and Ernest Khoo, 2010).

The current Malaysian cadastral registration system does not include three-dimensional objects registration rights. This type of cadastral system has been practiced in Malaysia for a period of one hundred years and it provides essential information about land and property like ownerships of the lots and land parcels for the country. In addition, Cadastral Database Management System (CDMS) and Computerised Land Registration System (CLRS), which worked separately in each organisation with different legal aspect, are still in plane surface nature. Consequently, there are no three-dimensional property rights as well as 3D cadastral rights. However, these two systems later on can be incorporated in the registration form with the present advanced and modern technologies such as Geographical Information System, internet, web based and e-commerce applications.

4.5 Integration of Cadastral Database Management System and Computerised Land Registration System

There could be extensive benefits if Computerised Land Registration System (CLRS) of State Land and Mines Office and District Land Office and Cadastral Database Management System (CDMS) of Department of Survey and Mapping Malaysia, are linked together (Tan and Khadijah, 2010b). Therefore, with the integration of attribute data from CLRS and spatial data from CDMS and through identified applications, efficiency of land administration can be greatly improved. Nordin (2001) stated that the envisaged applications include on-line registration for survey and preparation of title, extending Digital Cadastral Database enquiry module to the land administrators and on the other hand, linking the Qualified Title information to the Digital Cadastral Database. Although conceptually tenable, the eventual implementation would need substantial negotiation and compromise among State Land and Mines Office (PTG) and District Land Office (PTD) and Department of Survey and

Mapping Malaysia (DSMM).

With the vast change in the Information and Communication Technologies (ICT), such as Geographical Information System, internet and web-based application and together with the initiative of Malaysian Geospatial Data Infrastructure (MyGDI) National Spatial Data Infrastructure (NSDI), e-Land of Ministry of Natural Resources and Environment (NRE) and e-Cadastre of DSMM, CLRS and CDMS database could be integrated electronically. In order to achieve the goal of comprehensive Land Information System from district level up to state level and eventually at the national level, the integration of spatial CDMS database with the textual CLRS database play a preliminary requirement of all these (Tan and Khadijah, 2010a). Moreover, Mariappan (2005) introduced a mechanism to integrate these two standalone databases. He suggested that coordination among these authorities can be provided by the installation of centralised server or distributed server at each of their office that act as the transporters and bridges in exchanging data between CLRS and CDMS.

4.6 Limitation in Malaysian Land Legislation

The increasing number of land management professionals & licensed land surveyors meant that current land registration and cadastral systems are insufficient for the booming of complex high-density developments in urban areas. So, in big cities, there is growing interest and demand in using space above or below the ground surface for construction of real estate objects (Hassan, 2008; Hassan, Abdul Rahman and Stoter, 2006; Chong, 2006 and Ossko, 2005). However, the legal changes in the land registries did not follow the growing demand and there are still constrains, difficulties to register the ownership of properties which is created above or on the underground surface. Therefore, there is a need of registration of stratified property on the legal status of properties, so that, to be able to define and manage the juridical situation accordingly, three-dimensional information are becoming necessary for land administration in this country.

In land registry, there are difficulties to register the ownership and other rights of real estate objects above or below the ground surface. As a result, public facilities, like roads and streets have not been the part of many land registry and many objects have been constructed above or below the ground surface of public domains. Furthermore, the delineation of surface parcels, spatial sub parcels and spatial parcels that are vertically layered require spatial description, including data defining the vertical and horizontal boundaries between these units. The ability to present spatial characteristics of land parcels will allow a better definition of cadastral spatial subdivision with three-dimensional presentation, so that it will provide better results for inspection and analysis of data (Shoshani et al., 2004).

4.7 Limitation in Land and Cadastre

Current cadastre registration systems, bounded on topological plan and geometrically described parcels, have shown limitations in location of three-dimensional constructions (for example pipelines, tunnels, building complexes) and in the vertical dimension (depth and height) of right established for three-dimensional constructions (Stoter and Ploeger, 2002; Stoter and Ploeger, 2003; and Stoter and Van-Oosterom, 2006).

In the last couple of decades, there has been demand in urban areas for dividing up ownership in buildings so that different owners can own different parts or can own a delimited space below ground, a demand which the existing legislation is unable to adhere to (Julstad, 2001). Prior to this, the question can arise from strata property ownership between one part used for commercial activities, for example shops and another part is used for housing purposes. It is better known as service apartment in Malaysia. In addition, another question arises from using of underground surface for different types of activity, which have no connection with the use of the ground above surface. According to Onsrud (2003), land below

the level of any surface property is called no-man's-land. Tunnels and other underground constructions in most cases such as in Malaysia are made without subdivision and formal registration in the cadastre and in the land registry. In fact, in most cases above or underground constructions have been considered as an extension and enclosed to the adjacent surface land as cross boundaries objects.

4.8 Limitation in Legal and Organisational Aspects

The traditional cadastre information which has served us for more than a century may not be able to be continued anymore due to the lack of advanced legal and organisational condition for the three-dimensional legalistic information in the new era. For example, the rapid and complex development of such complicated construction moving skyward in large city centres such as in Kuala Lumpur city, Georgetown of Penang and Johor Bahru of Johore (Tan, Khadijah and Ernest Khoo, 2009a). Therefore, in any major city centre, land use are becoming so intensified, as different types of land use and properties are located in a complex three-dimensional situation (Ahmad Nasruddin and Abdul Rahman, 2006).

From a general introduction by Ossko (2005), there are legal difficulties to register the objects, as properties, constructed above and below the ground surface in the traditional cadastral system and land registry due to some legal constrains since these have been created for on ground surface for a long time ago. In Malaysia, the main thing that hinders the progress has been the national legal systems (Tan, Khadijah and Ernest Khoo, 2009a), because there was no provisions on 3D property and lack of proper Malaysian cadastre law to cater the registration of legal and organisational aspects for 3D property units in full 3D cadastre as described by Stoter (2004). Therefore, the legal profession is always very conservative, they are always attached to the old and traditional land registry law and legal changes generally take quite a long time.

Cadastre consists of spatial and non-spatial land information while land registration consists of non-spatial (textual) information. Under the current Malaysian practice, the issue of dispute between cadastre and land registration is whether the existing 2D cadastre legislative framework and title registration in organisational framework is able to reflect the real world spatial and non-spatial information in institutional issue about the rights of modern construction and development. Meanwhile, the registration of properties in three-dimension is also different in countries running single authority of a unified land registry or separate cadastre and land registry under multi authority. In the case of multi authorities, the comprehensive decision-making is more difficult, but the implementation of three-dimensional registration by separate organisations maybe easier because the full data consistency between the organisations is not always compulsory by law. On the other hand, in the case of single authority unified land registry, there is one decision maker and the comprehensive solution is easier to achieve. The data consistency between the legal and mapping part is compulsory by law. Therefore, the implementation of three-dimensional registration is more complicated (Ossko, 2005).

5. GOOD GOVERNANCE

Good governance is one of the important issues in development of land administration system which affects the need for its information and accessibility. According to Steudler (2004), the concept of governance is not only about government, it rather recognises the power exists inside and outside the formal authority and government institutions (amongst the government, private sector and civil society).

In short, good governance is at the heart to good land administration. A successful land administration requires accountable, stable institutions, transparent and zero corruption

government. On the other hand, weak governance in land administration can lead to massive over regulation, conflicting production as well as gap-ridden laws, standards and legal documents (Williamson et al., 2008). Therefore, a national capacity is vital to formulate and implement laws necessary in implementing good governance.

5.1 E-Government

Since the twentieth century, land oriented infrastructures began to use all benefits of information and communication technologies to facilitate the processes of government and public administrations. These happened more rapidly especially during the twenty first century when the geographical information technology became more advanced and combined with the rapid growth of global information networks such as wider networks, mobile computing and the internet, making e-government widely known (Ting, 2002) whilst land oriented business is constantly evolving, looking for optimal solutions.

With the implementation of e-government, businesses between citizens and government services can be made available online every second. This enables government agencies to align efforts to significantly improve service delivery and reduce operating costs. As pointed out by Warnest (2005), an effectively deployed e-government initiatives make conducting business with government easier, on the other hand, privacy and security is maintained. It is important to note that e-governance is related to the utilisation of e-government combined with processes for wider consultation within and between government, private sector and the public.

Currently there is an increasing demand for rapid access to land related information as a strategic resource for development and business. The computerised multipurpose cadastre is one of the tools for the efficient handling of land, property related information beneficial to both government and private sectors, and land related information users across all sections of the community by adding value through the combination of data sets and making these widely accessible. In addition, United Nations Economic Commission for Europe (2005) noted that e-government could be successful only if it is properly designed and accepted by citizens, companies and administrations.

5.2 Intergovernmental Coordination

Land administration should ideally be under the supervision of a single authority that acts as the lead agency. Such an arrangement will guarantee the best possible coordination between the various parts of the whole process and provide the necessary framework for establishing a unified land information system and service. However, this ideal principle does not exist in most countries. In practice, many countries have a tradition of separate governmental institutions whereby the cadastre recording property boundaries and other information for taxation are separate legal registration systems under the control of federal ministry, and the local government being responsible for land and land use rights. Each ministry often makes its own rules, while co-operations between authorities depend more on personalities than on policies. This results in separate inquiries having to be made about rights of ownership and rights of use before any transfer can take place, leading to overlapping of efforts, inconsistencies and hence inaccuracies in the data with additional costs (United Nations Economic Commission for Europe, 2005).

I strongly support the idea that one way to ensure closer cooperation between government bodies is to establish a higher level of land administration coordination board, such as the National Land Council or better known as *Majlis Tanah Negara*. This mechanism can help to coordinate the administration of land and the environment and can develop policies for handling land related data that are in line with the federal government and its local author-

ities. It can help to reduce overlapping powers between ministries, increase efficiency, and provide a forum in which improvements to land administration services can be discussed in the light of changing circumstances and any consequence needed to amend the law. It can also recommend policies for archiving data that may be needed in the long-term national interest and address personal privacy matters as well as the confidentiality of data in order to protect the interests of private citizens.

6. TOWARDS 3D PROPERTY FORMATION

The development of 3D cadastre registration are more on the technical part where researchers study on the process of adding 3D cadastre objects in the current cadastre data model and information, accessible amongst the Department of Survey and Mapping Malaysia, State Land and Mines Office and District Land Office. Unfortunately, the two stated database, which are Cadastral Data Management System (CDMS) and Computerised Land Registration System (CLRS) database works separately in different authorities and is still not in three-dimensional situation. As mentioned in this research previously, Malaysian Land Administration is based on the Torrens System where cadastral map and document of title with spatial and textual information as a legal evidence is required under the rules and regulations in order to have full institutional coordination. Therefore, a good institution is very important to achieve an excellent and wonderful cadastre registration system. However, due to historical constraints, it seems quite difficult to realise this unless with full cooperation from various legal bodies, technical organisations and other land related governments and private sectors.

Recently, the 3D cadastre proposed a registration model focused on the combination of these two different databases mentioned above and these two cadastre registration databases namely the legal rights, land attributes and the spatial objects geo-data. These three authorities mentioned above, are the main government agencies that are responsible for the cadastre registration system where they integrate and coordinate each other, in order to have an integrated and comprehensive cadastral system in Malaysia by using the 2D/3D hybrid cadastre approach (Stoter, 2004).

The 3D cadastre objects such as stratified buildings, construction above and below the ground surface are responsible by the Department of Survey and Mapping Malaysia, State Land and Mines Office and District Land Office on the ownership registration and object registration respectively. In short, 3D cadastre registration is a combination of land registration with plan land parcel and three-dimensional land parcel of cadastral registration. These are combinations of legal rights of land attributes, plane cadastral objects and three-dimensional information.

7. CRITERIA ASSOCIATED WITH THE ESTABLISHMENT OF MALAYSIAN 3D CADASTRE FOR 3D PROPERTY RIGHTS AND THE WAYS TO ACHIEVE ITS IMPLEMENTATION

The issues outlined in this section will prepared the basis of introduction of 3D cadastre for 3D property rights in Malaysia.

7.1 The Cost of Transition

Any transition from one system to another more advanced system necessarily entails inevitable costs. One should acknowledge that it could be rather difficult to calculate such transition costs. Despite this fact, an attempt is made below to present at least the main directions of the expenditures for the introduction of 3D property formation as well as the factors that influence these expenditures. Where possible, the estimation is done in mone-

tary terms, primarily according to the information available about the developments in the countries that are going to introduce 3D property formation.

First, it should be mentioned that the transition from existing formation to three-dimensional formation has only to take place when the benefits to be obtained from the new system outweigh the costs associated with its implementation. Otherwise, there is no reason to change the old system that, in this case can perform its functions to a satisfactory extent under given circumstances.

In my opinion, the following measures entail main expenses with regard to the transformation from existing method to three-dimensional environment:

- (a) Changes in the property legislation
- (b) Changes in the property registration system as well as its registration and maintenance costs
- (c) Changes in the handling of cadastral procedures
- (d) Preparation of the new instructions, regulations, handbooks and so on
- (e) Education of the people who are to deal with different aspects of 3D property formation, such as surveyors, registrars and other

7.2 Legal Issues

7.2.1 *The Necessity of Changes in the Land Related Legislation*

This issue associated with the establishment of 3D property formation, as has been mentioned in the previous chapters and sections, is the most important in the process of introducing 3D property formation because it forms the base for all subsequent activities. The process of changes in the current legislation is rather time consuming which is quite natural as the matter in question should be comprehensively investigated and the host of factors should be considered. On the other hand, if the alteration of the current property legislation as artificially speeded up in order to get the working system as soon as possible, the consequences can be that unforeseen problems will arise and the amendments to the already adopted legislation on 3D property formation will be needed. As a result, the process of removing the failures can take longer times than would be needed in the case of careful investigation.

In general, when deciding on the introduction of the 3D property formation into the current legislation, it is necessary first to clarify if there are some provisions in the legislation that allows consideration in handling 3D situations. Secondly, to clarify if these provisions are sufficient for the present moment, and for the immediate future, and thirdly, if not, what changes should be made? Property legislation in some countries is largely adapted to handling 3D situations that only minor or even no changes are needed to the legislation. If the need for the new system has been identified, it is then necessary to decide which changes and additions should be made to the legislation. If, on the other hand, a country's legislation lacks any provisions concerned with three-dimensional situations and the need for 3D property formation exists, the development of the purely three-dimensional legislation is a better alternative. The extent of the necessary changes and additions, which depends on the legislation, exerts great influence on the other legal, technical and organisational issues related to 3D property formation.

7.2.2 *Handling of Cadastral Procedure*

In principle, the introductions of 3D property formation must not significantly change the cadastral procedures, but some alterations in the old system are still inevitable. The appli-

cation for a cadastral procedure concerned with 3D property formation will still be maintained by the survey and mapping department. The same suitability conditions must apply as to existing properties. What is specific for the formation of 3D properties is that during the procedure, the survey and mapping department should hold more consultations with the planning and building department.

Together with conventional maps, construction drawings must have the possibility to be used as cadastral maps and serve for the determination of the new boundaries. It means that the survey and mapping department has to set up the requirements for these drawings. The survey and mapping department should, together with the professionals responsible for the project, control the drawings that are compiled by an authorised entity. If the survey and mapping department handles the drawings during the procedure, participation of a consultant who is literate in the property formation is recommended. The new property boundaries can be charted on the available drawings.

In general, cadastral procedures associated with 3D property formation are more time consuming than the normal ones because more factors should often be considered under the procedure. It may also require closer cooperation between the survey and mapping department with the planning and building department.

7.2.3 *Definition of Boundary*

The drawing of the precise boundaries between 3D properties will be one of the greatest problems. Boundaries must be so well defined that there can be no misunderstanding in the rights and responsibilities. These boundaries must be described in detail in the document of title and cadastral map. That is why it is necessary to pay due attention to the issue of boundary determination in 3D property formation.

First, the matter of outside the boundaries of a 3D property should be resolved. It is necessary to identify what else, besides the building or facility is included into a 3D property. Usually, the ground related in some way to the building or facility is included in the volume of the 3D property. For example, the ground on which the building is built, the ground area containing the exits from an underground property or the ground area between platforms in a 3D property.

It is obvious that the property boundaries can no longer be described by x and y coordinates. They should instead be described in detail using x , y and z coordinates in the documents of title and cadastral map and this should be done with such precision that any doubt should never emerge concerning the exact position of the boundary.

Another question is where to put the boundary between 3D properties within a building. It can be solved in different ways. In Malaysia, there are clear rules about it in the Strata Titles Act 1985 (Act 318) that the boundaries are in the middle of the walls, floors and ceilings and what is beyond this is common property. In other countries, for instance, in Sweden, it is up to a surveyor to decide where to put the boundaries in each particular case. The last approach is, in my opinion, more flexible than the first one as it allows finding a solution best suited to the particular circumstances. In addition, 3D property formation is such a complicated matter that it is very difficult to find some standardised solutions for the drawing of the boundaries.

7.2.4 *Management of 3D Property*

The introduction of 3D property formation has two contradictions. On one hand, each property should be as independent as possible from other properties. On the other hand, properties subdivided horizontally become more dependent on each other. Vertical relations between 3D properties become more complex than the horizontal properties. These

units cannot be separated and the upper levels are dependent on the support from the levels below. The underground is dependent on the upper levels for upward outlet, ventilation, drainage and passage purposes. When several properties are in such close connection within the same building complex or construction, it is also important that there are clear rules about rights between neighbours to get access to maintenance, repairing and building work. In the Swedish Land Code, for example, there are provisions intended for the protection of a property owner from the damage caused by non-maintenance of the neighbouring property. If, for instance, bearing to a fixed point for constructions in a building are included in 3D properties, there is a great risk for such damage.

Management of common property can be conducted through a Management Corporation or Joint Management Body for strata scheme that has not been subdivided. In complicated cases, a professional manager can be appointed. When all the owners take part in the management corporation, it can be easier for them to be aware of the costs and needs to be fulfilled, but for large schemes, self-management can be too complicated and then it is more convenient to let a professional manager to take care of it. Clear rules must also be established for all management corporations, because of the problems and disagreements that can arise. Problems can occur, for example, with the management of a building containing residential, commercial, office, car parking and shopping complex properties, such as in service apartment concept in mixed developments. The cooperation matters become difficult to handle in this case. Different property owners may have different views on what condition is considered good for the building and how much money should be spent on the management. Those living in the residential properties will not think so, evidently, invest in the renovation and repainting that puts the building in a good condition after every 20 years. On the other hand, a professional manager who takes care of the retail properties on the ground floor would have completely different interest in the building being in a good condition. This shows that clear contradictions may exist concerning the condition in which the properties should be held.

7.2.5 *Fire Protection and Insurance in 3D Property*

When usual property formation is concerned, a building constitutes one property and thus has one owner. The fire protection of the building in this case means that the building is constructed in such a way that it can withstand fire until all people have been evacuated from the building. In the case of 3D property formation, there may be many property owners in the same building, who will be affected in case a fire breaks out. Therefore, the need exists for developing measures against fire spreading within building.

The most common way of the fire protection is a firewall, which is a metal or concrete wall with very high withstanding capacity that will prevent fire spreading between properties without help of a fire brigade. It is quite easy to limit fire spreading horizontally between normal properties but in the case of 3D property formation, there is a risk of fire spreading in the vertical direction between different properties. Most often, it happens through windows. However, this can be resisted in different ways by:

- (a) Larger safety distance between windows vertical wise
- (b) Fireproof windows that are cannot be opened. However, these are inappropriate for dwelling purposes
- (c) Introduction of a kind of firewall that limits fire spreading in the vertical direction
- (d) The use of sprinklers that are automatically activated in case of fire

Another important issue related to the security of 3D properties is insurance. With 3D property formation, many owners and different activities can be gathered in the same build-

ing. Therefore, it is important to have clear rules about the insurance and to regulate the relations between the different kinds of insurance, such as what should be included in the insurance for building, for the private units and for the common property.

7.2.6 Building Renovation Issues

3D properties that most often tend to encompass a building or facility are subject to obsolescence because of time. It means that with time the question of renovation of building or facility or part of the same can arise. Sometimes, it may be even necessary to demolish a building or facility. As 3D properties within a building are considerably dependent on each other, it is necessary to have clear guidelines in the legislation concerning undertaking such measures.

First, any works aimed at renovation or demolition of the existing building or facility or part of the same must require an official permit. The property owner applying for such a permit should gain consent from other property owners affected by the measure. Otherwise, the application will be rejected. Any works being undertaken in connection with building renovation should be carried out in such ways that no substantial damage or inconvenience are caused to the adjacent properties. Otherwise, the question of compensation should arise.

7.2.7 Registration of 3D Property Rights

The matter of registration is one of the most discussed one when it concerns 3D property formation. It is obvious because the main objective of any property register is to warrant legal security in property transactions. The registration is thus not an aim in itself. The primary target, from a legal point of view, is to make 3D property rights certain and transferable and, in this way, to make the multi use of space practically possible and attractive to the market. Therefore, all the legal situations, especially those related to complex three-dimensional cases, have to be represented in the register in a correct way and the registration should provide an insight into the actual legal situation in a simple, straightforward and sustainable manner.

Discussing about 3D property rights registration in the most general sense, one can point out first, that such registration will be, in one way or another, incorporated into the existing property registration framework of a country wishing to introduce 3D property formation. It is obvious that the introduction of purely three-dimensional registration would entail huge changes in the law and it, in itself, rather non-purposeful, because 3D property formation is often needed only for intensively used in urban areas. In many situations, normal registration is still sufficient and this will be the case in the observable future. The two types of properties will therefore co-exist in the registration system.

As we saw in the previous sections, the main distinctive feature of 3D property formation is the vertical dimension being taken into consideration, and should be explicitly represented in the register. Therefore, from this point of view, it is important to understand how this dimension can be shown in the register, along with other relevant information on a particular 3D property. Another important issue is the relationships between different 3D properties as well as between 3D properties and normal properties. In order to get a good insight, let us look at Sweden that has developed good prototypes of three-dimensional registration system.

7.3 Technical Issues

The technical perspective of 3D property formation has been paid great attention in recent years in many countries, primarily because technological achievements have made it possible not only to create models of 3D models of 3D objects but also to visualise these object

in 3D space. In addition, the new methods of 3D data acquisition have become available. All these facts increased the interest to three-dimensional issues in real estate property domain because now it turns out to be possible to establish a closer link between the real world and legal objects that represented in the register, which could add to the overall efficiency of the whole system of property rights. In my opinion, two general groups of such aspects can be identified:

- (a) The creation of a 3D data model in order to implement 3D objects into the current ordinary land information system
- (b) 3D cadastral mapping

The first item is extremely important because without a 3D data model, it will be impossible to organise efficient management of 3D information in a property register. This problem can be separated into two different components:

- (a) Semantic data model
- (b) Geometric data model

The second group of technical aspects of 3D property formation is 3D cadastral mapping that is obtaining digital mapping of 3D data for establishing a cadastral information system. This is a very problem everywhere, in general, because current cadastral maps, which are paper or digital, based often on lack of altimetry information, for example, in the form of contour lines, not to mention that there is often no information, regarding the existing infrastructure below and above the ground. Even if the legal system of a particular country allows managing three-dimensional situations to a satisfactory extent without recourse to 3D property formation, the representation of these situations has always been plan dimension. In this respect, all countries face mainly the same problems.

As a conclusion, one can say that paying due attention to the technical issues aimed at the establishment of the information base of 3D property formation results in getting the system that is capable of performing its tasks with a high degree of efficiency. It is also important to realise that, once obtained, three-dimensional information can be used for many purposes such as in city planning, city management, environment impact assessment and so on.

7.4 Organisational Issues

The success of any system of property formation and property registration is dependent on how the legal, technical and organisational aspects are resolved with regard to this system. One of the most important matters is to decide on the authority responsible for three-dimensional registration, survey and mapping. To the great extent, it depends on the current organisational framework in a particular country. To solve the registration of 3D properties requires comprehensive tools and solutions in legal and technical sides, practically in the cadastre and land registry. If the country in question has different authorities dealing with these two matters, the comprehensive decision-making is more difficult but the implementation of three-dimensional registration in separate organisations can be easier since the full data consistency is not always compulsory by law. This is the case with Malaysia where the registration of titles are by the State Lands and Mines Office and District Land Office while the survey and mapping falls under responsibility of Department of Survey and Mapping Malaysia, a federal agency.

In the case of a single authority responsible for both cadastral and land registry, there is one decision maker and the comprehensive solution can be achieved easier. However, as the data consistency between the legal and mapping part is compulsory, the implementation of

three-dimensional registration is more complicated. It means that the solution of three-dimensional registration should be simultaneous in the legal and mapping parts of the system.

8. RECOMMENDATIONS FOR AMENDMENT

As has been mentioned in this study, the need of the introduction of 3D property formation exists in Malaysia, mainly in large cities. Therefore, we should look at the legal situations where 3D property formation can be relevant and what changes should be made to the current cadastral and land law in connection. Analysis of the Malaysian legislation allows us to state that it already provides for some elements of three-dimensional concerning property. According to the definition of real property given in the Real Property Gains Tax Act 1976 (Act 169) as any land situated in Malaysia and any interest, option or other right in or over such land. Meaning that it is possible to own property where dimension is on surface, above surface and below surface. The matter of ownership of these three dimensions has been very important concerning 3D property rights.

In order to make it possible to create 3D property in Malaysia, some changes will be needed to the legislation. It is necessary to make provisions for defining complicated building structures, especially those including the underground space and air space as separate 3D property. As far as utilities are concerned, it would also be useful to define them as a kind of 3D property so as to deal with them as integral legal objects, not divided among different parcels. The owners of these utilities, some of which are quite influential companies, can well be interested in the clear definition of all the legal issues with their possessions, which gives better security, and thus could form a room for working and adopting of the new legislation.

9. CONCLUSIONS

Malaysian land and cadastral registration is thought to be served by a transparent and accessible registration of rights to properties. Current cadastral systems that were traditionally parcel based meet complications when maintaining and providing information on the legal status of property in three-dimensional situations. The actual needs for a 3D cadastre and 3D property registration consist of general, fundamental needs for a 3D cadastre, but also of country specific needs. General needs addressing the issue in how to maintain and provide three-dimensional information on properties in cadastre systems, which are traditionally based on a flat surface cadastral map and registry title.

The development of modern society, being most active in urban areas, results in high pressure on the land use. Nowadays, many cities including those in Malaysia are often met with the problem of the lack of land for development that leads to the intensive use of space above and under the ground surface. Consequently, legal situations occur when different activities are located on different level of space. The experience shows that handling such situations within the existing traditional property formation framework does not allow providing a clear insight into the related property rights, and this framework is not adapted to the future when more complex situations may occur.

Therefore, a new approach is needed which could overcome these deficiencies. Such approach is called 3D property formation and implies the system of measures aimed at the establishment of properties with the rights on them being explicitly defined both horizontally and vertically. Historically, property rights have been considered three-dimensional for quite a long time, but the lack of explicit vertical delimitation of these rights did not allow true 3D property. The need for 3D property formation exists also in Malaysia and

thus the ways to implement this possibility into the current cadastral and land law should be considered.

A number of organisational issues must also be solved to get a well functioning system. They are the responsibility for 3D registration, preparation of guidelines, regulations, sec-ulars and instructions as well as training of experts in the field of 3D property formation. Based on the above mentioned, possible directions of the establishment of 3D property formation in Malaysia have been outlined. The target groups are property above and below the surface, which includes structures attached to a multi-layer building, the using of air space, complex building structures encompassing underground spaces and utilities as well as building structure above public road. Since it is possible to own strata and stratum prop-erties in Malaysia by Strata Titles Act 1985 (Act 318) and National Land Code 1965 (Act 56) respectively, only the addition to the current legislation would be needed. First, neigh-bour relationships issues and management of common areas and second, the rights of own-ership, fire protection, insurance and boundary definition. In order to be able to define above and underground spaces and utilities as 3D properties, the development and adoption of the new legislation would be needed.

10. FURTHER RESEARCH

From the discussion of the above results, there are some recommendations that can be made for future research. This study has just outlined the main problems associated with 3D property formation. Further research, of course, could be recommended to get better under-standing of the whole matter that will, most likely, dominate in the land and cadastral relat-ed legislation. A number of legal, technical and organisational matters are still to be inves-tigated. Besides that, as more and more countries introduce 3D property formation and more experience is accrued, new problems will emerge, and ways to solve them will be needed.

Therefore, an intensive Three-dimensional Real Property Formation Act is needed to accomplish better methods in 3D property rights, meaning that the judicial framework in Malaysia should be further examined. 3D property registration is only possible when the judicial framework provides the possibility to establish volume parcels that is above, on and below the surface. Therefore, further research should focus on the questions that were pro-posed by Stoter (2004) that I found to be very suitable in Malaysian situations. Among the questions are: (a) How flexible is the definition of ownership rights of land from both judi-cial and a cadastral point of view? (b) Is it possible to establish volume parcels as in Sweden without changing the major land and cadastral legislation? (c) Are the judicial complexities to establish 3D property rights higher than the benefits? In addition, further research is required on what kind of three-dimensional information needed in Document of Title, Certified Plan other than that had been suggested in this thesis and how this informa-tion should be collected, structured and offered to make 3D cadastre for 3D property rights possible in Malaysia.

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ARTICLE

Malaysian 3D Property Legislation: A Preliminary Approach

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ABSTRACT

Malaysian land administration provides a variety of rights, depending on the traditions but the legacy cadastral system and land law are still using 2D geometry in legal and law expression for land and property tenure and not prepared three-dimensionally. These entire binding and legal document do not give enough three-dimensional legislation information for multipurpose cadastral system in Malaysia.

The aim of this paper is to identify the problem in current Malaysia Cadastral System. Besides, it describes the overview of cadastral system for 3D purpose and the situation in Malaysia. Some cases on 3D situations will be illustrated concerning the 3D property in Malaysia. Throughout the paper is become clear that quite a lot of study will be needed to realise the 3D cadastral for 3D property rights in Malaysia. Finally, scope, significance, contribution and conclusion of the research are presented.

Keywords: land, three-dimensional (3D), cadastre, property

1. INTRODUCTION

One of the important issues with regard to property is the inadequacy of vacant land for rapid development. Many countries, including Malaysia, do not have enough vacant land on the ground surface to cater for the rapid development. Forrai and Kirschner (2002) observed that the availability of land use for future and further construction would be both expensive and limited in general. This is particularly true in big cities that see increasing numbers of mixed settlements amidst modern skyscrapers. This can be supported from a finding of questionnaire survey done in this research where fifty (47.2%) out of 106 respondents agreed and 16 (15.1%) respondents strongly agreed that some of the buildings had been built on top of each other or crossed boundary edges in real estate developments in Malaysia. As the demand and competition for space on land surface intensifies, the three-dimensional aspect in property formation assumes an increasing importance. In recent times, this three-dimensional aspect plays a significant role in determining the rights of property unit through legislation, especially in areas with multi-level mixed developments in Malaysia. It supported by almost equal numbers of respondents (45 or 42.5% and 42 or

39.6%) strongly agreed or agreed respectively that there was a need for a legal registration status of 3D property. The so-called *THREE-DIMENSIONAL (3D) PROPERTY* that skyscrapers and other multi-level developments in urban areas are often regarded as; is a special category of property, separate from the traditional property, although in many countries, including Malaysia, have integrated these two types within the same legislation. Examples of such property unit can be found in the following situations: property above surface, such as constructions on top of each other, overhead infrastructure and utilities & the use of air space; property on surface, such as multi-storey buildings and landed properties in gated and guarded community; and property below surface, such as underground infrastructures and utilities.

2. BACKGROUND AND CONTEXT

A systematic record of land matters involving registration of the details of transaction, such as transfer of land and interest, lease, charge, easement and change of condition of the land is very important in land administration, planning and development. For this, a good land administration system is needed. As stated in the United Nations Economic Commission for Europe (1996), land administration consists of a Cadastral Survey and Mapping Registration System, and a Land Registration System. These two systems are very important for the formation of a good Land Administration System. As known by land administrators and land surveyors in Malaysia, cadastre is an information system consisting of a series of maps or plans showing the size and location of land parcel/parcels together with text records that describe the attributes of the land (Tan, Khadijah and Ernest Khoo, 2009b). It supported by the results of the questionnaire survey that showed more than half, 23 (51.1%) and 28 (62.2%) of the respondents felt that the current cadastre system, surveying and mapping methods were understood by land administrators and land surveyors in Malaysia.

In a cadastre system, the subdivision/partition of the surface into individual property unit, and amalgamation of many individual property units surface into one surface was originally applied only on surface boundaries. However, the use of a property would be impossible if the right of ownership is only applied to the actual land surface, excluding the dimension above ground surface and dimension below ground surface. Therefore, ownership rights are often not limited to the vertical horizon, but theoretically extended from the centre of the earth to the infinite sky (Stoter, 2004). Nowadays this is still the case in many countries, even though the property rights can be restricted in the vertical dimension by other rights, such as mineral and flying rights (Stoter, 2002). No reference was provided on the exact height or depth at which property rights are restricted.

3. PROBLEM IN CURRENT MALAYSIAN CADASTRAL SYSTEM

In the last couple of decades, there has been a demand in urban areas for dividing property ownership so that different owners can own different parts or can own a delimited space on, above or below ground surface. When multiple uses of space above surface was started by high rise constructions and aviation, it brought forth the question regarding whether such space could be subdivided into separate units for ownership had to be discussed (Sandberg, 2003). This has caused an emergence of situations where the dimensions above and below the ground surface are an important factor for property objects.

Putting troubling features under the ground surface is a good way of saving the surface on the ground for other attractive land use. Multi-layer developments have also been necessary due to railway stations occupying extremely large areas in city centres and construc-

tions above and below traffic routes, a phenomenon that started early in large cities in United States (Sandberg, 2003).

The development above and below the ground surface can be facilitated by guaranteeing the property rights of owners. It is also believed that three-dimensional registration of proprietary rights promotes investment in such development projects (Doytsher, Forrai and Kirschner, 2001). The interest in urban areas for using land above and below ground is often connected with investors who are interested in making rights more secure and transferable (Paulsson, 2007).

Other factors causal to the better interests of investors in constructions below or above the surface are augmented demands of building sites in metropolitan areas, higher land prices, new construction techniques and architectural trends as well as enhanced and cheaper methods for drilling in rocks. This has guide to a demand from the market for facilitating financial transactions for such constructions (Onsrud, 2001). This is similar to the registration system of land tenure title in Malaysia where it contains rights about the proprietor. As a result, different rights may exist in an integrated 3D property objects, hence resulting in the difficult of any decision-making on a lot/parcel. From the survey, altogether, 95 (89.6%) respondents responded that appropriate new legislation had an important role to play in recognition and registration of 3D property rights for Malaysia. Almost half of the respondents 43 (40.6%) and 44 (41.5%) either strongly agreed or agreed that it should be made compulsory for those obtaining a new 3D property rights in land in order to register those rights, whether on, above or below ground surface. However, not all restrictions and imposed conditions are stated clearly in the register as there are some that are provided by law and have to be complied by the proprietor.

Again, according to Paulsson (2007), several parties can simultaneously use one parcel, with rights limited in the third dimension. It is possible to use 3D properties for different types of facilities, both below and above ground surface. An example is a building divided into many parcels with different owners, or shopping block above the public/state road. In Malaysia, state roads and municipal roads belong to state government while federal roads belong to federal government (Tan, Khadijah and Ernest Khoo, 2009a). A good transportation system will reduce infrastructure costs and to increase the number of housing units built to maintain a comfortable residential environment (Tan, 2001). In general, the use of a good road system will benefit in terms of security, reduce infrastructure costs and increase the number of housing units to maintain a comfortable residential environment. When a private property is constructed above the public road, it is difficult for the cadastral system to recognise two or more different owners at the same time in the present legal documents that mentioned previously.

Numerous situations can potentially give rise to disputes in property rights in the modern three-dimensional environment. For instance, in mixed development of service apartment, questions of ownership are likely to arise where some parts of a building are used for commercial activities and other parts of the same building are used for housing purposes or a grant to build an office block above the tracks of a railway line (Stoter and Ploeger, 2002). In addition, the use of underground surface for different types of activities that have no relation to land use on or above the ground surface will complicate matters further. Underground space is often used for access and support, mining, infrastructure systems, such as cables, water and drainage, and transport, such as parking space, railway and roads (Sandberg, 2003). According to Onsrud (2003), land below the level of any surface property is called 'no man's land'; these tunnels, storage spaces or other underground constructions are made without subdivision and formal registration in the cadastral survey as well as in the land registry.

Again, where several private and public properties are closely connected within the same building, it is important that clear rules exist on the rights between neighbours in order to gain access for reasons of maintenance, repair and building work (Paulsson, 2007). The examples are creations of common property, right of way or easement. Access to these properties from the ground level must be resolved and the ownership and management of facilities that are not included in the apartment units, as well as the building structure and spaces between them, must be clarified. There is no doubt that it is important to regulate the relationship between the individual owners of rights. These matters are not always resolved in detail by law, but may be treated differently from case to case in the cadastral procedure. In addition, fire protection and insurance for the building and its units are issues that are of importance when many property units are united in one single building (Paulsson, 2007).

In Malaysia, there is a lack of proper legislation regarding 3D property in land and cadastral law to cater for the registration of any related legal and technical aspects. Based on the analysis from the 106 valid returned questionnaires, 76 (71.7%) respondents were of the opinion that there was no land law, which embodied a right for people to hold and dispose of private rights in land in a 3D environment. Many conflicts seem to exist between laws and statutes with the current cadastral status. Therefore, the rights associated with this registration should be clear in the registry titles issued. About one-third (33.0%) respondents thought that the current land laws defined 3D property rights clearly while 61 (57.5%) responded that they did not, and 10 (9.4%) were unsure. As a result of this, perhaps better 3D visualization should be developed and employed.

For example, firstly, Strata Title Act 1985 (Act 318) allows land to be subdivided into parcels or land parcels based on the area occupied. Secondly, National Land Code 1965 (Act 56) allows air space rights above ground surface up to a maximum of 21 years in form ranging from an absolute conveyance to splitting off individual rights associated with the air space parcel. A majority of the respondents, 69 (65.1%) out of 106, thought that the new 3D property should be registered as leasehold rather than freehold properties. If leases were registered, two thirds of the respondents, totalling 73 (68.9%) and 22 (20.8%) felt that the leases should run at least 60 or 99 years respectively to maintain the worth of the asset and for it to be easily transferable. Eleven (10.4%) respondents opined that the lease should only be 21 years. This is always used in complicated urban multi-level mixed developments, or in the allocation of property rights concerning underground facilities in large urban areas (Mytrofanova, 2002).

There are currently many arguments about the surface under different categories of land use, subdivision, partition and amalgamation. These arguments would evidently be different if 3D property rights are used. Without the possibility of using 3D properties, other legal rights have to be used to allow separate parties to use different parts of one building or property. Such rights invoked include easements, common property, joint property or joint ownership with an individual right to use a specific part. However, each of these forms has certain disadvantages and limitations. The need for numerous uses of space and access to three dimensionally defined spaces in general is not resolved satisfactorily with only the traditional definition of property, thus calling for the introduction of ownership rights to three dimensionally defined spaces. To make such rights possible, different and new legal institutions have to be created, such as condominiums and air rights (Sandberg, 2003). Again, 3D property rights can take on different forms and can vary from full ownership to rights of different extents (Paulsson, 2007).

Some common law jurisdictions have legislation permitting air space rights above ground level in forms ranging from an absolute conveyance to splitting off individual rights asso-

ciated with the air space parcel. This is often used in a complicated town development in large multi-layer construction projects or in the allocation of property rights concerning underground facilities in massive urban areas. It can be said that the legislation found in common law legal system allows for a vertical division of space, with one party owning the strata structure, another one owning the land surface, and yet another owning the air rights. However, for civil law system, this is more tricky due to a stricter adherence, which the owner of the land has ownership that also extends unlimited into slay and down into the earth. Conversely, this traditional doctrine was formed at a time when there was little use for subsurface space (Sandberg, 2003).

4. RESEARCH QUESTION

The hypothesis of this research is that — *what contents in general, in the relevant legal documents, documents of title and documents of strata title, certified plan and certified strata plan have to be amended or in order to translate the legal expression from traditional cadastral practice to future cadastral practice for 3D property* — whether a new legislation should be introduced or only amend the present legislation where type of provisions in the new 3D property rights' regulations and practices are needed to be inserted in the National Land Code 1965 (Act 56), Strata Title Act 1985 (Act 318), and the Building and Common Property (Maintenance and Management) Act 2007 (Act 663).

On the other hand — *what kinds of criteria are required to establish and implement in cadastral procedures where these 3D property rights could affect the Cadastral and Land Administration Systems practices* — if the present legislation is adequate, then in regards to the technical aspects.

5. RESEARCH OBJECTIVE

In view of the current Malaysian Cadastral System, the main task of this research is to reformulate, further improve and enhance the usefulness of the existing cadastral system and title registration of multi-layer properties. To realise this, the objectives of this research are:

- a) To establish the fundamental principles in cadastral survey and mapping of 3D property rights by studying cadastral systems in Sweden, and to match those systems to the needs of the Malaysian Cadastral System.
- b) To examine the rights of land and property that dimension above, on and below the ground surface as provided by the National Land Code 1965 (Act 56), Strata Title Act 1985 (Act 318), the Building and Common Property (Maintenance and Management) Act 2007 (Act 663), Certified Plan and Document of Title, and to make recommendations for changes to facilitate a modern Malaysian Cadastral and Land Administration Systems.

6. RESEARCH METHOD

This study was conducted to find out the problems in current Malaysian Cadastral System and how to improve the system towards sustainable multipurpose cadastre. The research was divided into two stages. The first stage involved secondary data collection and analysis. The second stage involved development of instrument based on first stage, primary data collection and analysis. The contents obtained from secondary data collection will be the basis for further study. The current study will be based on the document analysis of the secondary sources comprising of the contents from three (3) types of local legal documents. The legal documents data are National Land Code 1965 (Act 56), Strata Title Act 1985 (Act

318) and the Building and Common Property (Maintenance and Management) Act 2007 (Act 663).

In second stage, a quantitative approach's questionnaire survey was formulated to compare the collective perceptions of personnel from various government authorities and professional firms. The questionnaire surveys concentrate on the land administrator, planner and valuer from State Lands and Mines Office, State District Land Office, the Department of Director General of Lands and Mines Office and the State Local Authority (Valuation and Property Management Department and/or Town Planning and Development Department), and also on the surveyors from Department of Survey and Mapping Malaysia and Licensed Land Surveyors from Penang, Selangor, Federal Territory of Kuala Lumpur and Putrajaya and Johore.

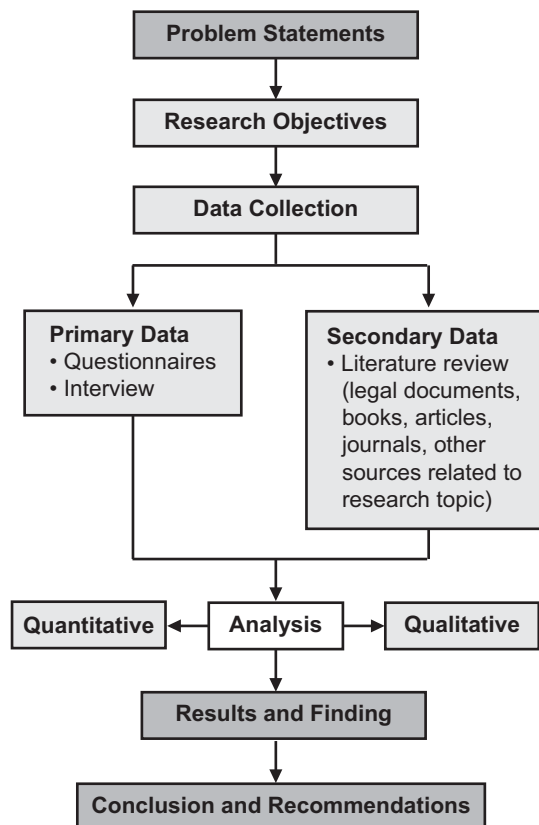


Figure 10: Research method flow chart

7. THE CADASTRAL SYSTEM

In 1994, Working Group 7.1 of the FIG was assigned to develop a vision for a modern cadastre of 20 years into the future, to be known as Cadastre 2014. To develop the vision, the Working Group took into consideration essential matters in the era of new public management (Kaufmann and Steudler, 1998). In addition, another cadastral system based on three-dimensional cadastre object modelling proposed by Stoter provided boundary certainty of multi-level objects and property ownership in 2004 (Stoter, 2004). This was essentially the 3D Cadastre.

Previously, cadastral system and the philosophy related to multipurpose cadastre had continuously to evolve in response to changing global and regional needs since the initial modern cadastre in the early 1980's (Harcombe, 2001). In addition, by the year 2000 the cadas-

tral system was seen as a multipurpose governmental engine that operated best when they served administrative functions in land rights and focused on delivering sustainable land management. This means that a mature multipurpose cadastre could be considered as a land administration system in itself (Enemark, 2009). Another illustration by Ting and Williamson (1999) showed that the achievement of a useful multipurpose cadastre was made possible through the potentials of the information revolution and the technology that has continued to evolve with it. Concurrently, other key works on the cadastre such as the ones by Benhamu and Doytsher (2001) and Benhamu and Doytsher (2003) have illustrated that the three-dimensional boundaries and parcel in space to be determined by 3D cadastre is capable of serving the legal and physical objectives.

8. THE NEEDS OF 3D CADASTRE/3D PROPERTY

The basic land code in land administration adopted by many countries includes special legislation governing the operation of the cadastral survey and mapping, and land registration systems that addresses the nature of the land and real property. Land administration in every country is aimed at ensuring an undisturbed performance of ownership rights. Thus, the ability to fulfil this task demonstrates the extent of society's ability to organise the legal basis for land ownership. In this regard, legal relations must be precisely defined in land law and in other laws that are related to properties.

Thus, there is a necessity to find a suitable cadastre solution for multi-layer constructions. The traditional cadastral system and land registry based on ground surface have not taken into consideration to register this utilisation of land in a three-dimensional situation. As in Malaysia, only 11 (24.4%) respondents felt that the current registry was adequate and 4 (8.9%) remained unsure while there were two-third, 30 (66.6%) of the respondents who either agreed or strongly agreed that the current cadastre system was unable to handle the registration of 3D properties under the existing legislation.

Therefore, the proposed new cadastre system should be able to represent the actual situation and not just the parcel on ground surface. The implication of these new ways of land use due to a high demand for ground space means that changes must be made to the traditional paradigm to address the legal aspects. It is anticipated in the near future a new cadastre will have a system that is complete, systematic and comprehensive, besides containing updated documentation of public and private rights, ownership, land use and real estate in the various spaces. Therefore, a modern cadastre system should always reflect the existing situation of all property rights, including a mixture of private and public properties. Moreover, according to Dimopoulou, Gavanas and Zuntelis, (2006), this new cadastre system would provide a better-rationalised management of the built environment, including regulations of legality of use or of economic applications.

It is true that 3D property is similar to the traditional surface property in many of its features. Just like traditional property, 3D property can be transferred, mortgaged, inherited and expropriated, as well as be created by available cadastral procedures, such as subdivision, partition and amalgamation. The 3D property addressed in this research, however, is treated as a separate kind of property in contrast with property above surface, property on surface and property below surface in terms of the latter is legal and technical features. Hence, a specific feature of 3D properties is that they are actually sections of space located on, above or below ground surface. These spaces can lie under or above the traditional on surface property or even another 3D property (Onsrud, 2001).

3D properties can divide into public ownership, common ownership, management ownership and private ownership, the main problem is to clearly define and protect the rights in

3D properties. This requires the 3D Cadastral System. Within the constraints of the present land registry system, various difficulties were encountered in registering the ownership and other rights of properties that are located on, above or below the ground surface. Based on the analysis from the 45 returned questionnaire from Department of Survey and Mapping Malaysia (DSMM) and Licensed Land Surveyor responding to whether the legal system recognised the various 3D properties, 14 (31.1%) answered in the affirmative whereas nine (20%) disagreed. Nearly half (22 or 48.9%) the respondents skirted the issue. The aim of the cadastre is to survey, record and register the rights and interests to the land that the law recognises, as these rights and interests as a legitimate relation between a rightful claimant and a certain lot of land. Therefore, without a clearly defined law, the mechanisms for acquisition, transfer, protection, restriction, creation as well as recording or registration of these 3D property rights and interests are meaningless in the cadastre (Molen, 2003).

9. MALAYSIAN CADASTRAL SYSTEM

Traditionally, the Malaysian Cadastral System consists of different structures. Where, the jurisdiction for land registration is under the administration of the state government while cadastral survey and mapping is under the federal government and is managed by different government authorities. It was generally felt that, there should be one, and only one, authority conferred with the power to grant and authenticate land titles. There was concern that the security of tenures could otherwise be jeopardized. Accordingly, 82 (77.4%) respondents expected it to be easy to register properties in 3D with a single authority although 24 (22.6%) respondents thought it would be similarly easy with multiple authorities.

There are two systems in the Malaysian Cadastral System, namely Cadastral Database Management System (CDMS) and Computerised Land Registration System (CLRS) operated by the Department of Survey and Mapping Malaysia (DSMM), State Land and Mines Office (PTG) as well as District Land Office (PTD) respectively (Tan, Khadijah and Ernest Khoo, 2009c). Both systems deal with properties located below, on and above the ground surface. There are 68 (64.2%) respondents felt that the law should place responsibility for maintaining the 3D land register on a specific government authority while 25 (23.6%) respondents did not agree while 13 (12.3%) respondents responded that they did not.

The Cadastral Database Management System database stores information about land attributes, spatial objects and other things while the Computerised Land Registration System database stores information on land ownerships, land tenures and so on. From the 45 returned questionnaire from Department of Survey and Mapping Malaysia (DSMM) and Licensed Land Surveyor, more than two-third, 37 (82.2%) of the total respondents either strongly agreed or agreed that DSMM should be responsible for maintaining the survey and mapping of registered 3D properties, whereas only 5 (11.1%) respondents were moderate in their view. Nevertheless, these two systems work separately in each organisation and have different legal aspects, which are still in traditional method.

After the final survey of an individual parcel of land or a number of lands, a cadastral map, or better known as the Certified Plan would be produced for those plot/plots of land. A Certified plan is prepared following the format determined by the Department of Survey and Mapping Malaysia. It shows the lot boundary in various scales with a given plan number as well as any information pertaining to the lot location, number, area, bearing and distance. Out of 45 respondents, 26 (57.8%) respondents were of the opinion that all perimeter boundaries of the 3D property were identifiable. Nevertheless, 13 (28.9%) respondents

thought otherwise, while the remaining six (13.3%) were unsure whether physical or virtual boundaries were identifiable.

Many respondents felt that other relevant information on 3D properties and their regulation should be collated. Unlike the situation where the limits of the properties were only surveyed and indicated on plans, 3D geographical visualization methods could be employed to record many identifiable features as land users, facade, front, back, and side elevations, services, utilities, lamppost, traffic lights, even the roof, and the whole multitude can be captured and shown. The captured features and data would vary according to need.

Immediately after the approval of Certified Plan, the document of title, such as Registry Title and Land Office Title would be prepared, approved and issued to the owner. The Registry Title refers to the title evidenced by a grant or State lease or by any document of title registered in a registry under the provisions of any previous land law. On the other hand, the Land Office Title means title evidenced by a *Mukim* grant or *Mukim* lease or by any document of title registered in a registry under the provisions of any previous land law. Unfortunately, most Certified Plan and Document of Title only represent the rights of ground surface level with parcel by descriptions on surface boundaries and rights of above and below surface level.

There was a strong group of 99 (93.4%) respondents that supported the development of a new legislation integrating 3D property rights aspects. Present cadastral mapping is moving towards a system whereby property can be manipulated, processed, and managed in a three-dimensional environment. The mapping system that is being contemplated in Malaysia provides vital information, including location and ownership for properties. Whereas the current cadastral information serves present needs, there will be a time when the currently compiled information can no longer cater to more advanced and complex situations that result from innovative developments of the big city. What will inevitably be required, therefore, is a more advanced system that incorporates suitable legislative and technical solutions in parallel with the implementation of 3D property rights.

In Malaysia, the cadastral system that has served us for more than a century may not be able to continue doing so due to the lack of an advanced level of legal and technical framework. Only 12 (11.3%) of the respondents were very satisfied and 36 (34.0%) respondents were satisfied with the current legal institutions in enforcing the land law. Twelve (11.3%) respondents were dissatisfied and 2 (1.9%) very much so. It would appear, therefore, that the legal institutions needed to be further improved to enforce land law satisfactorily. This is because land use is becoming so intensive, where different types of properties are now located in a complex three-dimensional configuration, especially in the city centre (Ahmad Nasruddin and Abdul Rahman, 2006).

The present land utilisation indicated that there is a growing need for above and below ground space. This traditional paradigm requires amendment. There are also issues pertaining to the cadastral map, the traditional paper based and digital method of Certified Plan and Document of Title, as they are no longer legally and technically adequate. A case in point is storeys with different heights are represented as an identical flat plan in the multi-storey mixed developments. This is a clear indication that traditional cadastral method cannot illustrate the actual height of each storey and which depicts how each storey lies on top of the other. A survey shown seventeen (16.0%) respondents opined that current land laws were being enforced adequately in all types of development and 56 (52.8%) thought the law recognised 3D property rights in mixed developments. Meanwhile, eighty-two (77.4%) respondents and 39 (36.8%) respondents respectively thought otherwise. This is due to

lack of recognition or reflection in the cadastre. It is clear that the modern urban living and land usage needs are pushing hard on the existing laws. As an example, the transport hub at Kuala Lumpur Sentral where railroads, light rail transport systems, hotels, condominiums, car parks and various forms of utilities all crisscross over the same plot of land makes compliance with the provisions of laws difficult on the ground. Indeed, 88 (83.0%) respondents agreed that the practice on the ground reflected the provisions in the current land laws while 13 (12.3%) respondents responded that they did not.

Owing to the above-mentioned reasons, ownership of these 3D properties can be easily infringed and subsequently resulting dissension and legal issues. These problems associated with 3D properties can only be solved through suitable legal and technical approaches, thereby underlining the pressing need for comprehensive legal and technical solutions for 3D properties. Based on the survey findings, nearly half, 48 (45.3%), out of 106 respondents were dissatisfied with the Strata Titles Act 1985 (Act 318) and National Land Code 1965 (Act 56) regarding 3D property, with a further seven (6.6%) feeling very dissatisfied. Another 33 (31.1%) respondents found the situation acceptable while only 18 (17%) of the respondents either very satisfied or satisfied on this issue. It would seem that these two legislations need further improvement.

10. CURRENT PRACTICES OF THREE-DIMENSIONAL SITUATIONS IN MALAYSIA

In order to illustrate the way 3D situations are currently registered and recognised in the Malaysian Cadastral Registration, few situations were selected and illustrated here. The purpose of the illustration is to show if current possibilities are sufficient in the National Land Code 1965 (Act 56), Strata Title Act 1985 (Act 318) and Building and Common Property (Maintenance and Management) Act 2007 (Act 663) or improvements are needed. All these situations were selected because they represented a few types of 3D property problems that still occur in practice as well as their simplicity. This study is divided into three types, namely dimension on surface, above surface and below surface for buildings, sky bridges, basement parking, utility transmission lines, and transportation network.

The main characteristics of building properties are that many parties are involved in the ownership of the building and its related construction with different functions. Buildings are very valuable properties. Therefore, it is important to register it clearly and unambiguously in the cadastral registration. Meanwhile, infrastructure objects such as transmission lines and transportation network are objects that are necessary to transport electricity, vehicle and people. The main characteristics of infrastructure objects are the fact that they cross other parcel boundaries. According to Stoter (2004), from a cadastral point of view, it is important to register the property rights of these buildings and infrastructure objects, not only to know who the owner is but also to indicate who is responsible for the properties and objects in case of accidents and damage.

10.1 Situation 1: Prangin Mall and Kompleks Tun Abdul Razak in Penang

Figure 1 shows a good example of 3D situations (dimension above, on and below surface) of buildings, sky bridges above and basement parking below public road in Prangin Mall and Kompleks Tun Abdul Razak (KOMTAR).

On the cadastral map that shown in Figure 2, we can outline the building above ground surface (red line) and basement parking below surface level (blue line), which is located between Lot 398 and Lot 399 respectively below public road that is Lebu Lintang. Prangin Mall is the owner of the building. It has the recognised common rights of the whole building and can subdivide the building into individual parcels. Meanwhile, Penang

Municipal Council, the local authority holds recognised rights of ownership on the public road that is Lebuhraya. However, Prangin Mall possesses unrecognised rights of ownership on the building and basement parking above and below public road.



Figure 1: Buildings, sky bridges above and basement parking below public road

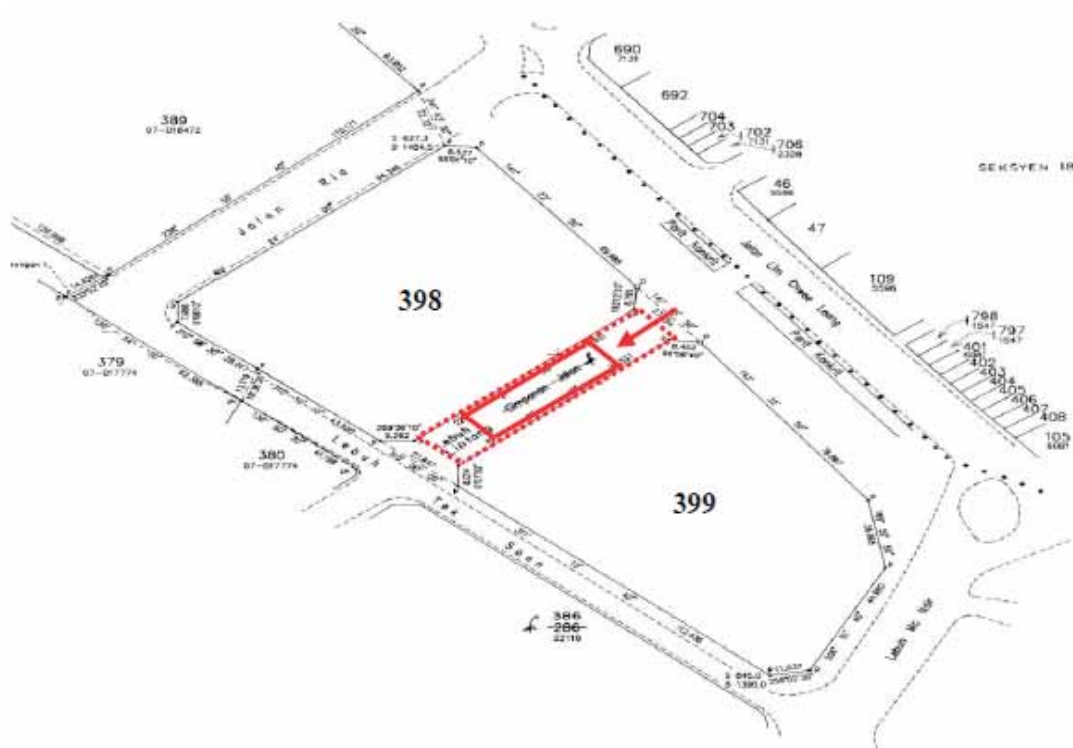


Figure 2: Cadastral map showing location of the buildings, sky bridges and basement parking

KOMTAR (Lot 400) is attached to Prangin Mall (Lot 398) and Pacific KOMTAR (Lot 389) via the sky bridges and building respectively from level two and three, which is above the public road that is Lebuhraya. On the cadastral map (Figure 3), we can see the buildings and sky bridges above surface level, located between Lot 400 and Lot 389 as well as Lot 400 and Lot 398 respectively, which is above the public road (Lebuhraya). The individual parcel owner has the recognised rights of common rights of the individual parcel in the building. On the other hand, Penang Municipal Council, the local authority is supposed to hold the recognised rights of ownership on the public road that is Lebuhraya

Soon. However, the public road that is part of Jalan Ria and Lebuhr Teik Soon was surrendered to the management corporation of KOMTAR in order to subdivide of the building.

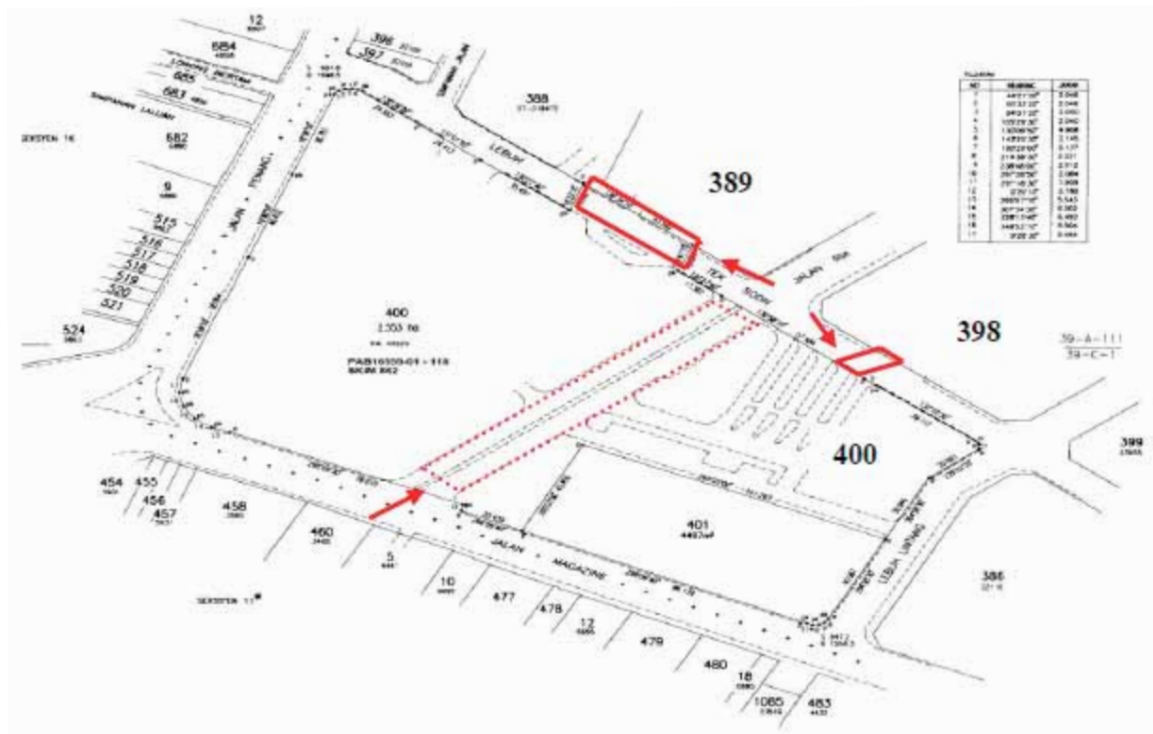


Figure 3: Cadastral map showing location of the buildings and sky bridges

10.2 Situation 2: Underground Complex in Kuala Lumpur

The Dataran Merdeka (Merdeka Square), a field fronting the Royal Selangor Club that was extensively used for cricket, hockey, tennis and rugby matches until the mid-nineties when the whole area was rebuilt to accommodate an underground parking lot, shopping area, restaurants and a complex. Beneath the square are combinations of food stalls, leisure and entertainment complex known as Plaza Putra, which contains a theatre, food court, restaurants and souvenir shops and car parks. Figure 4 shows the overview picture of the underground Plaza Putra.



Figure 4: Overview picture of Plaza Putra

The cadastral map (standard sheet) on Figure 5 shows Royal Selangor Club that is Lot 70, and the field fronting it was originally the cricket green and rugby field, which was erected on Lot 71, now with Plaza Putra, located below it. The arrow indicates the entrance to Plaza Putra of the picture taken while the dash line indicated the position of the underground Plaza Putra. The field was reclaimed by Kuala Lumpur City Hall in 1987, which holds recognised private rights of the field and developed into underground shopping mall and car park, which is owned by many individual proprietors with unrecognised public rights. National Land Code 1965 (Act 56), Section 92C and Section 92D allowed underground land under State land and alienated land being alienated, and also National Land Code (Underground Land) (Minimum Depth) Regulations 2006 had specified the minimum depth of underground land to be alienated. However, the underground land subdivision was still pending and sadly to say that currently the whole Plaza Putra is still closed for reconstruction.



Figure 5: Cadastral map showing location of the building

10.3 Situation 3: Utility Transmission Lines in Kuala Lumpur

According to Ganesan and Sreejamole (2009), a transmission line is a device designed to guide electrical energy from one point to another. It is used, for instance, to transfer the output energy of a transmitter to an antenna. The transmission line has one single purpose for both the transmitter and the antenna, which is to transfer the energy output of the transmitter to the antenna with the least possible power loss.

Figure 6 shows a transmission line across a public road. According to the Malaysian Land Law, land reserved for public roads and transmission lines are not allocated with a lot number. Local authority owns public roads in municipal areas while transmission lines are given leasehold and both hold recognised private rights. A cadastral map (certified plan) in Figure 7 shows the transmission lines across Jalan Langkawi in between Lot 27322, 27323 and 27321, Lot 27324 and Lot 27325.



Figure 6: Picture of transmission lines above public road

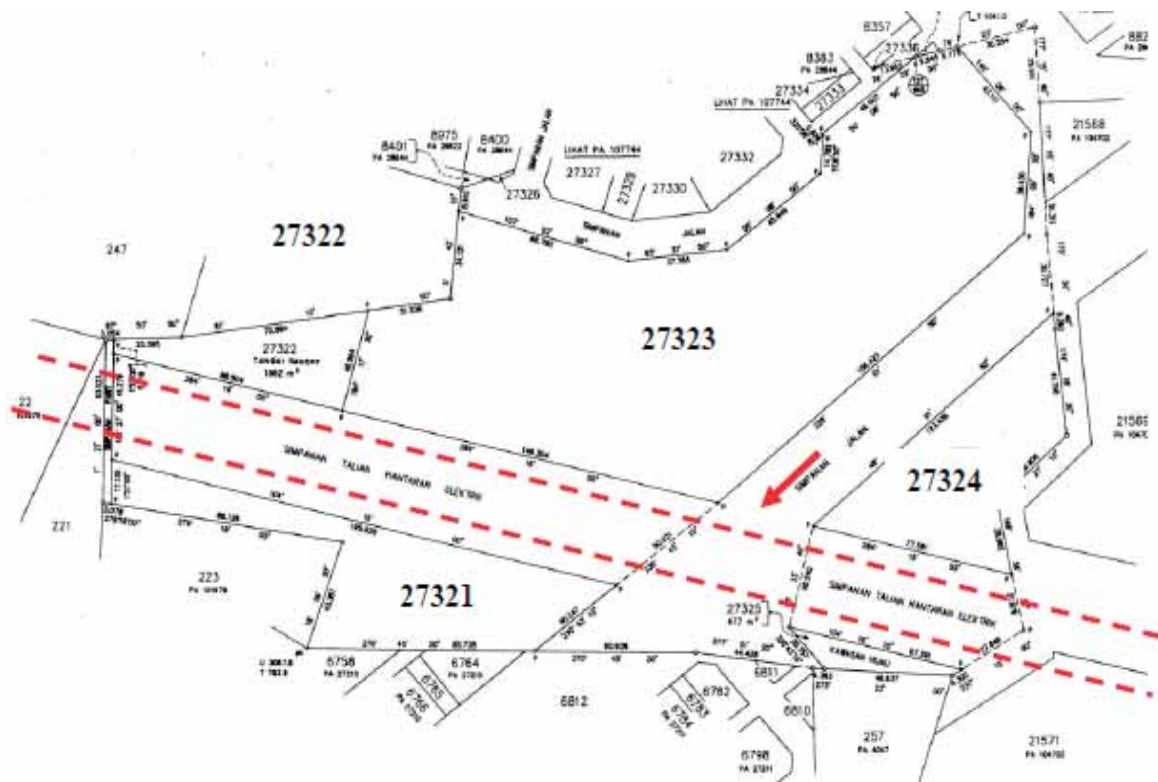


Figure 7: Cadastral map showing location of the transmission lines across public road

10.4 Situation 4: Light Rail Transit Track, Tunnel and Station in Kuala Lumpur

Rail transport in Malaysia comprised of heavy rail, light rail transit (LRT), monorail and a funicular railway line. They are for the urban public transport. The two lines in Kuala Lumpur are the Kelana Jaya Line (PUTRA LRT) and the Ampang Line (STAR LRT). Figure 8 shows certain screen on light rail transit track and tunnel.



Figure 8: Light rail transit track and tunnel

On the cadastral map (Standard Sheet) in Figure 9, Damai Station is an elevated station, which is located on a road reserve, and together with the rail track holds unrecognised private rights, which is in front of Lot 1365. This is the above ground surface track that cuts across the Ampang-Kuala Lumpur Elevated Highway, Klang River and passes through Lot 710 and Lot 836, between Lot 835 and Lot 834 (indicate in figure with red dotted line). The rail track enters a underground tunnel before going to a rail track below Jalan Ampang and

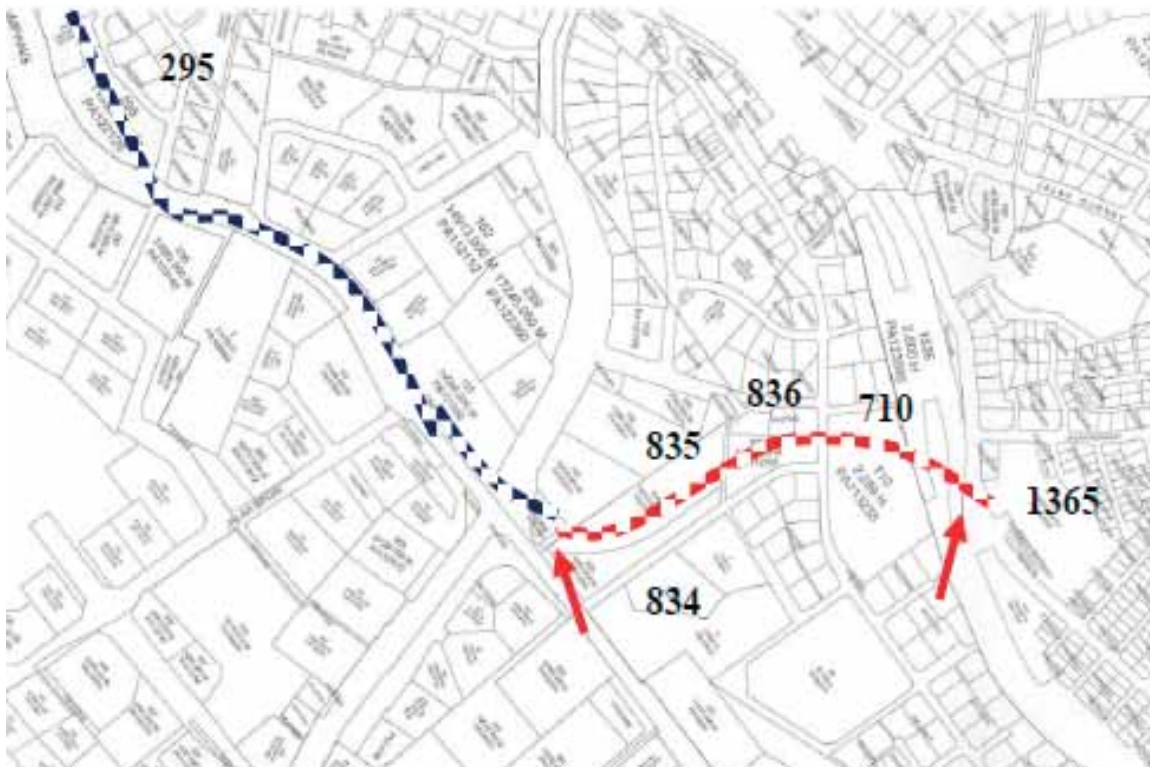


Figure 9: Cadastral map showing location of the light rail transit track and tunnel

reaching Ampang Station that is located under the road reserve in between Jalan Ampang and Jalan Binjal. The underground rail track below Jalan Ampang continues its way towards the underground KLCC Station that is located below Lot 295 (indicated in figure with blue dotted line). These situations of overlapping private rights and public rights with the rail tracks and stations hold unrecognised public rights above and below the recognised private rights of public road and land parcels. Here, the red line indicates the rail track above ground surface while the blue line indicates the rail track below ground surface.

11. SCOPE OF THE RESEARCH

This research appraises 3D property rights for multi-storey properties in mixed development areas, by using the existing cadastral legislation framework without carrying out any new technical development. The focus of my research is on these two frameworks, namely 3D property and 3D cadastre. 3D property lies on the two main forms, independent 3D property and condominium, which can be considered as the actual forms of 3D property. Meanwhile, 3D cadastre is a cadastre that registers and gives insight into rights on parcels and 3D property units. A 3D property is a bounded amount of space that a person owned real rights on a parcel. There is no any problem with respect to the third dimension because current cadastral registration is adequate to give insight into these two forms mentioned above. The problems occur in 3D property situations in which different property units or different types of land use are located on top of each other. These 3D property situations are divided into three types, namely dimension on surface, above surface and below surface for buildings, sky bridges, basement parking, utility transmission lines, transportation network and other things.

The area of research is outlined by several considerations. First, the research focused only on mainly these three types of legal documents, namely, National Land Code 1965 (Act 56), Strata Title Act 1985 (Act 318), and the Building and Common Property (Maintenance and Management) Act 2007 (Act 663). These legal documents were chosen because they require an inclusive 3D property rights to be incorporated into the current cadastral system, and also they were directly involved in the registration and cadastral survey of the multi-level properties.

Second, this research would only focus on State District Land Office, State Local Authority (Valuation and Property Management Department and/or Town Planning and Development Department), Department of Director General of Lands and Mines Office, State Lands and Mines Office, Department of Survey and Mapping Malaysia, and Licensed Land Surveyors from Penang, Selangor, Kuala Lumpur/Putrajaya and Johore. They were chosen in this study as they were directly involved in the registration, cadastral survey and processing for multi-layer properties. Finally, this research only focused on the respondents selected from senior personnel in relevant regulatory authorities and companies.

12. RESEARCH SIGNIFICANCE

In Malaysian land and cadastral legislation, the lot or land parcel can be defined as a cone with its apex down to the centre of the earth, and with surface boundaries extending vertically upwards and downwards to an extent (Chong, 2006; and Hassan 2008). As a result, the lot has become the basic unit in Malaysian cadastral survey and mapping and land registry. Lots and land parcels adjudicative aspect consists of two parts, firstly, the ascertaining of the physically surface boundaries by land survey boundary mark and secondly, the official ascertainment of rights in land via registration and issue of Document of Title. Hence, the proprietor of the lot, together with the air space and the underground land that is attached, will continue to enjoy the rights to affect dealing, subdivision, partition, amal-

gation and even subdivision of building if allowed by the State Authority (Chong, 2006). In order to make these rights practicable for the proprietor, certain current law and legal clauses, statements in certain codes and acts have to be changed, added, or cancelled if necessary.

Stratified properties, especially in mixed multi-level developments have become common, so the basis of the land and strata title arrangement are well tested. However, critical research on the problematic areas of land and strata title development in Malaysia has not been sufficient. Although research continues in universities and law related agencies, most of such studies relate only the technical aspects of the three-dimensional registration rather than the legal aspects, the studies by Chong (2006) on the legal and organisational aspects notwithstanding. The current research will attempt to examine and address some of the most problematic issues relating to the future development of multi-level building in mixed development.

13. RESEARCH CONTRIBUTION

I hope that this study will assist better understanding of the nature of 3D property rights and constitute a good contribution to the available literature in the field. Many companies, agencies and peoples would benefit from the findings of this research. The contributions to knowledge of this research are as follows: (a) For cadastral survey and mapping, and land registration practices in Malaysian Cadastral System, (b) For formal definition of 3D property rights for multi-layer buildings in mixed developments, (c) For explaining and structuring the discussion about 3D property rights by providing basic recommendations from the legislative and technical points of view in the cadastral system, and (d) For facilitating State Local Authority to increase their revenues through collection of assessment and quit rent. Furthermore, the findings and contributions of this thesis are expected to be of benefit in property-related knowledge as well as being applicable and useful to decision makers from various government authorities, professionals and housing developers in Malaysia.

14. CONCLUSION

Most traditional cadastral systems are based on registers that deal only with properties on the land surface. These systems are unsuitable for today's multi-level real properties. To cater to both above and below surface constructions and to enable the registration of real properties that are not limited to the land surface, it is necessary to amend the legislation. A three-dimensional approach for Cadastral Survey and Mapping Registration System and Land Registration System can provide a better means to manage our modern world. The existing Cadastral Survey and Mapping Registration System have a number of inherent advantages such as responsibility for proprietary rights, up-to-date information coverage and good mapping (Benhamu and Doystsher, 2003). These advantages are notwithstanding as they suffer from a number of weaknesses arising from limitations that result in their dealing only with properties on the land surface.

After reviewing several types of definitions, terms and concepts of 3D property, I strongly believe that 3D property is property with dimension above surface, dimension on surface and dimension below surface that legally delimited both vertically and horizontally. This definition includes different types of property in different legal contexts in different countries but still clearly distinguishes it from the traditional surface property. It is thus difficult to give a general definition that could be used internationally. Although 3D cadastre is more commonly used internationally and well understood by most researchers, alternatively, the term 3D property is used in this research since cadastre has more limited to taxation,

records of proprietary rights in land, providing land related information and cadastral surveying and mapping.

From the present survey, majority (57.5 %) of the respondents felt that the current land laws failed to define 3D property rights clearly. A large number (83.9%) of respondents thought that a new legislation that integrated three-dimensional aspects in cadastre registration, survey and mapping issues would address this anomaly. In this connection, government departments and agencies under various authorities are currently involved in preparing for the Cadastral System and Land Registration System in Malaysia. This is timely in view of the need for effective registration of 3D property and the improvement of the legal and technical regulations concerning 3D property rights.

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ARTICLE

Legal Comparison Between Conditional And Unconditional On Performance Bond In Malaysian Construction Contract

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ABSTRACT

In Malaysia, during the research period of 20 years since the famous case of Teknik Cepak Sdn Bhd v Public Bank Berhad [1995] 3 MLJ 449 to Suharta Development Sdn Bhd v United Overseas Bank (M) Bhd & Anor [2005] 2 MLJ 762, the question of whether the performance bond in a construction contract is a conditional or an unconditional guarantees is still one of the issues relating to performance bond that has been discussed much of the time. Therefore, the objective of this paper is to determine the phrase(s) in the Performance Bond in a construction contract that determine whether the performance bond is a conditional or unconditional on demand guarantee. In order to achieve this objective, this pure legal research was conducted by content analyzing relevant court cases. From the findings, it can be concluded that unless an undisputed meaning of the words in the performance bond to make the performance bond to be purely conditional or unconditional 'on-demand' bond, most court interpreted performance bond to be an on-demand performance bond which is only conditional upon the beneficiary asserting the basis of the claim upon the issuer of the bond contending that there has been breach of contract.

Keywords: Performance Bond, Guarantees, Conditional, Unconditional, Malaysian Construction Contract

1.0 INTRODUCTION

In construction contracts, a 'performance bond' is a bond taken out by the contractor, usually with a bank or insurance company (in return for payment of a premium), for the benefit of and at the request of the employer, in a stipulated maximum sum of liability and enforceable by the employer in the event of the contractor's default, repudiation or insolvency (Robinson et al. 1996).

There are two types of performance bonds, as set out below (Robinson et al. 1996).

- **Conditional bond or default bond.** A default bond is a contract of guarantee whereby the surety accepts 'joint and several' responsibility for the performance of the contractor's obligations under the building contract: the contractor remains primarily liable for his performance and not protected by the bond.
- **Unconditional bond or on-demand bond.** An on-demand bond is a covenant by the surety (usually a bank) to indemnify the employer following contractor's default, sub-

ject to stated terms and up to a sum commonly between 10 and 20% of the main contract sum. The contractor is not a party to this arrangement (under on-demand bond in Malaysia, subject to stated terms and up to a sum commonly 5% of the main contract sum).

However, in Malaysia, for 20 years since the famous *Teknik Cekap Sdn Bhd v Public Bank Berhad* [1995] 3 MLJ 449 to the recent *Suharta Development Sdn Bhd v United Overseas Bank (M) Bhd & Anor* [2005] 2 MLJ 762, the question of whether the performance bond in a construction contract is a conditional or an unconditional guarantees is still one of the issues relating to performance bond that been discussed This is important that the determination of the content of the performance bond will ensure whether the client can call upon the bond in the case of non-performance of the contractor or can the bank restraint the client from calling the bond. So, the phrase(s) in the bond shall be the issue of discussion.

In order to determine the types of performance bond applicable in a contract, a thorough understanding of the content of the bond is required. The Court of Appeal in the famous *Teknik Cekap Sdn Bhd v Public Bank Berhad* [1995] 3 MLJ 449 held that:

Therefore a performance bond is nothing more than a written guarantee, and in order to interpret the obligations of the bank, one need only to look at the written bond itself to determine what are the terms and conditions agreed upon between the parties. A great deal, therefore, depends on the wording of the bond itself.

As such, this paper has the objective to determine the phrase(s) in the Performance Bond in a construction contract that determine whether the performance bond is a conditional or an unconditional on demand guarantee. By clearing this issue, it is hoped that no more dispute will arise under the interpretation of the content of the Performance Bond especially in a construction contract.

2.0 PERFORMANCE BOND

Principles

Projects involve commercial risks and they involve people (Murdoch and Hughes, 2000). The following examples summarize many of the risks (Murdoch and Hughes, 2000). Some of them are contractor's risks (for example: payments; price fluctuation; etc.) and some are employer's risks (for example: workmanship; materials and goods; insolvency; etc.):

- **Physical works** — ground conditions; artificial obstructions; defective materials or workmanship; tests and samples; weather; site preparation; inadequacy of staff, labour, plant, materials, time or finance.
- **Delay and disputes** — possession of site; late supply of information; inefficient execution of work; delay outside both parties' control; layout disputes.
- **Direction and supervision** — greed; incompetence; inefficiency; unreasonableness; partiality; poor communication; mistakes in documents; defective designs; compliance with requirements; unclear requirements; inappropriate consultants or contractors; changes in requirements.
- **Damage and injury to persons and property** — negligence or breach of warranty; uninsurable matters; accidents; uninsurable risks; consequential losses; exclusions, gaps and time limits in insurance cover.
- **External factors** — government policy on taxes, labour, safety or other laws; planning approvals; financial constraints; energy or pay restraints; cost of war or civil commotion; malicious damage; intimidation; industrial disputes.

- **Payment** — delay in settling claims and certifying; delay in payment; legal limits on recovery of interest; insolvency; funding constraints; shortcomings in the measure and value process; exchange rates; inflation.
- **Law and arbitration** — delay in resolving disputes; injustice; uncertainty due to lack of records or ambiguity of contract; cost of obtaining decision; enforcing decisions; changes in statutes; new interpretations of common law.

Definition

In *Teknik Cekap Sdn Bhd v Public Bank Berhad* [1995] 3 MLJ 449, Shaik Daud JCA defines performance bond by stating:

Having considered the submissions it is relevant to find out what therefore is a performance bond. As I see it there is nothing special or unique in a performance bond. It is in fact a written contract of guarantee by a bank, other financial institutions or in some cases as insurance company, whereby they guarantee the due performance of a contract and in the event of a breach or non-performance of the contract, they guarantee to pay, on a written demand being made, the sum stipulated in the guarantee. Therefore, a performance bond is nothing more than a written guarantee, and in order to interpret the obligations of the bank, one need to look at the written bond itself to determine what are the terms and conditions agreed upon between the parties. A great deal, therefore, depends on the wording of the bond itself.

Nature of Performance Bond

A bond or guarantee is an arrangement under which the performance of a contractual duty owed by one person (A) to another (B) is backed up by a third party (C). What happens is that C promises to pay B a sum of money if A fails to fulfill the relevant duty. In this context A is commonly known as the principal debtor or simply principal; B is called the beneficiary; and C is called the bondsman, surety or guarantor (Murdoch and Hughes, 2000).

In a construction contract, performance bond is also a three-party instrument between bondsman, the employer and the contractor. The agreement, however, binds the contractor to comply with the terms of a contract. If the contractor fails to perform the contract, the bondsman assumes the responsibility to indemnify the employer up to the maximum amount of the bond. The Bondsman's obligation to pay is now arises when called upon to do so by the employer.

The obligation to pay is, however, independent of the underlying contract. This is due to the fact that the performance bond is like a letter of credit and designed to release 'no quibble' cash to the beneficiary in the event the call on the bond. This is agreed by what Lord Denning MR said in *Edward Owen Engineering Ltd v Barclays Bank International Ltd* [1978] QB 159, [1978] 1 All ER 976, [1977] 3 WLR 764, [1978] 1 Lloyd's Rep 166, 6 Build LR 1, 10 Legal Decisions Affecting Bankers 50 that:

A performance bond is a new creature so far as we are concerned. It has many similarities to a letter of credit, with which of course we are very familiar. It has been long established that when a letter of credit is issued and confirmed by a bank, the bank must pay it if the documents are in order and the terms of the credit are satisfied. Any dispute between buyer and seller must be settled between themselves. The bank must honour the credit.

Types of Performance Bond

There are two types of performance bond: conditional and unconditional or on demand. Mohamed Dzaiddin FCJ in delivering the grounds of judgment of the court in *China*

Airlines Ltd v Maltran Air Corp Sdn Bhd (formerly known as Maltran Air Services Corp Sdn Bhd) and Another Appeal [1996] 2 MLJ 517 reveal this by saying:

A bank guarantee is a performance bond. There are two types of performance bond. The first type is a conditional bond whereby the guarantor becomes liable upon proof of a breach of the terms of the principal contract by the principal and the beneficiary sustaining loss as a result of such breach. The guarantor's liability will therefore arise as a result of the principal's default. The second type is an unconditional or 'on demand' performance bond which is so drafted that the guarantor will become liable merely when demand is made upon him by the beneficiary with no necessity for the beneficiary to prove any default by the principal in performance of the principal contract.

Construction of Performance Bond

The Malaysian Superior courts have referred to and approved approach by *IE Contractors Ltd v Lloyds Bank PLC, and Rafidain Bank* [1990] 2 Lloyd's Rep 496, SI Build LR 1 in a number of cases. One of the case that the Superior Court approval of the above judgment is *Esso Petroleum Malaysia Inc v Kago Petroleum Sdn Bhd* [1995] 1 MLJ 149. Peh Swee Chin FCJ in delivering the grounds of judgment of the court said that:

That the real issue of a performance bond is one of contractual interpretation was the unanimous view of three judges in the Court of Appeal in IE Contractors Ltd v Lloyds Bank plc and Rafidain Bank [1990] 2 Lloyd's Rep 496; (1991) 51 BLR 1. It is not our intention to write an essay on performance bonds, in the instant appeal, except to repeat that it 'involves a straightforward exercise of construction, or interpretation, of the bond to discover the intention of the parties' — per Sir Denys Buckley in IE Contractors [1990] 2 Lloyd's Rep 496 at p 503; (1991) 51 BLR 1 at p 15.

3.0 CONDITIONAL VERSUS UNCONDITIONAL PERFORMANCE BOND

Methodology

This pure legal research was conducted by content analysis of relevant court cases published in the Malayan Law Journal from 1995 to 2005. There are a lot of judgments being made to distinguish whether the bond is conditional or unconditional bond. Some of them will now being reproduces the important statements from the law cases that make up the comparative analysis on the differences.

Law Cases held and cited to differentiate the conditionality of the Performance Bond by its wordings

By using the words 'Performance Bond', 67 cases for 20 years from 1995 to 2005 were downloaded from the Malayan Law Journal to be analyzed further. From the first reading and screening of the above cases, the judge of 25 cases did interpret the distinction between 'conditional' and 'unconditional' Performance Bond. Further screening was done from the 25 cases whereby only cases which the judge discussed on the wordings or phrase(s) of the Performance Bond will be further analyzed. From this, 15 cases were identified to be further consumed as follows:

Law Cases No. 1

In *Suharta Development Sdn Bhd v United Overseas Bank (M) Bhd & Anor* [2005] 2 MLJ 762, Abdul Wahab Said Ahmad JC followed *LEC Contractors (M) Sdn Bhd (formerly known as Lotterworld Engineering & Construction Sdn Bhd) v Castle Inn Sdn Bhd & Anor* [2000] 3 MLJ 339, and hold this guarantee is an unconditional on demand guarantee.

Law Cases No. 2

In *Daewoo Engineering & Construction Co Ltd v The Titular Roman Catholic Archbishop of Kuala Lumpur* [2004] 7 MLJ 136, Abdul Wahab Said Ahmad JC stated that:

I agree with the learned defendant's counsel that the Letter of Guarantee seen in isolation is payable on demand because of the presence of the no contestation clause, i.e. 'notwithstanding any contestation or protest by the contractor or by the guarantor or by any third party.'

Law Cases No. 3

In *Sime Engineering Sdn Bhd & Anor v Public Bank Berhad* [2004] 7 MLJ 475, Vincent Ng J stated that:

The area of law concerning bank guarantees is well established; in the absence of fraud, the bank is obliged to pay on the guarantee promptly on demand.

Law Cases No. 4

In *Danaharta Managers Sdn Bhd v Huang Ee Hoe & Ors* [2002] 2 MLJ 424, Kang Hwee Gee J impliedly followed Mohamed Dzaidin FCJ (as he then was) in *Government of Malaysia v South East Asia Insurance Bhd* [2000] 3 MLJ 625, held at p 636B that:

In our judgment, on its true construction this Gerenti Pelaksanaan is and unconditional bond or an on demand bond and all that is required to activate it is a written demand (Easal). It is simply a performance bond whereby the insurance company guarantees performance by the Contractor of the works under the said contract, and in the event of non performance or any breach of the terms thereof, the insurance company undertakes to pay the Government a sum not exceeding RM420,645 upon a formal demand. (Emphasis added)

Law Cases No. 5

As the previous case, in *Government of Malaysia v South East Asia Insurance Bhd* [2000] 3 MLJ 625, Mohamed Dzaidin FCJ, following Ackner LJ in *Easal (Commodities) Ltd v Oriental Credit Ltd; Banque Du Caire SA v Wells Fargo Bank NA* [1985] 2 Lloyd's Rep 546, further stated that:

Paragraph 1 is so drafted that the guarantor shall become liable merely when demand is made by the Government notwithstanding any contestation or protest by the contractor or the guarantor or by any third party. It is clear that the overall purpose of the Insurance Guarantee is for the reimbursement of the advance payment of RM1,069,035, less whatever amounts of payment made by the guarantor and deductions out of the progress payments under paras 3 and 4 upon a written demand made. In Esal, the bank 'undertake to pay the said amount on your written demand in the event that the supplier fails to execute the contract'. It was held that the latter words did not alter the fact that the moneys were payable upon a written demand. Likewise, in the present case, the words 'notwithstanding any contestation or protest by the contractor or by ourselves or by any other third party' in para 1 above, do not alter the fact that the money is payable on a written demand under and pursuant to the said Insurance Guarantee. Therefore, on its true construction this Insurance Guarantee is an on demand performance bond.

Law Cases No. 6

In *LEC Contractors (M) Sdn Bhd (formerly known as Lotterworld Engineering & Construction Sdn Bhd) v Castle Inn Sdn Bhd & Anor* [2000] 3 MLJ 339, Mokhtar Sidin

JCA referred to several cases (*Teknik Cekap Sdn Bhd v Public Bank Bhd* [1995] 3 MLJ 449, *Damatar Paints (P) Ltd v Indian Oil Corp* AIR 1982 Delhi 57, *Pesticides India v State Chemicals & Pharmaceuticals Corp of India* AIR 1982 Delhi 78, *China Airlines Ltd v Maltran Air Corp Sdn Bhd* (formerly known as *Maltran Air Services Corp Sdn Bhd*) and another appeal [1996] 2 MLJ 517, *Esal (Commodities) Ltd and Esso Petroleum Malaysia Inc v Kago Petroleum Sdn Bhd*), and therefore stated that:

From the authorities we have referred earlier it is clear to us that to determine whether a performance bond is a conditional or unconditional bond, the court should not be concerned whether there was actual breach being committed or not. It is for the parties to litigate as to whom the blame is to be placed. The court is only concerned whether on the wordings of the bond, it is an on demand bond. If it is so then the bank has to pay the person whom it guaranteed. The only exception to this is in the case of fraud which comes to the notice of the bank. As we have said earlier it is clear to us that this is an on demand performance bond. A proper demand had been made and as such the bank (second defendant) is obliged to pay the first defendant the amount stated in the bond. As to whether the plaintiff or the first defendant was at fault is not the concern of the bank. That dispute is for the parties to the contract to settle either by arbitration or by litigation in court. The bank has no choice but to pay the amount demanded. The first defendant is entitled to that sum not under the contract but under the performance bond.

Law Cases No. 7

In *Fasda Heights Sdn Bhd v Soon Ee Sing Construction Sdn Bhd & Anor* [1999] 4 MLJ 199, Steve Shim J, while referring to *Bocotra Construction Pte Ltd v A-G (No 2)* [1995] 2 SLR 733 (CA). *Esal (Commodities) Ltd & Reltor Ltd v Oriental Credit Ltd & Wells Fargo Bank NA* [1985] 2 AC 546, *IE Contractors Ltd v Lloyd's Bank plc & Rafidain Bank and Teknik Cekap*, stated that:

From the contents therein, it is clear that the plaintiff had asserted positively that the contractor had failed to execute the works under the building contract. There was also annexed to the letters of demand two certificates issued by the architect. In my view, the assertions as reflected in the two letters of demand were sufficient 'to trigger off the guarantee' (in the words of Shaik Daud JCA in Teknik Cekap) and on that basis, it is clear that the condition stipulated in the bank guarantee had been complied with and therefore the second defendant (bank) had no option but to release the monies to the plaintiff. In the circumstances, it was wrong for the second defendant to withhold or refuse to pay the monies to the plaintiff when the demand was made on the bank guarantee at the material time.

Law Cases No. 8

In *Lotterworld Engineering & Construction Sdn Bhd v Castle Inn Sdn Bhd & Anor* [1998] 7 MLJ 165, Rekhraj J referred to *Edward Owen Engineering Ltd v Barclays Bank International Ltd & Anor* [1978] QB 159 and *Re Esal (Commodities) Ltd* [1985] BCLC 450 stated that:

The performance bond was procured by the plaintiff to the first named defendant and the plaintiff was fully aware of the choice of words expressing the intention — that it was payable, notwithstanding any contestation or protest by the contractor. It would be superfluous to submit now that it was not so intended and that the payment was subject to a dispute being decided because s 94 of the Evidence Act 1950, which reads — 'when language used in a document is plain (ie unambiguous) in itself and when it applies accurately to existing facts, evidence may not be given to show that

it was not meant to apply to such facts'. The words of the performance bond are clear in the context and consistent with an immediate undertaking to pay on written demand without any protest by the plaintiff, in that, the beneficiary is entitled to forfeit the cash deposit — if such had been obtained or in the case of a bond, an advantage to immediate payment before the underlying dispute is determined either by trial or by arbitration'. This court will not therefore attribute an intention contrary to the plain meaning of the words used to attach liability towards payment upon demand.

Law Cases No. 9

In *Ramal Properties Sdn Bhd v East West-Umi Insurance Sdn Bhd* [1998] 5 MLJ 233, Kamalanathan Ratnam JC, in referring *Esal (Commodities) Ltd v Oriental Credit Ltd* [1985] 2 Lloyd's Rep 546, *Teknik Cekap Sdn Bhd v Public Bank Bhd* [1995] 3 MLJ 449 and *Esso Petroleum*, stated that:

... There was nothing there that could suggest that the demand was not proper, and for complying with the simple words there of making a claim by 'a demand in writing', the said letter was sufficiently compliant even though it was verbose.

Law Cases No. 10

In *China Airlines Ltd v Maltran Air Corp Sdn Bhd (formerly known as Maltran Air Services Corp Sdn Bhd) and Another Appeal* [1996] 2 MLJ 517, Mohamed Dzaidin FCJ (delivering the grounds of judgment of the court), after considering the cases of *Esal (Commodities) Ltd*, *Esso Petroleum Malaysia Inc v Kago Petroleum Sdn Bhd* [1995] 1 MLJ 149, *Edward Owen Engineering Ltd v Barclays Bank International Ltd* [1978] 1 QB 159 and *RD Harbottle (Mercantile) Ltd v National Westminster Bank Ltd* [1978] 1 QB 146, stated that:

In her grounds of judgment, the learned judge recognized that AC4 is an 'on demand guarantee'.

Law Cases No. 11

In *Esso Petroleum Malaysia Inc v Kago Petroleum Sdn Bhd* [1995] 1 MLJ 149, Peh Swee Chin FCJ (delivering the grounds of judgment of the court) following the case of *IE Contractors* [1989] 2 Lloyd's Rep 205 stated that:

On the type of such pure on demand performance bonds, the issuer should unquestionably pay on demand except in the case of fraud. Any argument of immediate disadvantage to the party who caused such a document to be in use is of no avail to the party who must face the risks of such unquestioned payment except where there is fraud; there was even no allegation of it, let alone any evidence of it.

Law Cases No. 12

In *Nik Sharifuddin Bin Nik Kadir v Mohaiyani Securities Sdn Bhd* [1994] 3 MLJ 551, Zakaria Yatim J, with the help of *IE Contractors* 51 BLR 5, *Australasian Conference Association Ltd v Mainline Constructions Pty Ltd (In Liquidation) & Ors* (1978) 141 CLR 335, *Jowitt v Callaghan* (1938) 38 SR (NSW) 512 and *Re Conley* [1938] 2 All ER 127, stated that:

In my opinion, the banker's guarantee is not an unconditional guarantee. In the circumstances, the court should look at the underlying contract. Clause 6(ii) of the agreement provides that the plaintiff is to indemnify the defendant against all losses where a buying client has failed to pay within the time allowed by the KLSE Rules

and where the defendant has to sell in the open market for the same securities and incurs a loss in doing so. Clause 11 provides for the termination of the agreement.

Law Cases No. 13

In *Kirames Sdn Bhd v Federal Land Development Authority* [1991] 2 MLJ 198, Zakaria Yatim J stated that:

It is clear that the above document is a guarantee given by Jerneh Insurance Corp Sdn Bhd on behalf of the plaintiff for the due performance of the contract dated 3 October 1985. The guarantee is an 'on-demand' guarantee.

Law Cases No. 14

In *Patel Holdings Sdn Bhd v Estet Pekebun Kecil & Anor* [1989] 1 MLJ 190, Wan Adnan J stated followed *Edward Owen Engineering Ltd v Barclays Bank International Ltd* [1978] QB 159 that:

All this leads to the conclusion that the performance guarantee stands on a similar footing to a letter of credit. A bank which gives a performance guarantee must honour that guarantee according to its terms. It is not concerned in the least with the relations between the supplier and the customer; nor with the question whether the supplier has performed his contractual obligation or not; nor with the question whether the supplier is in default or not. The bank must pay according to its guarantee, on demand, if so stipulated, without proof or conditions. The only exception is when there is clear fraud of which the bank has notice.

Law Cases No. 15

In *Teknik Cekap Sdn Bhd v Public Bank Bhd* [1995] 3 MLJ 449, in also referred to several cases (*IE Contractors Ltd v Lloyds Bank plc and Rafidain Bank* (1990) 51 BLR 1, *Edward Owen Engineering Ltd v Barclays Bank International Ltd & Anor* [1978] 1 All ER 976; [1977] 3 WLR 764, *Kirames Sdn Bhd v Federal Land Development Authority* [1991] 2 MLJ 198, *Esso Petroleum Malaysia Inc v Kago Petroleum Sdn Bhd* [1995] 1 MLJ 149 and *Esal (Commodities) and Relton v Oriental Credit and Wells Fargo Bank NA* [1985] 2 Lloyd's Rep 546), Shaik Daud JCA stated that:

Teknik interprets that clause to be just this — that the performance bond is an on demand performance bond and the liability to pay arises once a demand is made and the fact that the demand in this case is silent as to any wrongdoing or omission committed by the sub-contractor is immaterial to the validity of the demand as the issuance of the demand itself implies that a breach had already been committed by the sub-contractor.....

Comparative Analysis of the Law Cases

From the analysis of the case laws, it seems that most of the judges referred to the surrounding five law cases which will be discussed below to interpret whether the wording of the performance bonds are conditional or unconditional 'on-demand' bonds. The cases together with the critical comments are now being elaborated.

The first and mostly referred to be *Easal (Commodities) Ltd & Reltor Ltd v Oriental Credit Ltd & Wells Fargo Bank NA* [1985] 2 AC 546. This case gives the conclusion that there are three possible meanings for the words used in the performance bond. The first is that no more a written demand is required. The second is the demand must assert a failure to perform the contract. Lastly, there must in fact have been a failure to perform. However, most of the judge rejected the third solution. This was reflected in that part of the speech by Ackner LJ, which stated:

If the performance bond was so conditional, then unless there was clear evidence that the seller admitted that he was in breach of the contract of sale, payment could safely be made by the bank except on a judgement of a court of competent jurisdiction and this result would be wholly inconsistent with the entire object of the transaction, namely, to enable the beneficiary to obtain prompt and certain payment.

The second case is the Malaysian case of *Esso Petroleum Malaysia Inc v Kago Petroleum Sdn Bhd* [1995] 1 MLJ 149. However, after analyzing the judgment, it is seen that Peh Swee Chin FCJ in interpreting the words of the performance bond, referred to the case of *IE Contractors Ltd v Lloyd's bank plc and Rafidain Bank* [1990] 2 Lloyd's Rep 296. It is the third most referred law case for judgment.

In *IE Contractors Ltd v Lloyd's bank plc and Rafidain Bank* [1990] 2 Lloyd's Rep 296, Staughton LJ made a conclusion that there was a bias or presumption in favour of the construction that performance bond was to be conditioned upon documents rather than facts. This statement is to be compared with the next case which is the fourth most referred case.

The fourth case is also the famous Malaysian case of *Teknik Cekap Sdn Bhd v Public Bank Bhd* [1995] 3 MLJ 449. This case held that a performance bond was a conditional bond because the bond began with the words '*if the subcontractor ... shall in any respect fail to execute the contract or commit any breach of his obligations thereunder then the guarantor shall pay ...*'. However, this is the only Malaysian case that the court held the performance bond to be a conditional bond when similar wordings had been used in other Malaysian performance bond.

Last but not least, the case of *Edward Owen Engineering Ltd v Barclays Bank International Ltd* [1978] 1 QB 159. This case stressed the general nature of a performance bond that a bank is not concerned in the least with the relations between the supplier and the customer nor with the question whether the supplier has performed his contractual obligation or not, nor with the question whether the supplier is in default or not, the only exception being where there is clear evidence both of fraud and of the bank's knowledge of that fraud.

However, attention should be given as to what Steve Shin J held in *Fasda Heights Sdn Bhd v Soon Ee Sing Construction Sdn Bhd & Anor* [1999] 4 MLJ 199. He made quite good criticisms as to the wordings of the performance bond. He said that:

In my view, the words used in the bank guarantee are sufficiently clear. On a proper reading of the whole paragraph cited above, they must reasonably be construed to mean that the bank (second defendant) would be liable to release the monies to the plaintiff immediately only upon the following 'conditions' namely: (1) that the demand is in writing; and (2) the contractor fails to execute the works and/or in breach of the contract. In this context it is significant to consider the nature and effect of the 'conditions' above.

*As regards the 'condition' for the demand to be made in writing, it has been said that such a 'condition' is merely to regulate the right to call on the guarantee and is therefore purely a procedural matter. It does not render a guarantee conditional in the true sense (see *Bocotra Construction Pte Ltd v A-G (No 2)* [1995] 2 SLR 733 (CA)). I am prepared to adopt that as a correct statement of law. That being the position, the requirement to make the demand in writing in this case does not render the bank guarantee conditional in the real sense.*

*In considering the second 'condition', ie in the event the contractor fails to execute the works and/or in breach of the contract, I think it pertinent to cite the English case of *Esal (Commodities) Ltd & Reltor Ltd v Oriental Credit Ltd & Wells Fargo**

Bank NA [1985] 2 AC 546 to see how the Court of Appeal in that case dealt with a performance bond which, in effect and in substance, is similar to the bank guarantee in our case. In that case, the bond provided as follows:

We undertake to pay the said amount on your written demand in the event that the supplier fails to execute the contract in perfect performance ...

It was held that there were three possible meanings for the words used: (i) that no more than a written demand was required; (ii) that the demand must assert a failure to perform the contract; or (iii) that there must in fact have been a failure to perform. The Court of Appeal unanimously rejected the third solution. This was reflected in that part of the speech by Ackner LJ, which stated:

If the performance bound was so conditional, then unless there was clear evidence that the seller admitted that he was in breach of the contract of sale, payment could safely be made by the bank except on a judgement of a court of competent jurisdiction and this result would be wholly inconsistent with the entire object of the transaction, namely, to enable the beneficiary to obtain prompt and certain payment.

Kamalanathan Ratnam JC in *Ramal Properties Sdn Bhd v East West-Umi Insurance Sdn Bhd [1998] 5 MLJ 233* also made quite interesting statements towards the meaning of the words in the performance bond. He said that:

Clause 2(i) of the performance bond in the instant case reads:

If the contractor ... shall in any respect fail to execute the contract or commit any breach of his obligations thereunder, then the guarantor will indemnify and pay the principal

*The said cl 2(i) is virtually identical to the one used in *Teknik Cekap* and is similar to the one used in *Esal (Commodities)*. As such, I hold that cl 2(i) of the instant case renders the performance bond an on-demand performance bond which is only conditional upon the beneficiary asserting the basis of the claim upon the issuer of the bond contending that there has been a breach of contract. ...*

4.0 CONCLUSION

After discussing on the interpretation on application of injunction relief in performance bond, it is noticed that very careful choice of words should be adopted by the constructor of a performance bond so that a clear understanding of its conditionality can be achieved and undisputable.

Therefore, the choice of words again should be an undisputed meaning of the words in the performance bond. This should indicate whether the performance bond itself is either purely conditional or purely unconditional 'on-demand' bond. The best examples for this are in the cases of *Esso Petroleum Malaysia Inc v Kago Petroleum Sdn Bhd [1995] 1 MLJ 149* and *IE Contractors Ltd v Lloyd's bank plc and Rafidain Bank [1990] 2 Lloyd's Rep 296* which respectively as follows:

... we hereby unconditionally and irrevocably guarantee the payment to EPMI

We undertake to pay you, unconditionally, the said amount on demand, being your claim for damages brought about by the abovenamed principal.

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Kajian Rintis Terhadap Konsep Kualiti Perkhidmatan Dalam Membentuk Model Teori Keberkesanan Pengurusan Fasiliti Perumahan Bertingkat Di Malaysia

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ABSTRACT

Kehidupan perumahan bertingkat semakin popular di Malaysia terutamanya bagi kawasan-kawasan bandar. Namun begitu, kaedah pengurusan fasilitinya yang tidak berkesan sering menjadi isu di dalam media. Penyelidikan ini boleh dijadikan panduan bagi pihak pengurusan fasiliti perumahan bertingkat dalam mengenal pasti faktor-faktor penting yang perlu diberi perhatian serius dalam sistem pengurusan. Kertas ini membincangkan mengenai aplikasi kualiti perkhidmatan dalam membina instrumen keberkesanan pengurusan fasiliti perumahan bertingkat. Perbincangan dibuat dengan meneliti hasil-hasil penyelidikan lepas dalam mengenalpasti pembolehubah kualiti perkhidmatan yang sesuai dan boleh dipercayai untuk membina instrumen keberkesanan. Hasil ujian kebolehppercayaan terhadap 150 skim perumahan bertingkat menunjukkan semua pembolehubah di dalam instrumen keberkesanan mempunyai kebolehppercayaan yang tinggi dengan nilai pekali Cronbach's Alpha 0.8 ke atas. Ini secara tidak langsung memberi gambaran pembolehubah kualiti perkhidmatan boleh dijadikan asas dalam membina instrumen keberkesanan pengurusan fasiliti perumahan bertingkat di Malaysia.

Keywords: kajian rintis, kualiti perkhidmatan, pengurusan fasiliti, perumahan bertingkat

PENGENALAN

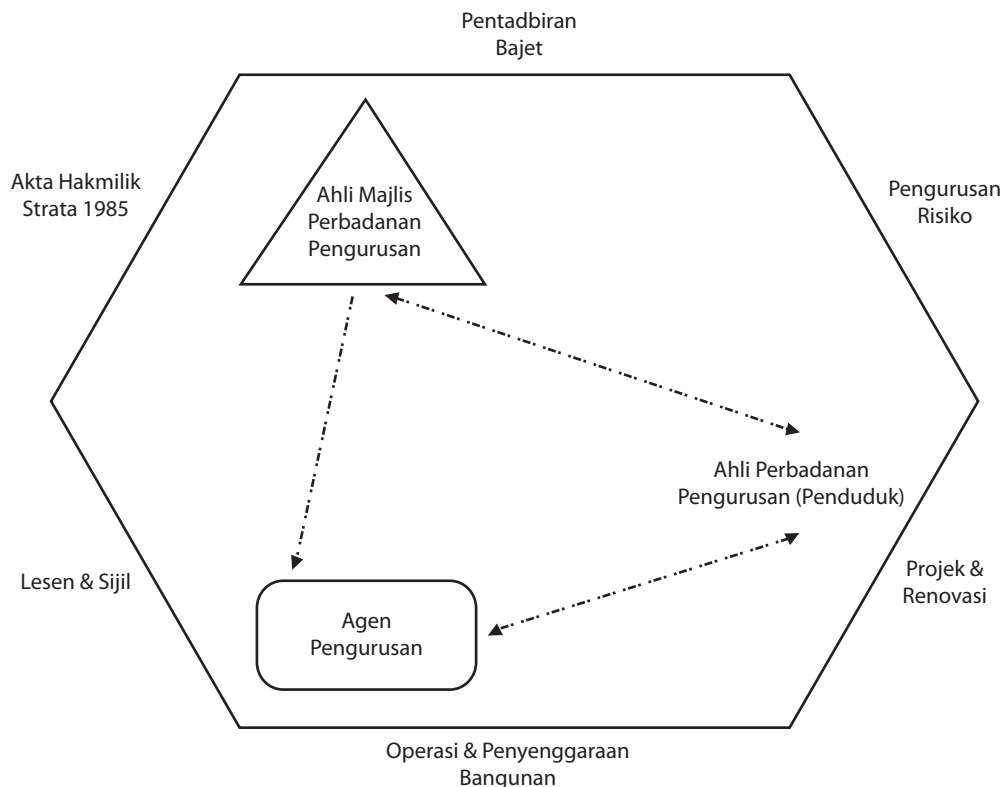
Pengurusan fasiliti wujud di semua organisasi yang mempunyai aset. Ini termasuklah organisasi Perbadanan Pengurusan perumahan bertingkat yang memiliki harta bersama sebagai asetnya. Harta bersama ini perlu diurus secara profesional dalam memberi keseimbangan terhadap keperluan pemilik yang mempunyai pelbagai kepentingan. Ini ditambah pula dengan unit perumahan bertingkat yang dilihat sebagai sebuah pelaburan serta membawa pelbagai ciri-ciri sosial dan ekonomi yang sungguh luas (Alan, 2000; Tiu, 2006).

Dalam menguruskan skim perumahan bertingkat, aspek pengurusan fasiliti harus di titik-beratkan. Secara asasnya, pengurusan fasiliti menggabungkan keperluan penduduk, harta bersama dan penyenggaraan bangunan sebagai satu elemen yang perlu diurus dengan berkesan. Pengurusan yang tidak cekap hanya akan meningkatkan kos pengurusan fasiliti (Tuti dan Abdul Hakim, 2005) yang akhirnya akan membebankan Perbadanan Pengurusan.

Bagi menentukan keberkesanan ini, aspek kualiti perkhidmatan digunakan sebagai asas untuk membentuk instrumen keberkesanan. Perbincangan kertas ini dimulai dengan melihat konsep pengurusan fasiliti perumahan bertingkat. Seterusnya, perbincangan menjurus kepada bidang kualiti perkhidmatan dan hubungannya dalam membentuk pembolehubah keberkesanan. Bagi membuktikan kebolehpercayaan pembolehubah secara empirikal, analisis kebolehpercayaan dibentangkan; dan diakhiri dengan kesimpulan.

KONSEP PENGURUSAN FASILITI PERUMAHAN BERTINGKAT

Pengurusan perumahan bertingkat di Malaysia tertakluk kepada dua akta utama iaitu Akta Pemajuan Perumahan (Kawalan dan Pelesenan) 1966 dan Akta Hakmilik Strata 1985 (AHS). Hanya bermula pada 12 April 2007, terdapat satu akta diperkenalkan dan digunakan secara bersama dengan AHS, iaitu Akta Bangunan dan Harta Bersama (Penyenggaraan dan Pengurusan) 2007 (Kerajaan Malaysia, 2007). Dalam pada itu, Pihak Berkuasa Negeri boleh mengadakan peraturan yang tidak bercanggah dengan AHS mengenai perkara yang berkaitan dengan fee, Mesyuarat Agung Tahunan Pertama (MATP), Perbadanan Pengurusan, klasifikasi bangunan kos rendah dan lain-lain. Peruntukan ini termaktub dalam Seksyen 81 AHS. Seterusnya pengurusan fasiliti perumahan bertingkat terbahagi kepada tiga sela waktu yang berbeza, iaitu sebelum pendaftaran hakmilik strata atau peringkat awalan, setelah buku daftar strata dibuka atau tempoh permulaan dan setelah penubuhan Perbadanan Pengurusan (Sapian, 2003; Kerajaan Malaysia, 2003c; Tiun, 2006; Yasmin dan Nor Azlina, 2006). Penyelidikan ini tertumpu kepada skim perumahan bertingkat yang telah mencapai sela ke-3 (setelah penubuhan Perbadanan Pengurusan) sahaja. Ini kerana pada peringkat ketiga, Perbadanan Pengurusan yang ditubuhkan adalah bersifat kekal selama mana sesuatu hakmilik strata tidak ditamatkan.



Rajah 1 : Perhubungan Pihak Terlibat Dalam Pengurusan Fasiliti Perumahan Bertingkat (Diubahsuai daripada Hui, 2005)

Seterusnya aspek pengurusan fasiliti bagi perumahan bertingkat terbahagi kepada enam, iaitu kontrak perundangan, lesen dan sijil, operasi dan penyenggaraan bangunan, projek dan renovasi, pengurusan risiko, dan pentadbiran bajet (Hui, 2005). Secara teori, pihak yang terlibat dalam pengurusan perumahan bertingkat di Malaysia menyerupai keadaan yang sama di Hong Kong, lihat Rajah 1. Perbezaan ketara adalah peruntukan perundangan yang mengawal selia skim perumahan bertingkat; dengan Malaysia tertakluk kepada AHS, manakala Hong Kong tertakluk kepada Ordinan Pengurusan Bangunan (BMO). Agen Pengurusan bertanggungjawab terhadap kepuasan penduduk secara keseluruhan kerana penduduk adalah Ahli Perbadanan Pengurusan dan pemegang syer dalam sesuatu skim perumahan. Di samping itu, sebarang kerosakan atau aduan biasanya dilaporkan terus kepada Agen Pengurusan. Menghuraikan dengan lebih lanjut, perhubungan pihak yang terlibat dalam sebahagian aktiviti pengurusan perumahan bertingkat adalah sebenarnya merupakan aktiviti pengurusan fasiliti yang dilakukan oleh Agen Pengurusan di bawah kawalan Ahli Majlis.

Apabila aspek pengurusan fasiliti diintegrasikan dalam konteks perumahan bertingkat, aspek pengguna atau penduduk perlu diberi perhatian. Merujuk kepada Rajah 1 di atas, penduduk berhubung secara terus dengan Ahli Majlis PP dan Agen Pengurusan. Keanggotaan sebagai ahli majlis sebenarnya terdiri daripada penduduk skim perumahan, sementara Perbadanan Pengurusan pula adalah dianggotai oleh semua penduduk. Untuk melicinkan perjalanan pengurusan perumahan bertingkat, maka Ahli Majlis PP perlu dilantik untuk menjalankan tanggungjawab bagi pihak Perbadanan Pengurusan (Baharuddin, 2005). Menurut AHS, bilangan minimum ahli majlis adalah tiga dan bilangan maksimum adalah tiga belas.

Setelah hakmilik strata dikeluarkan, segala fasiliti yang ada (iaitu mana-mana bahagian yang tidak terkandung dalam unit petak) disebut harta bersama. Harta bersama boleh dibahagikan kepada dua iaitu harta bersama dalam bangunan kediaman seperti koridor dan tangga; dan harta bersama luar bangunan kediaman seperti kawasan lapang, taman permainan, lanskap, jalanraya dalam skim perumahan dan rumah sampah.

KUALITI PERKHIDMATAN DALAM PENGURUSAN FASILITI PERUMAHAN BERTINGKAT

Aplikasi kualiti perkhidmatan digunakan secara meluas dalam pelbagai penyelidikan. Dengan adanya instrumen SERVQUAL, yang merupakan instrumen kualiti perkhidmatan yang boleh dipercayai dan dibuktikan melalui analisis statistik, menyebabkan banyak penyelidikan yang bersandarkan kepada bidang kualiti perkhidmatan (Zarita, 2006). Bahagian ini membincangkan aplikasi kualiti perkhidmatan dalam mengenalpasti pemboleh ubah keberkesanan pengurusan fasiliti perumahan bertingkat.

Kualiti perkhidmatan adalah suatu fenomena yang kompleks jika dibandingkan dengan kualiti produk fizikal (Parasuraman et al., 1985; Lindquist dan Persson, 1993; Gronroos, 1998; Gronroos, 2000). Perkara penting yang perlu dipertimbangkan dalam mengukur kualiti perkhidmatan adalah sifat (atau *nature*) sesebuah perkhidmatan itu sendiri. Ini kerana setiap perkhidmatan mempunyai sifatnya yang tersendiri, dan pengukuran kualiti perkhidmatan perlu mengambil kira sifat-sifat tersebut (Parasuraman et al. 1985; 1988; 1991; 1995). Dalam bidang pengurusan fasiliti, sifat terpenting yang harus diambil kira adalah konsep pengurusan fasiliti, iaitu 3P (*people, property, process*).

Apabila diterjemahkan dalam pengurusan perumahan bertingkat adalah penduduk (*people*), penyenggaraan (*property*) dan kewangan (*process*). Sifat-sifat ini menjadi konstruk utama dalam membina instrumen keberkesanan dalam penyelidikan ini. Seterusnya pengukuran kualiti perkhidmatan melibatkan dimensi-dimensi tertentu yang menggambarkan definisi

operasi bagi sesuatu pembolehubah. Dimensi-dimensi kualiti perkhidmatan seperti diberikan oleh para sarjana kualiti perkhidmatan, iaitu Sasser, Parasuraman, Gronroos dan Johnston diberikan dalam Jadual 1.

Jadual 1: Dimensi Kualiti Perkhidmatan Oleh Pelbagai Sarjana (Zarita, 2006)

Sasser (1978)	Parasuraman <i>et al.</i> (1985)	Parasuraman <i>et al.</i> (1988)	Gronroos (1988)	Johnston (1995)
Keadaan (<i>Conditions</i>)	Jelas (<i>tangibles</i>)	Jelas (<i>tangibles</i>)		Nilai estetik (<i>Aesthetics</i>) Kebersihan (<i>Cleanliness</i>) Keselesaan (<i>Comfort</i>)
Ketekalan (<i>Consistency</i>) Lengkap (<i>Completeness</i>)	Kebolehpercayaan (<i>Reliability</i>)	Kebolehpercayaan (<i>Reliability</i>)	Kebolehpercayaan dan kejujuran (<i>Reliability and trustworthiness</i>)	Kebolehpercayaan (<i>Reliability</i>) Komitmen (<i>Commitment</i>) Kebolehfungsian (<i>Functionality</i>)
Keterdapatn (<i>Availability</i>) Masa (<i>Timing</i>)	Tindakbalas (<i>Responsiveness</i>)	Tindakbalas (<i>Responsiveness</i>)	Pemulihan (<i>Recovery</i>)	Tindakbalas (<i>Responsiveness</i>) Keterdapatn (<i>Availability</i>) Prihatin dan menolong (<i>Attentiveness and helpfulness</i>)
Keselamatan (<i>Security</i>)	Keterampilan (<i>Competence</i>) Budi bahasa (<i>Courtesy</i>) Kredibiliti (<i>Credibility</i>) Keselamatan (<i>Security</i>)	Jaminan (<i>Assurance</i>)	Reputasi dan kredibiliti (<i>Reputation and credibility</i>) Profesional dan kebolehan (<i>Professional and skills</i>)	Keterampilan (<i>Competence</i>) Budi bahasa (<i>Courtesy</i>) Nilai sendiri (<i>Integrity</i>) Keselamatan (<i>Security</i>)
Sikap (<i>Attitude</i>)	Akses (<i>Access</i>) Komunikasi (<i>Communication</i>) Persefahaman/ mengenali pelanggan (<i>Understanding/ knowing the customer</i>)	Prihatin (<i>Empathy</i>)	Sikap dan tingkahlaku (<i>Attitudes and behaviours</i>) Boleh didekati dan fleksibel (<i>Accessibility and flexibility</i>)	Akses (<i>Access</i>) Komunikasi (<i>Communication</i>) Penjagaan (<i>Care</i>) Kemesraan (<i>Friendliness</i>) Fleksibiliti (<i>Flexibility</i>)

Berdasarkan Jadual 1 di atas, model kualiti perkhidmatan yang dibangunkan oleh Parasuraman *et al.* (1988), iaitu SERVQUAL diaplikasikan dalam pembinaan instrumen keberkesanan penyelidikan ini. Penyelidikan Parasuraman *et al.* (1988) berkaitan dengan pembinaan model kualiti perkhidmatan telah dimulakan pada 1985, dengan objektif penye-

lidikan untuk mengukur tanggapan pengguna terhadap kualiti perkhidmatan di syarikat-syarikat perkhidmatan dan jualan. SERVQUAL terbentuk melalui penyelidikan yang dilakukan pada 1988 dan dimensi dalam SERVQUAL diperhalusi pada 1991.

Model kualiti perkhidmatan Parasuraman terbahagi kepada lima komponen yang dikelaskan di bawah dimensi kualiti proses. Lima dimensi di dalam model tersebut seperti dinyatakan oleh Parasuraman *et al.* (1988) adalah (i) jelas (tangible), (ii) kebolehpercayaan (reliability), (iii) bertanggungjawab (responsiveness), (iv) jaminan (assurance) dan (v) prihatin (empathy). Menurut Hui (2005) yang menggunakan model kualiti perkhidmatan dalam kajiannya, penghuraian semua komponen tersebut dalam konteks pengurusan perumahan adalah seperti berikut:

- a) Jelas : Merujuk kepada keadaan aset fizikal bangunan;
- b) Kebolehpercayaan : Kebolehan untuk memberikan perkhidmatan yang dijanjikan dengan berhemah dan tepat;
- c) Bertanggungjawab: Keinginan untuk menolong pihak berkepentingan dan menyediakan perkhidmatan yang memuaskan;
- d) Jaminan : Pengetahuan dan perhatian pihak pemberi perkhidmatan dan kebolehan mereka untuk memberikan kepercayaan dan keyakinan kepada pihak berkepentingan; dan
- e) Prihatin: Menjaga dan memberi perhatian sepenuhnya kepada setiap individu yang merupakan pihak berkepentingan.

Menghuraikan lebih lanjut mengenai model kualiti perkhidmatan dan aplikasinya dalam konteks pengurusan fasiliti perumahan bertingkat, senario yang dinyatakan oleh Hui (2005) diambil sebagai contoh seperti berikut:

“Penduduk A membuat laporan kerosakan yang terdapat kelembapan pada siling rumah. Penduduk A membuat laporan melalui panggilan telefon kepada pejabat Agen Pengurusan. Penyelia bertugas menyatakan kepada Penduduk A bahawa juruteknik akan tiba di rumah Penduduk A dalam tempoh masa satu jam setelah laporan dibuat. Juruteknik tiba di rumah penduduk A dalam tempoh 30 minit. Juruteknik menjalankan diagnosis kerosakan bangunan dan mendapati punca kelembapan siling tersebut adalah daripada kebocoran paip akibat pengubahsuaian tandas yang dilakukan oleh penduduk di tingkat atas, iaitu Penduduk B. Kerosakan telah dibaiki secara sementara oleh juruteknik dengan mengetatkan sambungan paip yang bocor. Juruteknik meminta Penduduk B memanggil semula kontraktor yang membuat pengubahsuaian rumahnya supaya membuat pemeriksaan terperinci terhadap semua sambungan paip. Juruteknik turut menjelaskan kepada kedua-dua penduduk akan situasi sebenar yang berlaku. Namun, penduduk A dilihat tidak begitu berpuas hati terhadap kerosakan yang dihadapinya. Penyelia bertugas membuat tindakan susulan dengan menasihati kedua-dua penduduk supaya berbincang mengenai tuntutan kerosakan dan pampasan terhadap kerosakan siling tersebut. Satu log dibuka oleh Agen Pengurusan dan kes ini dilaporkan untuk perhatian dan tindakan selanjutnya daripada Ahli Majlis PP dalam mesyuarat yang akan datang.”

Seterusnya perkhidmatan yang diberikan oleh Agen Pengurusan dinilai dari perspektif lima dimensi model kualiti perkhidmatan. Penilaiannya adalah seperti berikut:

- a) Jelas - kelembapan siling didiagnosis dan dibaikan sementara dilakukan;
- b) Kebolehpercayaan - juruteknik menangani kes tersebut mengikut prosedur kerja berpiawai;
- c) Bertanggungjawab - dalam masa 30 minit, juruteknik sampai ke tempat kejadian dan berjumpa penduduk A;

- d) Jaminan - nasihat profesional diberikan dalam tindakan susulan; dan
- e) Prihatin - juruteknik merasa sensitif terhadap perasaan kedua-dua penduduk dan mengambil langkah lanjutan supaya penduduk berpuas hati, walaupun juruteknik tahu dia tidak boleh menyelesaikan masalah tersebut.

Merujuk kembali kepada senario di atas ia menerangkan bahawa perkara yang sepatutnya berlaku dalam aspek pengurusan fasiliti perumahan bertingkat. Selain dari itu, ia memberikan juga gambaran bahawa dimensi kualiti perkhidmatan boleh diintegrasikan dan dijadikan asas untuk mengukur keberkesanan. Atas dasar ini, instrumen keberkesanan yang dibina dalam penyelidikan ini adalah berasaskan kepada dimensi-dimensi kualiti perkhidmatan dengan mengambil kira juga situasi yang dinyatakan oleh Hui (2005) sebagai panduan. Aplikasi dimensi-dimensi kualiti perkhidmatan (seperti dalam Jadual 1) di dalam pembinaan instrumen keberkesanan penyelidikan ini dinyatakan dalam Jadual 2.

Jadual 2 : Aplikasi Dimensi Kualiti Perkhidmatan Dalam Pembinaan Instrumen keberkesanan Pengurusan Fasiliti

No	Konstruk Instrumen Keberkesanan	Dimensi Instrumen Keberkesanan	Aplikasi Dimensi Kualiti Perkhidmatan Dalam Instrumen Keberkesanan
1	Kewangan	Sumber Kewangan	Keterdapatan, Reputasi dan Kredibiliti
2		Peruntukan Kewangan	Keterdapatan, Reputasi dan Kredibiliti
3		Perbelanjaan Kewangan	Keterdapatan, Reputasi dan Kredibiliti
4	Penyenggaraan	Kualiti Perkhidmatan	Jelas, Kebolehpercayaan, Tindakbalas, Jaminan, Prihatin
5		Kualiti Keselamatan & Kesihatan	Keselesaian, Kebersihan, Keselamatan, Jaminan
6		Kualiti Penyenggaraan	Keterampilan, Tindakbalas, Jaminan, Penjagaan, Profesional dan Berkebolehan
7	Penduduk	Penyertaan Penduduk	Ketekalan, Komitmen, Masa, Tindakbalas, Prihatin dan Menolong
8		Tanggungjawab Penduduk	Ketekalan, Kebolehpercayaan dan Kejujuran, Komitmen, Tindakbalas, Prihatin dan Menolong, Budaya Bahasa, Sikap dan Tingkahlaku
9		Kepekaan Penduduk	Ketekalan, Komitmen, Prihatin dan Menolong, Sikap dan Tingkahlaku

Dari segi sumbangan kepada literatur, Williams *et al.* (1999) menyatakan bahawa kajian keberkesanan kualiti dalam sektor perumahan didapati kurang dilakukan jika dibandingkan dengan sektor-sektor lain. Sebaliknya kajian sektor perumahan banyak berkisar kepada aspek-aspek ekonomi dan kecekapan perkhidmatan. Perkara ini membuatkan pembinaan instrumen keberkesanan pengurusan fasiliti perumahan bertingkat sangat diperlukan bagi menghubungkan ruang-ruang literatur.

Kajian Tiun (2006) pula turut memaparkan bahawa hingga kini pengurusan perumahan bertingkat tidak diuruskan secara profesional dan berhadapan dengan amalan pengurusan yang tidak berkesan. Oleh itu, instrumen keberkesanan ini mampu memberikan indikator untuk menilai profesionalism dan keberkesanan pengurusan perumahan bertingkat. Keberkesanan pengurusan perumahan bertingkat perlu dicapai untuk mempertingkatkan kualiti kehidupan. Ini kerana penduduk kini mahukan rumah yang lengkap dengan pakej fasiliti, bukan hanya unit rumah semata-mata (Tiun, 2006).

KAEDAH PENYELIDIKAN

Kertas ini memfokuskan kepada analisis literatur dan analisis kebolehpercayaan sebagai kajian rintis terhadap pembolehubah yang dikenalpasti secara teori. Analisis literatur menggabungkan konsep kualiti perkhidmatan dengan aspek pengurusan fasiliti perumahan bertingkat. Melalui analisis literatur, pembolehubah-pembolehuubah dalam menilai keberkesanan pengurusan fasiliti perumahan bertingkat adalah dikenalpasti. Seterusnya, item pengukuran adalah dibangunkan bagi semua 13 pembolehubah keberkesanan.

Bagi menjalankan analisis kebolehpercayaan, satu kajian rintis menggunakan set soal selidik dijalankan terhadap 150 skim perumahan bertingkat bukan kos rendah yang terletak di Kuala Lumpur, Pulau Pinang, Selangor, Perak, Johor, Melaka dan Negeri Sembilan. Skim perumahan yang menjadi sampel adalah skim yang mempunyai Perbadanan Pengurusan yang masih aktif. Ujian kebolehpercayaan dibuat melalui pengiraan pekali *Cronbach's Alpha*, dan di analisis menggunakan perisian SPSS versi 12.01. Untuk penyelidikan ini, semua pembolehubah yang mengukur persepsi terhadap keberkesanan pengurusan fasiliti perumahan bertingkat diukur dengan menggunakan skala sela (Likert 5-mata). Pengukuran dilakukan melalui tahap kepuasan responden terhadap setiap item dalam pembolehubah.

HASIL ANALISIS KEBOLEHPERCAYAAN

Jadual 3 : Ujian Kebolehpercayaan Pembolehubah Keberkesanan

No	Konstruk Instrumen Keberkesanan	Dimensi Instrumen Keberkesanan	Aplikasi Dimensi Kualiti Perkhidmatan Dalam Instrumen Keberkesanan
1	Kewangan	Sumber Kewangan	Keterdapatan, Reputasi dan Kredibiliti
2		Peruntukan Kewangan	Keterdapatan, Reputasi dan Kredibiliti
3		Perbelanjaan Kewangan	Keterdapatan, Reputasi dan Kredibiliti
4	Penyenggaraan	Kualiti Perkhidmatan	Jelas, Kebolehpercayaan, Tindakbalas, Jaminan, Prihatin
5		Kualiti Keselamatan & Kesihatan	Keselesaian, Kebersihan, Keselamatan, Jaminan
6		Kualiti Penyenggaraan	Keterampilan, Tindakbalas, Jaminan, Penjagaan, Profesional dan Berkebolehan
7	Penduduk	Penyertaan Penduduk	Ketekalan, Komitmen, Masa, Tindakbalas, Prihatin dan Menolong
8		Tanggungjawab Penduduk	Ketekalan, Kebolehpercayaan dan Kejujuran, Komitmen, Tindakbalas, Prihatin dan Menolong, Bud Bahasa, Sikap dan Tingkahlaku
9		Kepekaan Penduduk	Ketekalan, Komitmen, Prihatin dan Menolong, Sikap dan Tingkahlaku

Hasil ujian adalah seperti dalam Jadual 3.

Kertas ini memfokuskan kepada kajian rintis yang boleh dijadikan sandaran awal dalam menilai kesesuaian pembolehubah yang dibangunkan bagi mengukur keberkesanan pengurusan fasiliti perumahan bertingkat. Secara teknikalnya, koefisien Cronbach's Alpha adalah sesuai digunakan untuk menilai kebolehpercayaan (reliability) pembolehubah. Peringkat kajian rintis ini amat penting dilakukan supaya instrumen yang dibangunkan mampu untuk mengukur perkara yang sepatutnya. Atas dasar ini, had perbincangan kertas ini hanya tertumpu kepada hasil kajian rintis yang melihat nilai koefisien Cronbach's Alpha dalam menilai tahap kebolehpercayaan pembolehubah.

Nunnally (1978) menyimpulkan bahawa nilai pekali *Cronbach's Alpha* yang melebihi 0.70 adalah dianggap sesuai dan boleh diterima. Hasil keputusan dalam Jadual 3 menunjukkan semua nilai pekali *Cronbach's Alpha* melebihi 0.80. Ini mendedahkan bahawa semua pembolehubah yang terlibat dalam penyelidikan mencapai konsistensi dalaman dan kebolehpercayaan yang tinggi. Oleh itu, dapat dinyatakan bahawa pembolehubah yang digunapakai dalam penyelidikan adalah sesuai dan boleh dipercayai, sekaligus membuktikan aplikasi dimensi kualiti perkhidmatan sesuai digunakan dalam membina instrumen keberkesanan pengurusan fasiliti perumahan bertingkat di Malaysia.

KESIMPULAN

Sejak di awal 1990-an lagi; iaitu apabila terbentuknya instrumen SERVQUAL yang dibangunkan oleh Parasuraman pada 1988, bidang kualiti perkhidmatan diaplikasikan secara meluas dalam penyelidikan pelbagai industri. Kebanyakan penyelidikan menggunakan instrumen SERVQUAL sebagai asas pengukuran kualiti perkhidmatan. Perkembangan dimensi kualiti perkhidmatan menunjukkan terdapat 5 dimensi utama dalam menilai kualiti perkhidmatan, seperti yang diberikan oleh Parasuraman. Namun dalam membina instrumen keberkesanan, dimensi kualiti perkhidmatan yang berikan oleh sarjana lain turut diambil kira, iaitu berdasarkan dimensi yang diberikan oleh Sasser, Gronroos dan Johnston.

Penyelidikan ini mendapati aplikasi kualiti perkhidmatan sesuai digunakan bagi membentuk instrumen untuk menilai keberkesanan pengurusan fasiliti skim perumahan bertingkat. Pengukuran dibuat bersandarkan konsep 3P pengurusan fasiliti, iaitu melalui konstruk kewangan, penyenggaraan dan penduduk. Pembolehubah yang dibina sebagai instrumen keberkesanan mempunyai nilai kebolehpercayaan yang tinggi melalui nilai pekali *Cronbach's Alpha* yang melebihi 0.8. Dengan ini dapat disimpulkan bahawa dimensi kualiti perkhidmatan sesuai diaplikasikan sebagai pembolehubah dalam membina instrumen keberkesanan pengurusan fasiliti perumahan bertingkat yang boleh dipercayai.

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BOOK REVIEW



Guide to Green Building Rating Systems

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Green rating tools have been gaining momentum globally and many countries have introduced new rating tools. There is now a plethora of green rating systems with different rating criteria. In certain countries such as USA, UK and Australia, there are more than one rating systems available. Investors, tenants, developers and local authorities need to understand the differences and similarities among these different rating systems. With the diversity of rating systems available, this book comes in handy for readers who would like to understand better the residential and commercial rating systems available in the USA.

This book provides an easy to read arrangement by dividing selected green rating systems found in the USA into residential (Chapter 3 to Chapter 7) and commercial rating systems (Chapter 8 to Chapter 11). The residential systems covered in this book are *Energy Star for Residential Projects*, *LEED for Homes*, *NAHB Model Green Home Building Guidelines* and *National Green Building Standard*; while the commercial systems include *Energy Star for Commercial Buildings*, *Green Globes* and *LEED for Commercial New Construction*.

A comparison is made among the residential rating systems in Chapter 1 and for the commercial rating systems in Chapter 2. The comparison is based on eligibility, market penetration, brand recognition, ease of use, compliance costs, professional designation etc. This comparison allows readers to have a better understanding of the different rating systems.

For each rating system, the aspects on eligibility, rating process, certification cost, third party verification and certification criteria are discussed. Case studies are provided as supporting examples for each selected rating systems. For residential rating system, the case studies cover a wide range of residential properties such as custom made house, prefabricated homes, production homes and multi-family high-rise as examples whilst commercial rating system has examples based on retail property, office, community centre, university and health centre.

This book explained clearly each of the selected rating system and is organized to allow the reader to find the information they wanted easily. It aims to help the reader to choose a suitable rating system for their projects. Overall the format of the book is easy to read and well-illustrated with photos, tables and figures.

The weakness of this book is the lack of a list of comprehensive references that could provide a guide to further readings. The references at the end of each chapter are mostly web-links and websites; there are few references to other journal articles and books.

Overall, this book serves as a good introduction and guide to some selected popular residential and commercial rating systems in USA. This book provides the foundation for readers to understand the components of the rating systems.

It is not uncommon for the established and popular rating systems in one country being applied on buildings in other countries. This necessitates comparisons among international rating systems. However the international rating systems e.g. BRREAM, CASBEE, Green Star, HK-BEAM, SBTool etc. are discussed only briefly in this book. A detailed comparison of international rating systems would add value this book.

Notes for Contributors

International Surveying Research Journal (ISrJ)

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Full paper submission should consist of a file in Microsoft Word format attached to an e-mail message.

Format of Full Papers

Language

English and Malay

Content

Full paper should include title of paper, author details, Abstract, Keywords, and References.

Paper Length

Full paper should not be more than 20 pages, including all text, graphs, tables, diagrams, maps, pictures, illustrations, and appendices.

Paper size

Set paper size to A4. The lines of text (except the text under Abstract) should be intended left and right 3cm from the paper margin.

Text font

Times New Roman

Abbreviations

No full stop is needed for titles, names, acronyms, and measurement units: eg, Mr, Dr, PRC, UK, ISM, Jan, Feb, Mar, 4m, 5ft.

Abstract

Must be in English

Abstract in bold, full caps, 12 point size, and centered. On the next line, type the content of the Abstract in 10-point size, indent 3cm on margins, left and right justified.

Abstract should be in single paragraph outlining the aims, scope, and conclusion of the paper. It should be no more than 300 words in length.

Keywords

Drop 2 line spaces and type KEYWORDS in bold, full caps, 12-point size, and left justified. Type the keywords in the next line and indent 3cm on both margins, left and right justified. Suggest approximately 5-10 keywords spaced by commas.

Main Text

Drop 2 line spaces before typing each of the above topics. The text should be single spaced, single column, indented 3cm on margins, left and right justified, and 12-point size. Paragraphs should not have any indentations. Any abbreviations used should be defined.

Section headings are in bold and full caps. There should be no blank lines between the heading and the first line of text. Separate paragraphs in each Section with one blank line. There should be two blank lines before each Section.

Equations should be centered, with a spaced line above and below. Equation font size should be the same as that of the text. Use only those mathematical symbols supported by Microsoft word.

All graphs, tables, diagrams, maps, and other illustrations should be in black and white. They should be labeled and embedded in text as close as possible to where they are first cited.

References and table headings should appear above the table. Tables are to be centered on the page. Leave one

blank line before the table heading and one blank line after the table.

Illustrations are to be centered, with the reference and caption printed below the figure. Footnotes should appear at the bottom of the page where they are cited, numbered and in 10 point size.

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Drop 2 line spaces and type REFERENCES in bold. All references should be in 12-point size, left and right justified, intended 3cm on both margins for the first line and 3cm on the left margin for subsequent lines. List all bibliographical order by the last name of the first author at the end of the paper in the following format:

Journals

Last name and initials author(s), (year of publication), paper title, journal volume: issue, page numbers, for example:

Stewart R (2001), the Spatial Data Infrastructure: Concept, Prototype Development and Future Direction, GIS -Today and Tomorrow, 28:2, 155-177.

Books

Last name and initials of author(s), (year of publication), book title (italics), edition (if any), publisher, for example:

Blachut CD (1979), *Urban Surveying and Mapping*, Springer-Verlag, New York.

Chapters in books

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