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Assessment of High-Rise Residential Building's Quality In Handover Vacant Possession Process (Kuala Lumpur)

Purchasers of properties encounter numerous problems, especially building defects on the main building elements; whenever vacant possession is delivered to them by developers. Besides that, public wonder is there building quality assessment to be a guideline for them to inspect their properties while taking the completed property from the developer. The aim of this research is to assess building construction quality in the handover vacant possession process through purchasers and professions expectation which included the need of professions to play their role in pre-handover, during handover and post-handover vacant possession process. Besides that, this

research is also study on quality assurance assessments which are practicing in Malaysia. It is within the scope of the existing buildings in Malaysia (Kuala Lumpur) which is in the process of handing over to the purchasers. Questionnaires were distributed to each case study and feedback from the respondents were gathered. Analyzing data will provide an in view of the criteria to be considered by the purchaser while selecting the property to be purchased, the defect(s) in the unit during the handover the vacant possession period and the awareness of the respondents on the Building Quality Assessments in Malaysia. It is anticipated that this study would contribute to the property development of a better building quality product to be constructed and to raise the awareness to the building quality assessments in Malaysia.

Keywords: Building's quality, Building quality assessment, Handover vacant possession process.

1.0 Introduction

In Malaysia, there are some well known building quality assessments to measure or evaluate every construction project and each assessment with their own evaluates aspect. They derive the score based on a systematic testing that involves architectural, structural, mechanical and electrical random testing carried out by different teams throughout the construction period.

During the Defects Liability Period (DLP), the developer is responsible for what the further defects which owners find in the vacant possession after taking it. However, the expectation on defects between developer and purchaser is not the same. Therefore, purchasers dubious of the quality of the properties and require the need of experts or professionals certification on the quality and safety of the properties before or after taking over the vacant possession.

This study is used to provide insight into the building condition and quality inspection assessment, as well as professional expert's perspective on

the quality assurance on building constructions.

2.0 Problem Statement

Purchasers of properties encounter numerous defects in the vacant possession when they take over from the developer, even if they are "three (3) high" properties which are "high rise", "high end" and "high price". A lot of people do not know that the building condition survey is important for those who want to buy a property, either new or old assets before and after the handover of vacant possession. Here is an argument of the need of a professional to allocate into this process. Besides that, the public need to be introduced the relevant building quality assessments which can strengthen the professions issued certificate.

3.0 Aim and Objectives of Research

The aim of this research is to assess building construction quality on the vacant possession during the handover and

post-handover process, with referring to the quality assurance assessments in Malaysia and the defects rectification efficiency during DLP from chosen case studies. The purchasers and professionals comments would be taken for consideration on the building quality and the need of professions to play their role in the process. In completing this research, following objectives are needed:

- a) To understand the building construction quality assessments and their practice on building construction quality during handover of vacant possession in Malaysia.
- b) To identify significant relationship between the occupants and building defects toward efficient vacant possession handover process.
- c) To propose handover inspection checklist (HOIC) and procedure for vacant possession quality assessment.

4.0 Definition of Quality

Quality may mean different things to different people. Some take it to represent customer satisfaction, others interpret it as compliance with contractual

requirements, yet others equate it to attainment of prescribed standards. The International Organization for Standardization (ISO) formally defines quality as the 'total of characteristics of an entity that bear on its ability to satisfy stated or implied needs' (ISO, 1994a). Dr. J. M. Juran, an international authority on quality management, perceives quality simply as 'fitness for purpose'. Indeed, a product befitting its intended purpose would satisfy the user's need and expectations. The crucial point lies in making the purpose clear to all parties involved in the design and production.

The quality of building works is difficult and often impossible to quantify since a lot of construction practices cannot be assessed in numerical terms. The framework of reference is commonly the appearance of final product. 'How good is good enough?' is often a matter of personal judgment and consequently a subject of contention. In fact, a building is of good quality if it will function as intended for its design life. So far as the builder is concerned, it is fair to judge the quality of his work by the degree of compliance with stipulations in the contract, not only the technical specifications but also the contract sum and the contract period. His client cannot but be satisfied if the construction is executed as specified, within budget and on time. Therefore, a quality product of building construction is one that meets all contractual requirements (including statutory regulations) at optimum cost and time (H.W.Chung, 1999).

In the construction industry, ISO 9001 is suitable for companies that are engaged in design and construct projects. However, the majority of building contractors work to a design supplied by the architect/ engineer, and their quality system may be modeled on ISO 9002. In fact, ISO 9002 is a sub-set of ISO 9001 without the requirements on design control. Consequently the quality system of a building construction company should conform to either ISO 9001 or

All of the owners should have a guideline or checklist as their reference during their handing over process.

ISO 9002, depending on whether design of permanent works forms part of the company activities (H.W. Chung, 1999).

5.0 Process Control and Inspection/ Testing

Process control is closely linked with inspection/testing. While process control prevents sidetracking of the established procedures, inspection / testing verifies that the required quality is actually obtained. To make the process control effective, every witness point in an inspection and test plan should be observed and work should not proceed beyond a hold point without approval by the authorized person (Donald Friedman, 2000).

Inspection and testing required for a project should be indicated in the project quality plan. On a construction site, inspection and testing is carried out at three stages:

- a. on receipt of purchased or subcontracted items or service;
- b. during a construction process in which an in-process check is con-

- ducted before proceeding to the next step; and
- c. before final delivery or handover of the finished works.

During construction, inspection and testing should be carried out progressively to ensure that any defective work is not built upon or covered over. The requirements for in-process inspection and testing are usually documented in the inspection and test plans (ITPs) which form part of the quality plan. An ITP lists in sequence the activities involved in a process, specifies the checks or tests to be performed and the acceptance criteria, indicates the hold points when verification of quality is a prerequisite to continuation of work, and identifies the authority of approval at each hold point (Donald Friedman, 2000).

6.0 Corrective and preventive action

With in-process inspection and testing properly and conscientiously performed, it should be able to discover any nonconformity as soon as it exists. The nonconforming work should be reviewed as soon as possible after it is detected. In the review process, the extent of nonconformance and its bearing on the quality of the finished works as a whole are evaluated. The review is conducted by a person who has executive power to take corrective action, this person is normally the project manager or the site agent, but for minor nonconformities the general foreman may act with delegated authority (Harrison, 1931).

In the course of reviewing nonconforming work, or handling a client complaint, the cause of the incident and the situation leading to it are usually revealed. A construction activity might have deviated from the contract drawings/specifications or the workmanship might have fallen short of the specified or implied level of standard. Corrective action is necessary to eliminate the cause do as to avoid recurrence of the untoward event. This

may involve amending a documented procedure or work instruction, providing additional resources or training the operational staff. In contemplating the appropriate action, account should be taken of the magnitude of the problem and the risks involved (Harrison, 1931).

7.0 Building Construction Quality Assessment in Malaysia

In this research, the most building quality assessments for properties in Malaysia have been used, which will be studied in detail for the method of assessment, person involved in the assessment and any information about the building's quality assessment. There are three (3) Building Quality Assessment Systems that have been studied in this research as per stated below:

- a) Construction Quality Assessment System (CONQUAS);
- b) Quality Assessment System for Building Construction Work (QLASSIC); and c) Building Performance Assessment. CONQUAS was developed by the Building and Construction Authority (BCA) and introduced in 1989 in conjunction with the major public sector agencies and the various leading industry professional bodies to measure the quality level achieved in a completed project.

QLASSIC was developed in November 2006 by CIDB's Technical Committee (TC) that comprises of representatives from Public Works Department (PWD), Jabatan Perumahan Negara (JPN), Real Estate and Housing Developers Association (REHDA), Pertubuhan Akitek Malaysia (PAM), Master Builders Association Malaysia (MBAM), National House Buyers Association (HBA) and other relevant organizations.

To maintain the standard of works for new building works projects and

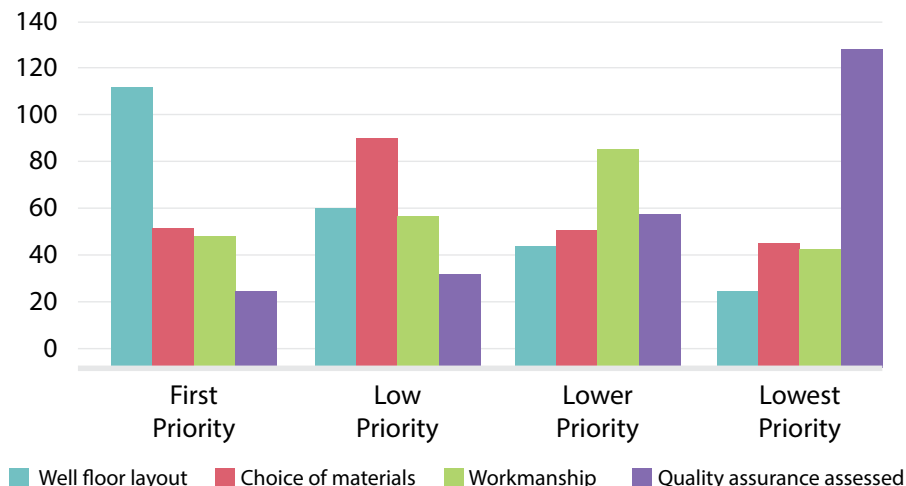


Figure 1: Criteria that the purchaser considered most before purchase/rent a house.

maintenance projects, Hong Kong Housing Authority have developed the Performance Assessment Scoring System (PASS).

8.0 Research Methodology

There are two types of research methodologies; which are quantitative methodologies and qualitative methodologies. Both methodologies will be used during the research. Qualitative research involves the use of qualitative data such as interview, direct observation, survey and analysis of documents and material. Questionnaire survey and documents review are the research method used for the major defects that have been found and the need of the Building Quality Assessments to the brand new property during the handover vacant possession period. These research methods are important to gather information such as user's preferences, opinions and suggestion.

There were five (5) case studies that have been chosen to carry out the questionnaire survey. These case studies have been chosen because all of them were assessed according to the Building Quality Assessments by the related association. Therefore, each case study

distributed 50 questionnaires which prepare for the residents of the case studies and one of the members of each unit to answer for one questionnaire sheet. There is a total of 250 responds in the survey. All of them are considered as high-end condominiums which are located in the Mont'Kiara area in Kuala Lumpur. For the interviews of the professionals, there consisted of consultant of building quality inspector, personnel of quality department of the developer from private company.

9.0 Result and Discussion

Criteria to be considered by the purchaser

Figure 1 in the appendix showing that most of the residents of case studies chose "Well Floor Layout" as the first priority criteria. If the floor layout is well design and fully utilize the area of the unit, the buyers may not need to spend much money to carry out the renovation works, and even not carry out at all.

"Choice of Materials" is the low priority criterion. In their view, good quality material would ensure to produce good quality product. They believed that a good quality product would minimize

the possibility of occurrence of building defects and would be durable for longer period.

The lower priority criterion chosen by most of the residents of all case studies is "Workmanship". The poor workmanship would not guarantee the product quality; even the best quality of materials to be used. The workmanship can only be seen when the building or the house had been constructed completely. The purchasers can only refer to the previous projects which were built by the developer or the contractor; or even gain the opinion from the buyers.

For all case studies, most of the residents respond that the "Quality Assurance assessed" is lowest priority to be considered for buying a property. In their opinion, they would not know the "marks" to be given. Therefore, it does not help at the time of purchasing a property. However, some of the purchasers claimed that the quality assurance assessment would encourage the purchaser when buying a house. It would be the addition points to the property which potentially to be bought.

The defect(s) in the unit during the handover the vacant possession period

During the handover inspection, the purchaser can only carry out an overview visual inspection which can only spot or notice the buildings defects with the naked eye.

Based on the data (Figure 2), we could summarize the top five (5) building defects which were faced by the purchaser during the handover of vacant possession period:

a) Rusty of Ironmongery

Most of the purchasers claimed that there were rusty of ironmongery on the doors, windows and fittings in the unit. The defect is likely due to poor storage management

of the materials and also improper protection work to the ironmongery which were installed. Therefore, some of the contractor installing the ironmongery at the final stage of the construction period to avoid the ironmongery exposed to the weather and deteriorate before the handover period.

b) Uneven Ceiling

The purchaser claimed that they would view on the ceiling, wall and floor of the unit when first to the unit. Therefore, if there is unevenness on the ceiling soffit/surface, especially concrete ceiling, with the reflection of the sunlight, the defects would be very obvious to be seen. It would be an esthetic issue when the installation of lights or lamps on the ceiling, the reflection of the light will cause the ceiling to become "wavy".

On the professions view, The evenness of ceiling soffit/surface is affected by the workmanship of plastering and skimming works to the ceiling. However, it is impossible that the ceiling would be smoothed with no single waviness. Therefore, they would refer to the Building Quality Assessment guidelines to ensure that the quality of the product is up to the standard within the tolerant.

c) Defective of Sanitary Fitting

There were many defects that could happen on the sanitary fitting and appliances. It could be chipped, scratches and broken on the appliance, improper sealant works at the joint of the fitting and caused water leakage, stain marks left on the appliance during the construction period, cistern not functioning, and even missing items. It is likely due to poor workmanship to the installation of the

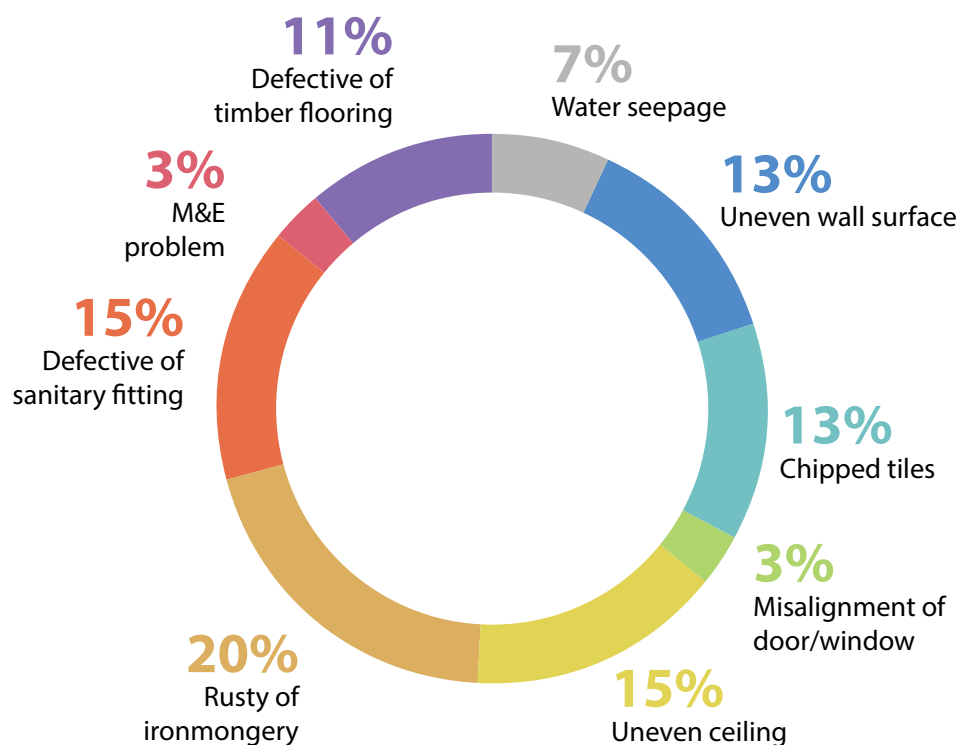


Figure 2: The defect(s) in the unit during the handover the vacant possession period.

sanitary fitting, storage management and lack of protection to the appliance or fitting after installation on site.

d) Uneven wall surface

Walls could be considered the main building elements of a property. The residents also concern on the evenness of the wall. As per professions view, they claimed that the evenness of wall is affected by the workmanship of plastering works to the wall. Therefore, wall plastering needs to be carried out by a skill worker.

e) Chipped tiles

Nowadays, most of the floor and wall finishes would be laid by ceramic tiles, homogenous tiles and even stone materials such as marble or granite. Chipped floor or wall tiles may be caused by the poor workmanship of handling the materials during the delivery, storage and installation works. Lack of protection to the laid tiles on the construction site would also cause the defective tiles.

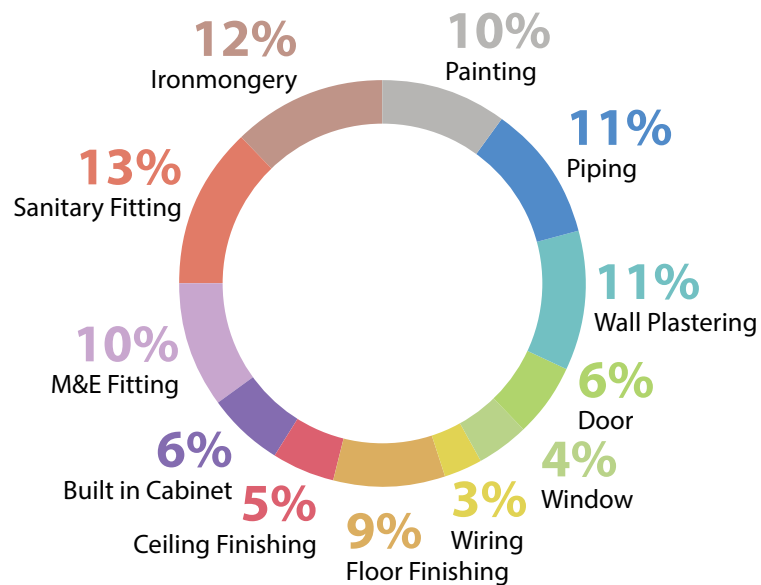


Figure 3: Defect(s) on the building elements after handed over unit.

Defect(s) on the building elements after handed over unit.

From the case studies (Figure 3), it could be summarized the top five (5) building elements which were always facing latent defect problems by the purchaser after the handover of vacant possession inspection.

a) Sanitary Fitting

The defects on the sanitary fitting could only be discovered after being used for a period. There were water leakages and appliance not functioning. The defects are likely due to poor workmanship of installation works. The fitting were not installed properly and the joint of the fitting were not sealed properly. For the mechanism problem, it would be the manufacturing issue.

From the developer and contractor view, they commented that some of the faulty sanitary fitting is caused by the users. They did not follow the user manual instruction and do not know the way of handling the new types or new style equipment.

b) Ironmongery

When the owners occupy the unit, they would notice more ironmongery defects of the unit, especially for the ironmongery which were exposed to the weather may speed up the deterioration progress.

c) Piping

The residents claimed that most of the defect on the piping is clogged water outlet and water leakages at the joint. The defect is likely due to poor workmanship during the construction period. Therefore, the site supervisors have to inspect and test all the piping works.

d) Wall Plastering

From the survey, most of the owner facing the plaster/crazing cracks problem on the wall plastering of their units. The hairline plaster cracks could be attributed to plaster shrinkage as a result of the continuous wetting and dry circle of the plaster works. Plaster like all forms of cementitious materials absorbs moisture from the ambient, particularly during rainfall or form water streaming

The International Organization for Standardization (ISO) formally defines quality as the 'total of characteristics of an entity that bear on its ability to satisfy stated or implied needs' (ISO, 1994a).

down the face of the wall. The trapped moisture would eventually dry out on its own. This continuous wetting and drying cycle would eventually cause shrinkage to occur within the plaster works, resulting in hairline plaster cracks as observed on the wall.

e) M&E Fitting

There were incidents of air-conditioning split unit water leaking, malfunction of water heater and other similar defects on the M&E fitting which were facing by the owner. All these M&E defects could be discovered when the equipment has been used frequently after the occupants move in the property. The defects may likely be due to the poor workmanship of installation or mechanism issue.

10.0 Awareness of Building Quality Assessments

Figure 4 shows that the awareness of the property buyers to the Building Quality Assessments in the property industry in Malaysia. There were three (3) Building Quality Assessments had been selected. They are:

- I. Construction Quality Assessment System (CONQUAS) from Singapore;
- II. Quality Assessment System for Building Construction Work (QLASSIC) from Malaysia;
- III. Building Performance Assessment (PASS) from Hong Kong

Based on the survey, the most well-known building quality assessment is Construction Quality Assessment System (CONQUAS), from Building

and Construction Association (BCA) Singapore, which is about 80%. At the time of purchasing the property, the developer would promote that the property would be assessed by the CONQUAS, to ensure that the quality of the buildings up to standard. In their view, CONQUAS is a guarantee to the good quality of the property. The professionals also claimed that CONQUAS has been practice in the building industry for a long period.

BQA is Quality Assessment System for Building Construction Work (QLASSIC) from Construction Industrial Development Board (CIDB) Malaysia, which was only 18% of the residents come across this building quality assessment.

In the beginning stage when QLASSIC was introduced in Malaysia, most of the developers were still using CONQUAS as their guideline. Up until these few years, QLASSIC had been commonly practicing and assessing in Malaysia, it becomes more developers choose to use QLASSIC instead of CONQUAS.

There were only few of them had ever heard about PASS which was introduced in some of the property relevant internet websites (2%). Therefore, PASS not even has not been generally introduced in our country, but also not so well-known in Hong Kong.

11.0 Conclusion and Recommendation

All of the owners should have a guideline or checklist as their reference during their handing over process. To achieve the research objective, herewith

recommendation of the building quality survey procedure for the property owners.

- i. The property owner should prepare a layout plan to their own unit. The layout plan could be copied from the Sale and Purchase Agreement. The layout plan let the owner understand the orientation of the units and mark out all the detected defects on the layout plan as reference.
- ii. The inspection should be carried out by location basis, such as Living Room, Master Bedroom, Kitchen, and Common Bathroom.
- iii. When it comes to a location, the survey should start from the main building elements which is floor, wall and ceiling. When walk along these building elements, the surveyor should follow clock wise and carry out the inspection by visualization. If need, tapping and touching need to be done to ensure there were no hollowness on the building elements.
- iv. While the defects were detected, mark on the layout plan the location where you detected the defects and record down the defects type and the building elements. For example: Two (2) fine cracks on the wall and chipped floor tile. Photographs of the defects could be captured if necessary for record purpose. The photographs could be compared after the rectification work is done.
- v. The owner should test or turn on all the sanitary fittings and M&E equipment to ensure that all of the fittings and equipment are functioning well. Normally there are no lamp installed in the unit. Therefore the owner could bring along a torchlight to inspect the dim areas such as storeroom or bedroom.
- vi. The owner could give a copy of the layout plan to the developer or contractor and keep one copy for record. The owner could refer the previous record to inspect the work done after the rectification,
- vii. If there are some defects which the owner could not identify or confirm,

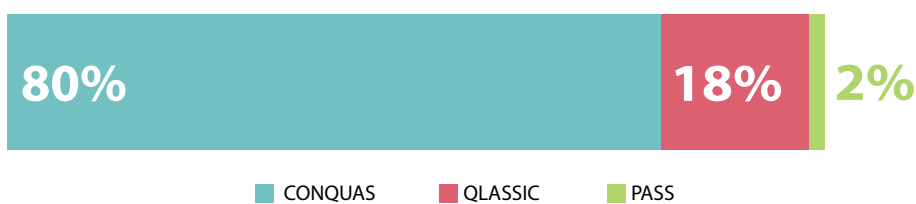


Figure 4: Awareness of Building Quality Assessments

they can refer to the building quality assessments as their guideline for the minimum requirement and tolerant.

The proposed Building Handover Inspection Checklist (HOIC) could be referred as per attached. Based on the research, the existing Building Quality Assessments (BQA) such as CONQUAS and QLASSIC are well organized and complied, especially QLASSIC, which has included more sections and elements than CONQUAS. However, there were some parts of the BQA are too general and no specific defects can be referred to a certain building elements.

Besides that, the existing BQAs would only be used by the person who is

Based on the research, the existing Building Quality Assessments (BQA) such as CONQUAS and QLASSIC are well organized and complied, especially QLASSIC, which has included more sections and elements than CONQUAS.

Table 2: Building Handover Inspection Checklist

No.	1st Inspection			2nd Inspection		Remarks
	Location	Description of Defect	Photo No.	Done	Not Done	
1.	Main Entrance	Floor				
		Wall				
		Ceiling				
		Other				
2.	Foyer	Floor				
		Wall				
		Ceiling				
		Other				
3.	Living Room	Floor				
		Wall				
		Ceiling				
		Other				
4.	Master Bedroom	Floor				
		Wall				
		Ceiling				
		Other				
5.	Bedroom 1	Floor				
		Wall				
		Ceiling				
		Other				
6.	Common Bathroom	Floor				
		Wall				
		Ceiling				
		Other				

practicing in the building construction industry and only the relevant person would understand the BQA. Therefore, there are recommendations to produce a simple BQA which can be used by a "layman", especially the property owners, to understand and use the guidelines as their references. ▽

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End Users Perception On The Issues Pertaining To The Current Malaysian Standard Method of Measurements (SMMs)

Standard Method of Measurement (SMM) is a standard document that is localized in order to fit with our local custom and practice thus allows standardized measurements that provide a base to produce a good procurement or contract document. In other word, SMM is needed in producing a good Bills of Quantities (BQ) which is used as procurement or contract documents in a project. In recent years, numerous studies have been conducted to assess its applicability and many without doubt have recognized its significance in the construction process. Despite this recognition, reviews of the literatures have suggested that the SMM is flagged with issues which rendered it to be inappropriate content, format and approach, not fully utilize by the key players

thus leading to inconsistency in BQ. Empirical evidence from past researches have justified the presence of the issues, however without any coordinated effort in drawing the desired solution, the issues remain daunting and continue to become an academic and industry-wide concern. In view of the above matter, this paper is prepared to analyze the perception of the end users regarding the issues pertaining to the current Malaysian SMMs'. An exploratory semi structured interview and formal group discussion approach was conducted among the selected end users that encompassed their opinion, perception, critical issues and problems regarding the current Malaysian SMMs as well as their suggestions to respond to the problems or issues identified. The findings had confirmed on the issues rose from the literature review and had provided an insight of real current issues and problems clutch our Malaysian SMMs. The current situations identified would be assessed as one of the prerequisite step in suggesting the desired solution in order to make an adjustment on the current SMM to the items and terminology to reflect the Malaysian construction practices. The outcome of this paper is expected to be used as a supporting and fundamental data to be carried along to the next level of the main research which aims to develop a more accepted and practical Standard Method of Measurement for construction works in Malaysia.

Keywords: Bill of Quantities, Construction Cost Management, Standard Method of Measurement (SMM)

1.0 Introduction

Quantity Surveyors (QS) generally offer its clients a wide range of professional services from contractual matters to costs estimation, evaluation and control. Preparing a Bill of Quantities (BQ) is one of the core services provided by the QS for the purpose of project cost control and management (Abd Rashid, Mustapa, & Abd Wahid, 2006; Abdul Aziz & Ali, 2004). BQ is a document containing a detailed list of works and the quantities required for a building or other civil engineering project used during pre and post contract stages (Adnan, Mohd Nawawi, Mohd Akhir, Supardi, & Chong, 2011; Brook, 1998; Peter R. Davis, Love, & Baccarini, 2009) Through Bills of Quantities, needs and requirements of the

clients will be transform from drawings, schedule and specification produce by the architects and Engineers into a tender document which are fully described and accurately represented, the quantity and quality of the works (Abd Rashid, 2011; Abd Rashid et al., 2006; Abd. Latif, 2010; P. R. Davis & Baccarini, 2004; Kamaruddin, 2010; Myles, 2006; Razali & Abd Rashid, 2011)

In order to produce an appropriate BQ which is properly measured, determined and quantified (Mohd Din, 2009), a Standard Method of Measurements (SMMs) protocol has been developed and used. The Standard Method of Measurement for building works (SMM2) and Malaysian Civil Engineering Standard Method of Measurement (MyCESMM) are amongst the current standardized references used in Malaysia for the measurement of construction works

which will eventually turned into a BQ that form part of the procurement or contract document. In order to clarify the readers on the relationship between SMM and BQ, Figure 1 illustrates the significance and importance of SMM on the key player roles and activities who are involved in both traditional procurement and non-traditional procurement systems. It clearly shows that SMMs are used by the Quantity Surveyors (QS) to standardize the method of preparing the measurement for building and Civil engineering work in producing procurement document or contract document which usually include the preparation of the BQ.

There is a need for the key players in the industry to be underpinned by one standard system of measurement (Hassan, 2009; Molloy, 2007; Utama, Peli, & Jumas, 2008) in sequence to avoid any inconsistency and tedious work in

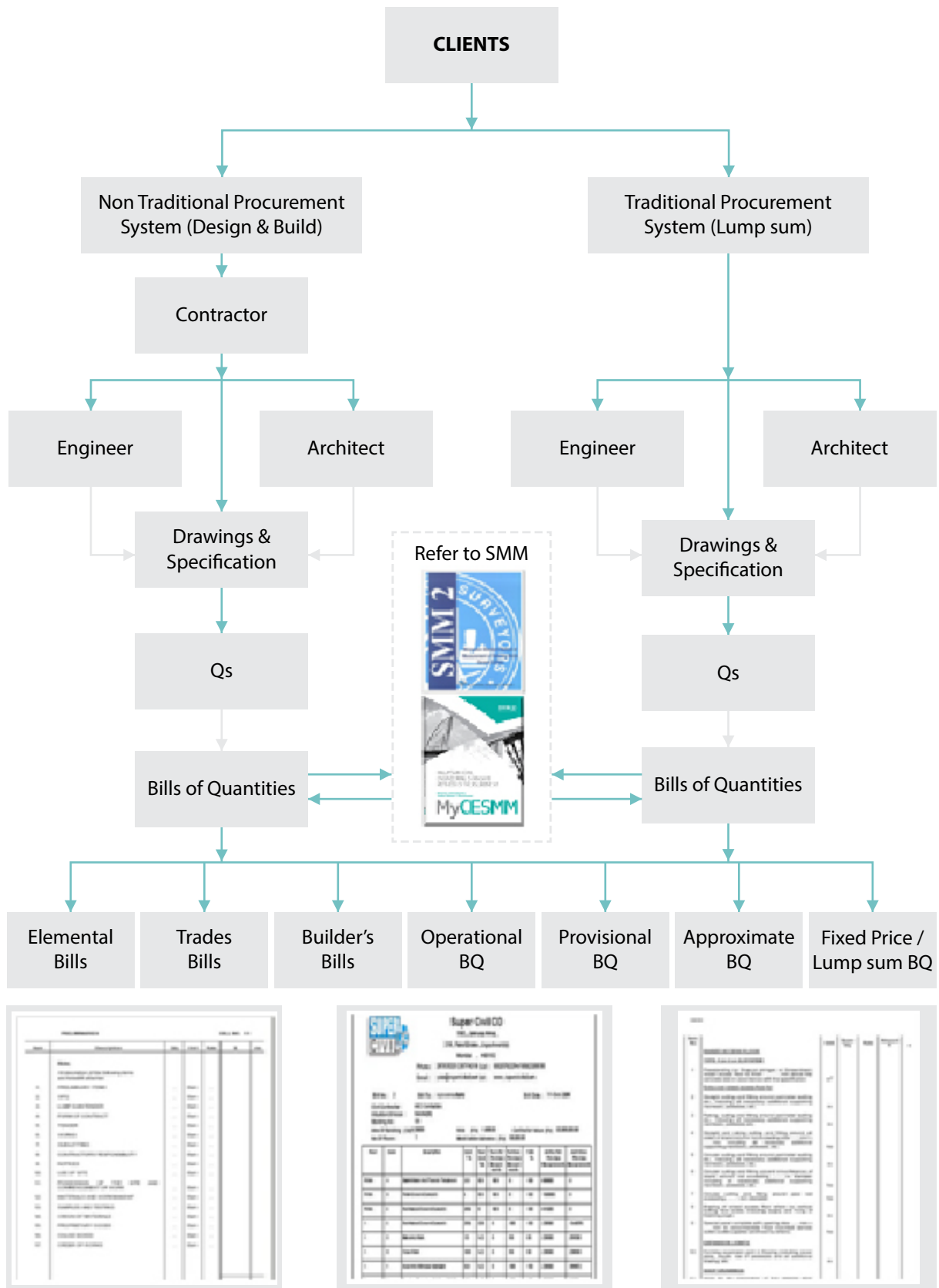


Figure 1: Significance and importance of SMM on the key player roles and activities that are involved in both traditional procurement and non-traditional procurement systems

Table 1: Developments of SMMs currently used in the Malaysian construction industry.

	Name of SMM	Year of Publish
Building	SMM First Edition	1959
	SMM First Edition (Metric)	1976
	SMM Second Edition	2000
Civil Eng.	CESMM 3 from UK	1991
	CESMM	2003
	MyCESMM	2011

conducting cost analysis and evaluation of priced BQ. Surprisingly, earlier studies done by Malaysian researchers indicated that the outdated SMM 1 (Abd Manan, 2003; Abd Razak, 2010; Fang, 2010; Ling, 2010; Yen, 2010), CESMM (Hassan, 2011) and others in house types of SMMs are still being used by the practitioners in producing BQ. Table 1 shows the developments of SMM used since the past 3 decades in Malaysian construction industry.

Despite the significances, importance and development of the SMM in our construction industry, the SMM is plagued with concerns and issues relating to the sufficiency and adequacy of its usage. The concerns have provoked questions to be asked on what are the issues which have caused such concerns and issues to surface and more importantly, how research effort could be channeled to address the concerns over the identified issues. Following the questions, a study has been conducted with an aim to explore the issues and problems pertaining to the current use of the Malaysian SMM. In order to achieve the aim outlined in this paper, two objectives were proposed: (1) Conducting a preliminary survey among the end users in order to identify the issues and problems on the application of the SMM in the Malaysian construction industry, and (2) synthesize the outcome of the survey, to use as a supporting and fundamental data to be carried along to the next level of the main research which aims to develop

a more accepted and practical SMM for construction works.

2.0 Literature Review

2.1 Standard Method of Measurement

Standard Method of Measurement (SMM) is a standard document that is localized in order to fit with the local custom and practice (Che Mat, 2010; Hassan, 2011; Gabriel Nani, Mills, & Adjei-Kumi, 2007; Utama et al., 2008) thus allows standardized measurements that provide a base to produce a good procurement or contract document (Che Mat, 2010; Hassan, 2011; Mohd Din, 2009; Myles, 2006). In other words, SMM are needed in producing a good BQ which is used as

procurement or contract documents in a project.

A comprehensive examination on the function of the SMM indicate that the rules of measurement drafted in SMMs are used for the purpose of producing a good procurement document (BQ) by obtaining a tender price for a project, and producing cost estimates or cost plans. Measurement is deemed to be strategically important to have an effective cost management of construction project and the quality of measurement is dependent on the quantity and quality of design information, economic conditions plus the clarity of the available information (Yusuf & Mohamad, 2012). Figure 2 illustrate the level of accuracy that could be achieved using the available information listed (Oforeh, 2008; Potts, 1995) as cited in (Yusuf & Mohamad, 2012). It shows how crucial it is to adopt a SMM in preparing detail BQ to achieve high accuracy in cost and contract management.

2.2 Problems or issues pertaining to the SMMs'

According to a Ghanaian researcher, SMMs are not without their critics (G. Nani, Edwards, Adjei-Kumi, Badu, & Amoah, 2008). The same goes with

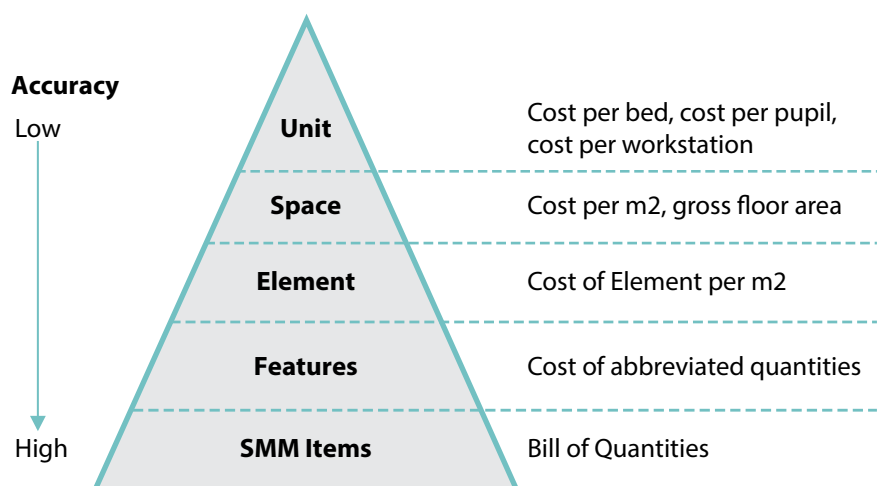


Figure 2: Level of accuracy that could be achieved using the available information

▲ **Table 2:** List of issues or problems which are currently surrounding the application of SMM as a single standard system of measurement in preparing a BQ.

Category	Issues identified	Researchers
Contents & approach	Complication of the SMM Measurement's content, description and approach	(P. R. Davis & Baccharini, 2004; Peter R Davis et al., 2009; Goh & Chu, 2002; Guan, 2010; J. B. Molloy, 2000)
	Unclear in describing the meaning of the items and the rules of measurement	(Abdul Aziz & Ali, 2004; Adnan et al., 2011; Guan, 2010; Hassan, 2011; Misnan, Mohd Yusof, & Bakri, 2002; Mohd Din, 2009)
	SMM rule promote inaccuracies in description & unit of measurement thus leading to the difficulties for the contractor to price	(R. Abd Rashid et al., 2006; Adnan et al., 2011; Che Mat, 2010; Hassan, 2011; Kim, 1992; Misnan et al., 2002; Mohd Din, 2009; Wood & Kenley, 2004)
	Some of the items of work are not covered in the latest version of Malaysian SMM; Roads, car parks (how to measure) concrete blinding (unit of measurement)	(Guan, 2010)
	Method of measurement are not detailed properly; can cause disputes at the later stage	(Hassan, 2011; J. Molloy, 2007)
Current Usage	Occurrence on the usage of various types of Standard Method of Measurement due to no regulation and enforcement body	(P. R. Davis & Baccharini, 2004; Peter R Davis et al., 2009; Fang, 2010; Hassan, 2011)
	Consultant utilize their own in house method of measurement (MoM) and etc (measurement, classification and description of the same items in various ways)	(Fang, 2010; Hassan, 2009; J. B. Molloy, 2000; J. Molloy, 2007)
Current practice of developing SMM	Copy and reuse other countries SMM without looking into it deeply and relate it with our country's needs and practice	(Hassan, 2011; Utama et al., 2008)
	Inadequate industry consultation during their development stage	(Goh & Chu, 2002)
Unable to fulfill the demand of construction environment	Measurement and the presentation should follow a set of standard rules that are familiar to both consultant and contractor.	(Adnan et al., 2011; Mohammad, 2012)
	Inability of the measured items to adequately represent real costs; measurement for pricing purposes, variation etc.	(R. Abd Rashid et al., 2006; Adnan et al., 2011; Che Mat, 2010; Goh & Chu, 2002; Misnan et al., 2002; Morledge & Stuart, 2005)
	Heavily biased towards tendering rather than administrative cost control purposes	(Adnan et al., 2011; Kim, 1992; Misnan et al., 2002; Mohammad, 2012; Morledge & Stuart, 2005; G. Nani et al., 2008)
Unimproved format	Updating and improving the current Malaysian's SMM2 into tabulated format would allow for easier computerization & incorporation into QS software	(Smith, 2004)

Therefore, their opinions regarding the interview questions are considered to be quite reliable and appropriate for this study.

Malaysia and in other developing countries, there have been many articles published on the issues pertaining to the SMM for both building and civil engineering works. Criticism and perspective on this issue have been discussed and deliberated quite lengthy by players and clients alike in publications as well as during conferences and seminars. Based on the literature review conducted, several key issues or problems have been identified shown in Table 2.

3.0 Research Methodology

In order to achieve the objectives of this paper, the information will be gathered through primary and secondary data. Firstly, the study started with a review of relevant literature which includes materials from journals, magazines, government agencies reports, seminar reports, conference proceedings and web trawl. The purpose of conducted literature review at the early stage was to identify all current issues related to the Malaysian SMM.

Table 3: Respondents' types of organization

Types of organization	Numbers
Consultancy	9
Contracting	3
Client	3

Then an exploratory semi structured interview of the practitioners in the industry was conducted. The exploratory semi structured interview approach was employed in order to confirm the issues identified through the literature done, obtained first-hand information and gained an initial understanding regarding to the problem identified. The professionals targeted are mainly Quantity Surveyors who are working in clients, consultancy and contracting organization as shown in Table 3. The interviews were conducted over the telephone and during a conference. A total of fifteen (15) interviews were conducted. The interviews were conducted over a period from August 2012 to February 2013. The interview was complemented with a follow up informal discussions with experienced industry practitioners and academicians.

Due to time lapse, we have joint an international workshop for QS BIM education & training content development held on February 2014 in order to make sure the issues identified in past finding still recent and valid. We have joint a formal group discussion which was consist of 14 participants mainly work as QS in consultancy (10 numbers) and contracting organization (3 numbers) from Malaysian and 1 qualified professional QS from Hong Kong.

During the semi structured interview session, firstly the background of the interviewees will be asked. Then, the interviewees were requested to give their comments on the followings:

- (a) Type of SMM used for both Building and Civil Engineering works.
- (b) Why some practitioners still prefer to refer to various types of SMMs
- (c) Problems or issues pertaining to the current Malaysia SMMs'
- (d) Suggestions to respond to the problems or issues discussed

Throughout the formal group discussion, the participant has being throw with issues on the measurement rules accepted by the industries and indirectly discussed on the issues drafted for semi structured interview session.

4.0 Research Findings

4.1 Profile of the respondent

All respondents selected are well experienced in construction industry. As shown in Figure 3, none of the respondents have less than 5 years' experience, only 20% of the respondents have experience ranging between 6 to 10 years, the remaining 80% have experience between 11 to 20 years and above. Therefore, their opinions regarding the interview questions are considered to be quite reliable and appropriate for this study. It same goes with formal group discussion's participants whereby all the respondent have more than 5 years' experience.

4.2 Types of SMM used for both Building and Civil Engineering works

Respondents were asked on the type of SMM they referred to in doing measurement works and preparing BQ for both building and civil engineering works.

a) Consultant Firm

A few QSs from consultant firms indicated that they are referring to various types of SMM for building works. They claimed that they will refer to either SMM1 or SMM2 when dealing with private projects. SMM 2 will be fully referred to when they are dealing with government projects. SMM7 or other in house SMMs will be referred to when they are dealing with mega or oversea projects. While for civil engineering works, they only refer to CESMM3 (UK) and CESMM (Malaysia) especially when they are dealing with huge and complex civil engineering projects. They also claimed that they do not know the existence of the newly launched MyCESMM. The participants for the formal group discussion also share the same answer on the types of SMM they referred to.

b) Contractor Firm

A number of QSs working in contracting firm stated that they prefer to use SMM1 rather than SMM2 because of its categorization of work division are by trades. The result is in line with the findings in the secondary data reviewed during the first phase of this research which stated that current SMM are heavily biased towards tendering rather than administrative cost control purposes. For civil engineering works, they prefer to use CESMM3 which is based on the UK practice.

c) Clients

Respondents representing the client are from the government sector, thus the

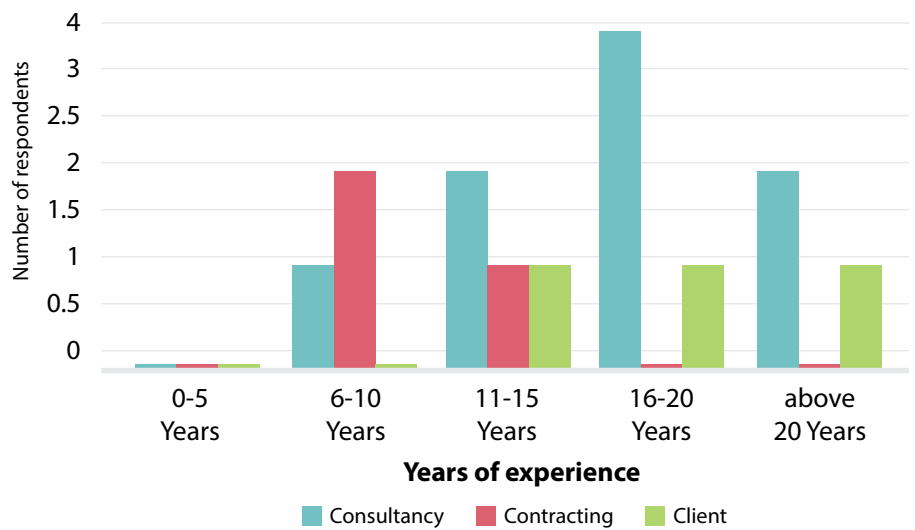


Figure 3: Number of respondents and their years of experience

SMM2 is the main document referred to by their department for building works. Meanwhile for civil engineering work, some of the older projects are still using CESMM while MyCESMM has only been used for new projects that commenced in early January 2013.

4.3 Why some practitioners still prefer to refer to various types of SMMs

Respondents from the consultants & contractors firms elaborated that one of the reasons why some practitioners still prefer to use various types of SMMs is that they are not govern by any regulation and enforcement body that instructed them to adopt and refer to a single standard document in doing measurement work and preparing BQ. This answer was supported by the respondents representing the clients. They

indicated that SMM is not a mandatory document to follow but if there are problems or issues raised in the middle of the project, they will then refer to a SMM. As a consequence, the practitioner should be underpinned and regulated by a standard document that is recognized by all key players to avoid any dispute which creates strain relationship among the key players. According to the senior respondents, persistent use of SMM1 is due to the fact that most renowned quantity surveying firms in Malaysia today were established by principal partners who had their education in the 1970s and 1980s when SMM1 was used in training quantity surveyors. They also claimed that most of the senior practitioners are reluctant to change due to their slow learning curve because of their age. Besides that, as per claimed by most of the respondents, for mega project or when the projects involved foreign parties as one of the project's stakeholder, they would then prefer to adopt other countries SMM such as the SMM from the UK. This were due to the characteristics of the UK's SMM which were succeeded in producing BQ that have more realistic relationship with both the methods of working and the cost of carrying out the work; easier to compile; more beneficial to the contractor;

...most of the senior practitioners are reluctant to change due to their slow learning curve because of their age.

better reflection on the costs involved; serve other purposes more effectively such as cost control across the works program; and management of contract.

4.4 Problems or issues pertaining to the current Malaysia SMMs'

Table 4 show the summary of the problems or issues pertaining to the current Malaysia SMMs' obtained through opinion survey of the local QSs in Malaysia. Most of the problems and issues listed below are in line with the findings from the secondary data review done at the initial stage of this research (shown in Table 2).The issues highlighted in table 4 indicate on the issues why the others in house types of SMMs are still being used by the practitioners in producing BQ.

4.5 Suggestions to respond to the problems or issues discussed

All respondents agreed on the need for the key players in the Malaysian construction industry to be underpinned by a standard system of measurement for the measurement work and preparing a BQ. One of the proposed solutions to overcome the issues and problems listed in Table 2 and Table 4 is by modifying and enhancing the current SMM to be more practical and accepted model. 92% of the respondents agreed with this proposed solution, whereby there is a need to modify and

enhanced the current SMM. Among the suggestions are;

- Creating a set of measurement protocol that is user friendly for both consultant and contractor.
- Need to have adequate industry consultation during the development of the new SMM framework.
- The contents of the SMM should be up to date to suit the demand & complexity of the current and future projects i.e. green and renewable energy technology; Industrialized Building System (IBS) and Advanced Mechanical and Electrical works.
- Include simplicity & comprehensiveness in the rules & descriptions of the items,
- Consider to create a more realistic relationship with the methods of working, the SMM and the cost of carrying out the work,
- Give more benefits and fairness to the contractor by providing better reflection on the costs involved and the methods of working.
- Try to fix both tendering and administrative cost control purposes.

Table 4: Summary of the problems or issues pertaining to the current Malaysian SMMs'

Issues highlighted
Complicated rules and description; confused the users
Unclear in describing the meaning of
Methods of measurement are not detailed properly; no illusion
Some of the items of work are not covered in the latest version of Malaysian SMM; Roads, car parks (how to measure) concrete blinding (unit of measurement)
Inability of the measured items to adequately represent real costs; measurement for pricing purposes, variation etc.
Existing of jargon word/term; not user friendly to some of the non-technical person
Current practice of developing SMM; Inadequate industry consultation during their development stages
Heavily biased towards tendering rather than administrative cost control purposes; current SMM used elemental format instead of trade format
Some elements fail to acknowledge builder's knowledge or input, measurements are not fix with the nature of contractor costing.
Paragraph format not in line with QS software technology (BIM)

5.0 Conclusion

This paper is prepared to confirm the findings from the review of the literature against an exploratory interview to give an insight of the real current issues and problems pertaining to the Malaysian SMMs before proceeding to plan the next course of actions. According to the findings of this paper, the current situations would be assessed as one of the perquisite step in suggesting the desired solution in order to make an adjustment on the current SMM to the items and terminology to reflect the Malaysian construction practices. The SMM used in the construction industry also needs to be given a proper and through review and revise to ensure they are keeping up with new developments in the construction environment which include technology, stakeholders and players as well as new demand by clients and end users. ▽

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Analysis and Surface Modeling of Concrete Wall Cracks Using Combined Thermal Infrared and Digital Camera

The occurrence of cracks in concrete is common and almost unavoidable in the construction world. The nature of the surroundings will cause cracks to happen even after extra precautions are taken in the concreting work. Therefore, there is a need to study crack patterns and profiles. This project assessed the feasibility of applying non-destructive techniques (NDT) in mapping cracks and studying the profiles in perspective 3D manner. The methodology applies combined thermal infrared imaging (TIR) and High Density (HD) digital image in capturing concrete wall cracks. In addition, a manual procedure of measuring depth and width of cracks are also undertaken. The

image processing stage applies GIS surface analysis and surface modeling tools to map cracks lines and profiles. Likewise, the TIR images are processed using software package supplied with the instrument. This project investigates wall cracks on buildings in Masjid Seri Ampangan, Nibong Tebal. The outcome of this project has enabled the portrayal of crack profile, crack depth, and crack width in 2D and 3D perspective views in the form of GIS formatted images as well as thermography images. Thus, this study provides a feasible technique for NDT applications that can increase the frequency of inspections economically in a short period of time.

Keywords: Infrared Thermography, Image processing, Cracks, Cracks mapping

1.0 Introduction

Cracks are the result of one or a combination of factors such as drying shrinkage, thermal contraction, restraint (external or internal) to shortening, subgrade settlement, and applied loads [1]. Cracking cannot be prevented but can be significantly reduced or controlled when the causes are taken into account and preventative steps are taken. The mapping of cracks and its pattern are useful in analyzing the damage mechanisms and characteristics of reinforced concrete shear walls. Crack pattern maps are used as an aid in the future development of performance-based design tools so that practicing structural engineers can build a model of wall response versus load [2]. Conversely, thermal images provide an excellent tool for rapid assessment of structures. Being a non-contact and non-destructive method, it is useful in rapid condition survey of structures without requiring any access. The method has immense potential in quality control during construction as well as investigations on deteriorated structures without interrupting construction or utility of the structure [3]. This study concentrates on evaluating the efficiency of applying

different types of non-destructive testing (NDT) imaging methods such as thermography, color and grayscale photo images, in detecting various types of concrete damages. Data from NDT imaging techniques can quantify near-surface structural damage through image-processing technique, and mapping the extent of damage quantities through digital mapping [4].

2.0 Non-Destructive Testing (NDT) Of Cracks

Cracks in concrete are common problems in building construction. It can be seen in basement floors, garage floors, and basement walls of houses. Cracks occur in sidewalks, dams, bridges and retaining walls. Any crack is a reason for concern and warrants a thorough inspection and investigation. Consecutively, crack depth is categorized into four terms: surface, shallow, deep, and through whereas crack width ranges from fine to medium to wide. Fine cracks are typically less than 0.04 inch wide. A medium crack would range from 0.04 to 0.08 inch and wide cracks will exceed 0.08 inch [7]. Cracks in a concrete if not properly identified and addressed can lead to premature failure of the coating. Some crack repair techniques are designed to prevent

significant structural failure or leaking, while others are purely cosmetic. The exact practice depends upon the length, depth and number of cracks, whether it is active or dormant, whether it affects structural integrity or not, and the purpose of the concrete structure itself. Therefore, NDT through digital image capture and processing can be an effective technique to explore in solving this problem. It is considered as a new technique that can be used for crack mapping without disturbing the original condition of the crack, as well as other parameters related.

In the last decade, NDT has become prevalent in studying the condition of existing infrastructures caused by rapid deterioration. Early detection of building deficiencies (e.g., surface cracks, sub-surface defects) allows early repairs and make possible large savings on maintenance costs. The application of thermography for NDT (TNDT) in concrete structures has been growing rapidly in the construction industry. It is a simple operation and global testing nature makes it an ideal method for building/civil engineering applications [4]. Imaging in NDT is generally used to improve inspection reliability, to improve damage detection and characterization, to automate inspection tasks and to generate information about the material properties in order to assist the

assessment of the remaining life of a structure [5]. It is achieved using a variety of image sources, such as infrared thermography, visual colour and grayscale imagery [5].

This study investigates the feasibility of using the above mentioned technique in mapping and identifying parameters of wall cracks in two dimensional (2D) and three dimensional (3D) perspectives. The scope of work in this study comprised of two major stages, which is the Fieldwork stage and the Digital Image Processing stage. The fieldwork stage involves data capture of concrete wall cracks on a specific building block in Masjid Seri Empangan, Nibong Tebal using Thermal IR Camera and DSLR-HD Camera. Currently, several of the building blocks are facing serious wall and pavement cracks and the School of Civil Engineering, Universiti Sains Malaysia (USM) was assigned to carry out the NDT experiments on the wall and pavement cracks for educational and research purposes. Meanwhile the digital image processing stage involves the processing of crack images using GIS IDRISI software and processing of thermal infrared (TIR) image using SMARTVIEW software. This stage helps to create crack surface model based on the interpolated parameters derived from digital image capture.

3.0 Research Methodology

Data capture

The study covers cracks on the wall structure within the buildings in Masjid Seri Ampangan, Nibong Tebal. Crack images were taken at different wall structures in order to compare and produce variation of results (Figure 1). A total of three images at different places having the evidence of cracks were captured digitally. A High Definition (HD) Camera (Nikon D800), with resolution of 36.3 Megapixels and a thermal camera (Fluke) were used to get high quality digital and thermal images. A tripod was used and was set up at a specific distance from the wall cracks to avoid any error or distortion in the captured image.

Data editing

Once the data captured was completed, the selected images were processed and edited using specific GIS image analysis. Initially, the captured images from DSLR camera were in the form of Joint Photographic Experts Group (JPEG) and IRT Cronista Infrared Image (IS2) file which are not readable by GIS IDRISI software. JPEG images must be converted into a readable bitmap file (BMP) for further analysis. The JPEG file images can be converted into a 256-Color bitmap image (*.bmp, *.dip) using photo editing program such as Microsoft Paint. The MS Paint program allows the currently active images to be saved in one of the following formats:

PNG	Portable Network Graphics
JPEG	Joint Photographic Experts Group
BMP	Bit Map Picture
GIF	Graphics Interchange Format file

Conversely, the thermal IS2 images are readable by the support software supplied together with the instrument i.e. the SMARTVIEW 3.1. This software provides a suite of tools that views, optimizes, annotates, and analyzes IR thermal images and videos. The 3D view enables the overall images to be viewed from every side of the image.

Digitizing for feature extraction

Digitizing process is necessary to place the marked points (dimension of selected width and depth) exactly to the correct scale of the images. This is the main requirement of the surface interpolation in the next stage. For the image to be digitized, it must first be displayed in the map window in the form of either raster or vector layer. For this project, the image was built in raster form. New vector layers were created using on-screen digitizing. The creation of a new file requires the selection



Figure 1: Cracks on building wall in Masjid Seri Ampangan, Nibong Tebal, Pulau Pinang

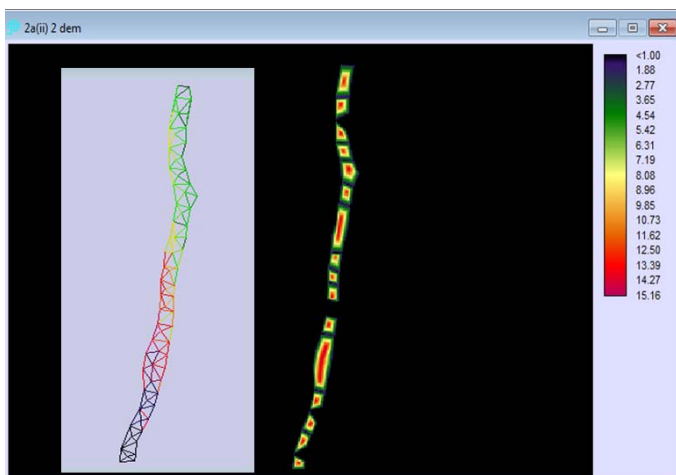


Figure 2: The interpolated TIN and surface generated from TINSURF Analysis.

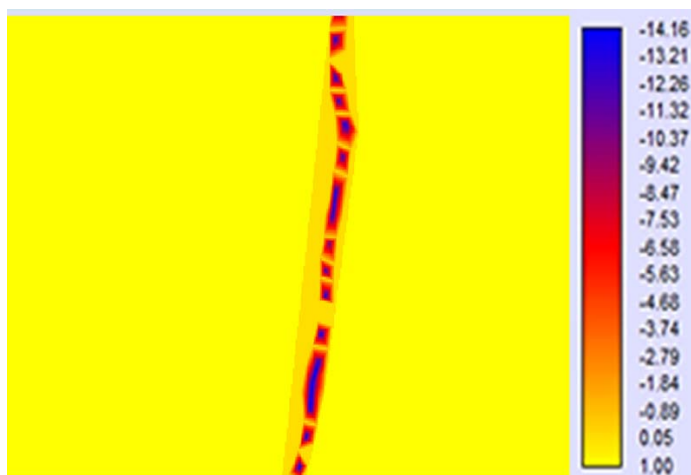


Figure 3: Depth of crack image (mm).

of object type from the list of point, line, polygon or text depending on the suitability type of the object. The ID or Value, and the index of First Feature were then inserted, for example, the creation of a point layer for the depth of the crack (in mm). The value was inserted in the index of feature column and the center crack area was assigned with the depth value, while the area representing crack outline was retained with value of 1. The whole process of putting in the value of the depth was done manually for each of the crack images.

Surface interpolation analysis

The surface interpolation analysis was carried out to form the potential surface of the overall cracks within the marked points. The surface interpolation analysis was executed by using Triangular Irregular Network (TIN) Analysis and TINSURF Analysis available in GIS-IDRISI software. TIN Analysis will interpolate the potential surface model using points or line vertices as the source of point for triangulation (Figure 3.2). In addition, the TINSURF Analysis (Figure 3.3) will generate a raster surface image from the TIN and vector file produced by the TIN Analysis.

Digital surface of crack depth

A digital surface that describes the depth of crack can be produced by initially determining a mirror surface. This is accomplished by assuming that the crack surface wall having a flat value of 1. Consequently, by subtracting this surface with the interpolated crack variation, the resultant image will produce a negative value that resembles the depth of the cracks. The resultant image that represents the depth of the crack is as shown in Figure 3.

Contrast stretching and orthographic display

Contrast stretching involves altering the distribution and range of Digital Number (DN) values. It is usually the first and commonly a vital step in image enhancement. A linear expansion of Digital Number (DN's) into the full scale (0-255) is a common option. A new image was created by linearly scaling values between a specified minimum and maximum limit. A minimum value, which is for the background image was assigned as zero, while the highest value was assigned as 255. Once the stretch procedure was completed, the

The surface interpolation analysis was executed by using Triangular Irregular Network (TIN) Analysis and TINSURF Analysis available in GIS-IDRISI software. TIN Analysis will interpolate the potential surface model using points or line vertices as the source of point for triangulation

orthographic perspective display (3D perspective view) in GIS IDRISI enabled the layers to be transformed into a 3-Dimensional (3D) image as in Figure 4. The default value for angle of view was 50° and view direction of 50° with a vertical exaggeration factor of 1.

Thermography image of crack

Handling the infrared camera is typical like other photographic camera with standard precautions. The camera was focused on the crack area at a fixed distance using the same parameters used for the DSLR camera. It must be noted that the focus, composition and range of temperatures chosen cannot be altered. However, the brightness and contrast can be adjusted in the image to highlight the required details. The images captured will be transferred to the computer and viewed by using the SMARTVIEW 3.1 software.

The present range of colors resembled specific degree of temperature. There are many choices of color palette available and can be used depending on their suitability. However, the entire palette stands on the same basic principle. The brighter region in the thermal image indicates high temperature, while the darker region indicates low temperature. From the thermography images, crack regions can be automatically detected through the variation of the highest and the lowest temperatures.

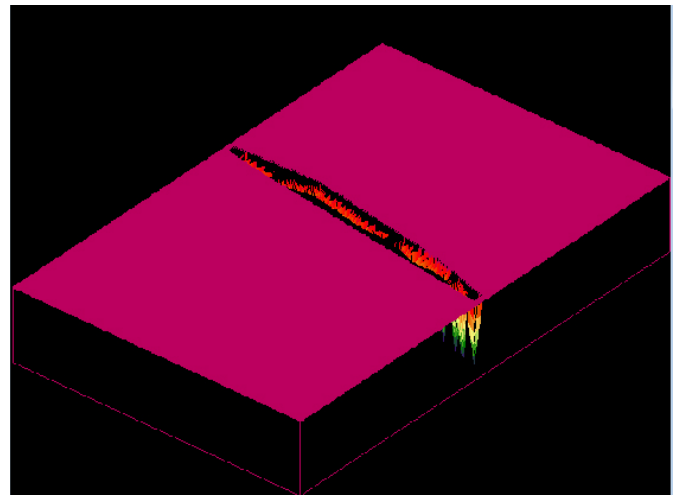


Figure 4: Image of crack presented in 3D view.

4.0 RESULTS AND DISCUSSION

The methodology has applied two different types of images of cracks i.e. in the form of JPEG file and IRT file. JPEG file images were taken using the SLR HD Camera, converted into a readable format and analyzed using GIS IDRISI software. Whereas, the IRT file images were produced from the FLUKE TIR camera, subsequently processed and viewed using SMARTVIEW 3.1 software. Both of the softwares have the capability to view profile of cracks in 3-dimensional perspectives (or 3D view) from any 360° angle.

Profile of cracks in three dimensional (3D) view

The 3D image profile (Figure 5) describes the variation of crack depth and is symbolized by length in multiple ranges of colors. Each color indicates a certain integer value describing depth of cracks. The color ranging from dark blue to bright red indicates the depth of crack. Dark blue colors resemble a lower depth, while the bright red color resembles a higher depth. Meanwhile, the length represents the depth of the crack at correct scale (unit mm). The outcome of the result has facilitated the work of detecting parts of cracks that are deep or shallow.

Profile of cracks in thermography image

The profile of thermal crack image can be viewed in perspective (3D view) from three different directions as in Figure 6. A thermography image will be mainly associated with the temperature of the surrounding. The figure shows the area of cracks at the bottom most is experiencing the lowest temperature of 103.2°F (Fahrenheit), whereas the region slightly on top is experiencing the highest temperature of 127.2°F (Fahrenheit). The average temperature of 119.1°F (Fahrenheit) can be determined in the image. The SMARTVIEW

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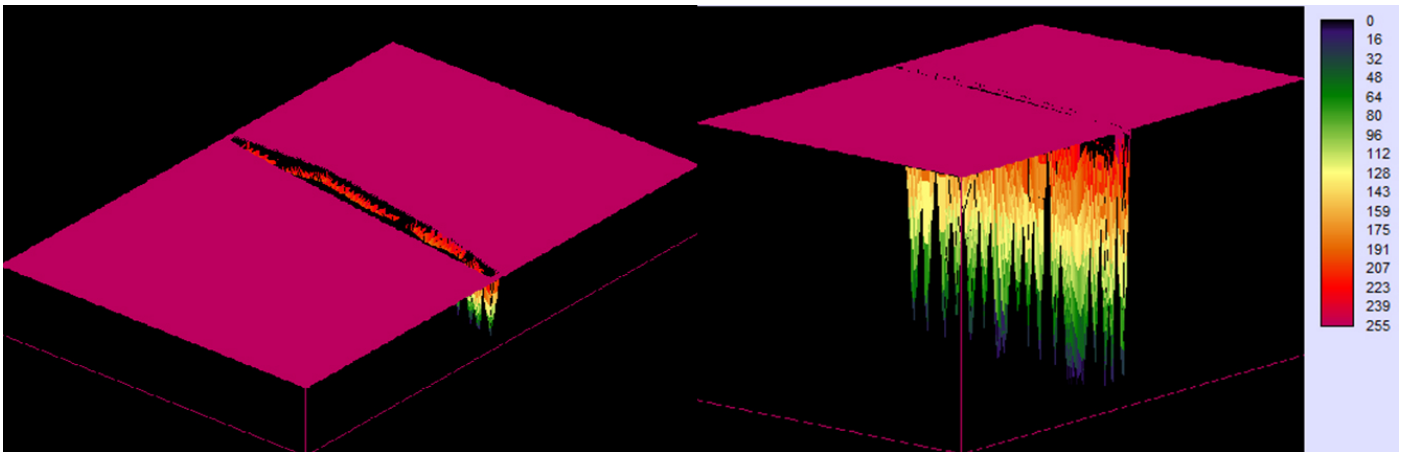


Figure 5: The 3D image from top view and side view

software can produce a quick summary report regarding the temperature of the image as shown in Table 1 and 2 respectively. However, it has to be noted that the temperature of the cracks can be influenced by external factors. Therefore, all the cracks must be exposed evenly in the sunlight to avoid error towards temperature reading. Analyzing crack profiles using the thermography images can produce results that are related to temperature. The perspective view (3D images) can be viewed and rotated 360° using a cursor. The image profile can be analyzed in three different direction, i.e. from the front, top and side view. Viewing the crack profile from the top and side gives very good presentation. On the other hand, the side view gives a clear variation of crack depth.

The side views of the thermography images are shown Figure 7 and Figure 8, respectively. The variation of the color is clearly seen as it moves deeper. The thermography image can only present the result that is related to temperature. Therefore, the result has shown that areas with deeper regions have a much lower temperature compared to the shallow regions. However, the temperature variation cannot be directly related to the depth of the crack. The lower temperature that assume that crack region is getting deeper does not have solid proves that it is associated with a deeper crack area.

Table 4.1: Main Image Markers (center box)

Report on Thermal.IS					
Name	Avg	Min	Max	Emissivity	St. Dev.
Centerbox	119.1°F	103.4°F	122.5°F	0.54	2.67

Table 4.2: Main Image Markers

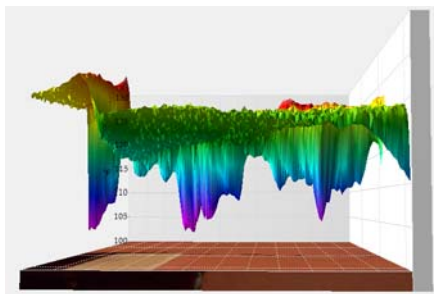
Name	Temperature	Emissivity
Centerpoint	119.6°F	0.54
Hot	127.2°F	0.54
Cold	103.2°F	0.54

A non-destructive technique (NDT) that combines digital image (HD) with thermography images was successfully introduced

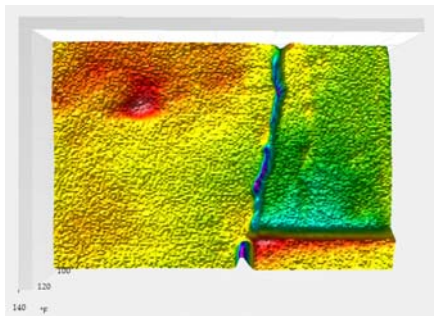
This is because there is also a variation of temperature, even though the image is basically presenting a flat surface.

5.0 CONCLUSION

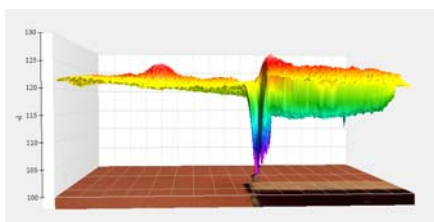
This project involves the combined method of digital image capture and manual measurement of depth and width of cracks. Since the width and depth measurements at collected at several random marked points, therefore the results cannot represent the exact crack profile. The inadequate number of points will affect the spatial interpolation of crack depth and profile. Conversely, the thermal infrared images give the results directly without the need of any further analysis. However, the thermal infrared images seemed to be influenced by several



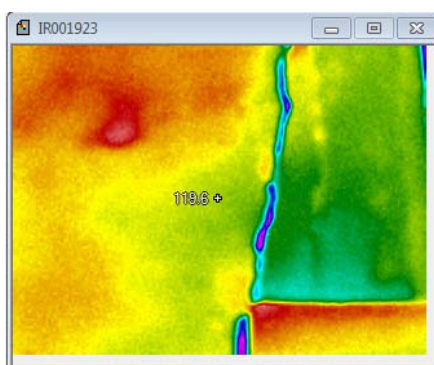
Side view



Top view



Front view



Captured image

Figure 6: The thermal image of crack in 3D view from three different sides

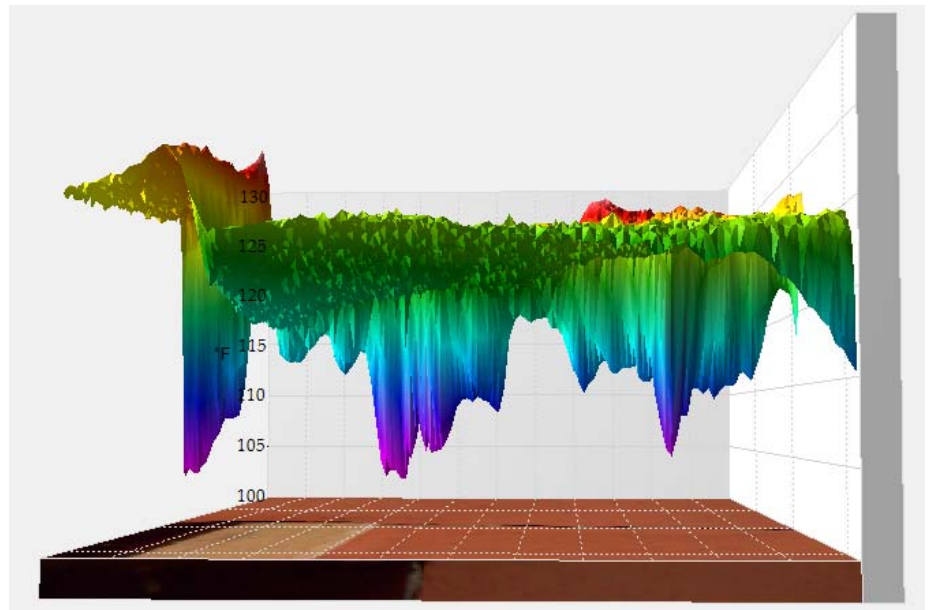


Figure 7: Side view of the 3D image.

external factors (ambient conditions and distance from camera) as well as surface conditions (emissivity and coatings). The ambient conditions such as temperature, radiation from surroundings and the time of the day affect the apparent surface temperatures significantly. Thermal images do not always represent the surface temperature but it is the value of apparent temperature processed from the radiation received by the camera.

This project is concluded by fulfilling all the specified objectives. A non-destructive technique (NDT) that combines digital image (HD) with thermography images was successfully introduced. Both methods prove to be a feasible tool for rapid assessment of structures, especially for large concrete and masonry structures, such as chimneys, towers, bridges and buildings. The methodology with respect to the spatial analysis work was successful in producing crack images and profiles as specified in the objectives and adaptable to other kinds of crack images. Besides that, this method has more advantageous when compared to the manual inspection based solely on the conventional visual approaches. The visual inspection is somehow more costly, time consuming and often facing various kinds of disruption.

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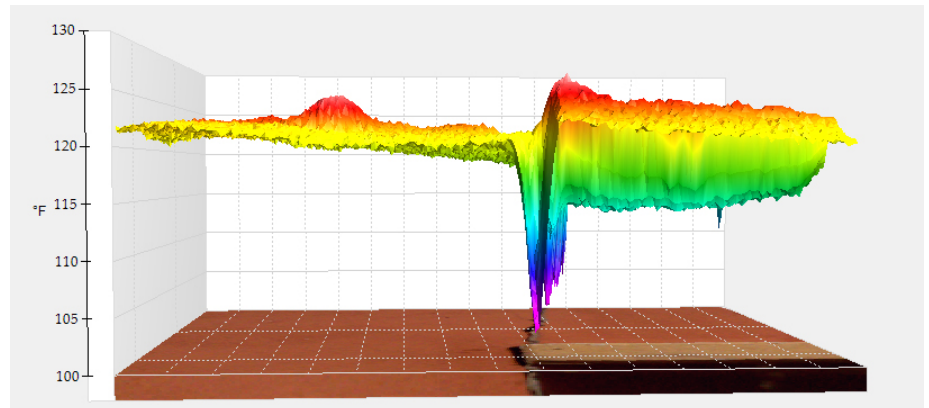


Figure 8: Front view of the 3D image

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A Preliminary Survey on the Practice of Building Inspection in Malaysia

The implementation Total Asset Management (TAM) is important in achieving a sustainable development. Safety and security are the aspect that needs to be assured in order to achieve a sustainable development. To ensure the aspects are assured, the construction professionals involved in designing, creating, maintaining and disposing the assets should have knowledge in asset management. Therefore, this paper reveals the awareness, knowledge, and familiarity of construction professionals about asset management, particularly in terms of building inspection. The data obtained by using a questionnaire that distributed between 205 Malaysian Professional from various fields of construction industry. The result shows that the majority of respondents are aware

of the need of building inspection and the importance of it. However, they are lacked of knowledge on how to perform a proper building inspection. This is because they are not familiar with the standards or protocols, which are often used as a guide. To achieve a sustainable development, all professionals involved in asset management should have sound knowledge in the principles of TAM in order to understand its basic philosophy that will help foster the implementation.

Keywords; asset management, building inspection, safety and security, facilities.

1.0 Introduction

Safety and security are the most important aspect in asset management practices, and it is one of the principles of sustainable development. Therefore, infrastructure of physical assets must be maintained perfectly and periodically by a competent and qualified agency (Shaziman, 2009). To ensure that this aspect is guaranteed, Total Asset Management (TAM) practices should be implemented. TAM goal is to protect the interests of citizens in terms of providing quality services to the people through the provision of proper assets. Previously, government agencies typically adopted a reactive maintenance of government assets that are carried out ad hoc without a systematic plan and schedule. However, after the launching of Government Asset Management Policy (GAMP), Malaysia Government gives the responsibility to each agency to manage their assets as a part of TAM approach. The document of GAMP tends to enhance a sustainable approach to any development (Baharuddin et al. 2011).

TAM is a comprehensive approach, including preventive maintenance and minimizing breakdown maintenance. TAM model consists of four main

phases of the planning phase, creation phase, consumption phase and disposal phase. These phases involving various professionals in construction and asset management field such as planners, architects, engineers, surveyors and other professionals. Then, all parties should know and fully understand the TAM approach to ensure that the goals set are achieved.

2.0 Literature Review

Asset management is a broad scope in which it combines different disciplines and processes in the maintenance of the asset. The processes in asset management, including Demand Management, Risk Management, Value Management, Life-Cycle Cost, and Economic Evaluation (Kerajaan Malaysia, 2009b). The main purpose of TAM practice is to achieve the optimal asset benefits so that the quality of service delivery can be improved (Kerajaan Malaysia, 2009b). To achieve optimal asset benefit, TAM general model is divided into two levels namely Process Management and Support Management (Kerajaan Malaysia, 2009b). Process Management consists of planning, creation, use and disposal of assets, while Support Management consists of demand management, human resources, finance, value & risk, and performance

data (Kerajaan Malaysia, 2009b). Even so, both the management is carried out based on community demand (Kerajaan Malaysia, 2009b). TAM approach will optimize the use and prolong assets' lifetime, saving government expenditure, improve government's image, and generate nation economic growth (Kerajaan Malaysia, 2009a).

Asset management is also closely related to the safety and security. Asset management processes which start from planning stage to disposal stage are to ensure the quality and performance of the assets. Asset performance is closely linked to the quality of life (Evans et al., 2001). Thus, the proper maintenance should be implemented to ensure the health and safety of building users is assured (Encon 2005). Ho et al. (2006) stated that properly maintained asset could ensure the safety of the owners, occupants and the public. In addition, a proper asset management can provide better health and economic aspects (Wie Wu 2003). Hence, the preference for asset maintenance should be evaluated based upon the level of risk assumed and the effects arising from a process (Tucker and Pitt 2009).

Yau (2011) explains that when the building was designed and built in good condition, the performance will decrease if not properly maintained.

Thus, building management is aimed to provide a comfortable living environment to the residents (Ho et al., 2006) in the long term. Yau (2011) supported that building quality maintenance is in line with sustainability principles. This reflects to the aspect of environmental and economic sustainability. Therefore, the long-term building management has become an important issue (Kohler and Yang, 2007).

In addition, improper maintenance work may cause accidents and harm the users (Raouf 2004). For example, building structural failure could result in loss of life and damage to property. Parida & Chattopadhyay (2007) mentioned without a formal performance measurement, it is difficult to plan, execute, control and upgrade the maintenance process. Therefore, Rohayah (2010) pointed out that the building management activities such as building condition assessment can assist in determine priorities for maintenance planning. Building inspection is actually a key activity in tracking building performance.

Education and training in the management of asset quality are important (Abdul-Rahman, 1996). Chan et al. (2006) stated many researchers had shown that project management is a key to achieving quality in construction. A clear and comprehensive project's specification is an important determinant of the quality of construction (Arditi and Gunaydin 1998). Therefore, it is understandable that all the professionals involved in the provision of assets should be well informed in the field of asset management. Total asset management will lead towards the achievement of sustainable development.

3.0 Research Methodology

The data is collected via the questionnaire surveys for the professionals involved

in the field of asset management. The finding is then referred to the cases that occur due to improper asset management implementation. The cases are sourced from media report.

A set of a questionnaire distributed among construction professional to get feedback on one of the key components of asset management, which is building condition inspection. This survey was conducted from January 2012 to June 2012. The questionnaires were distributed among these professionals when they are attending Building Surveying (BS) Continuous Professional Development (CPD) Talk Series consists of four series of talk. The respondents are required to answer questions posed in the questionnaire at the end of the event. The topic of the talk centered to the asset management principles.

In total, there are four main sections in this questionnaire. Part A is the question about respondents' background. Part B asked respondents' opinion about the need for inspection of the asset at a certain point of times. Then, Part C asked the opinion about the preferred methods for performing building inspection work. Finally, the respondents were asked the extent of their familiarity with the protocol or standards of building inspection

that has been developed locally and internationally.

A total of 205 respondents participated in this survey. The data is analyzed using Statistical Package for Social Science (SPSS) software. Then, the results from the analysis are presented in tables.

4.0 Result and Discussion

This section discusses the results from the research consists of the results of questionnaires and also highlights of the media reports on cases of building disasters in Malaysia.

Respondents' Background

A total of 205 participants attended the BS CPD Talk Series has participated as respondents to this survey. The respondents were among Malaysian Professionals from diverse nature of business. Table 1 show the frequency and percentage of respondents based on their nature of business. Based on Table 1, the majority of respondents were from the building management field with 22.93%, followed by construction (20.49%), academics (15.61%), insurance (0.98%) and law (0.49%). However, there are 39.51% of the respondents who belong to other groups.

Table 1: Main Image Markers

Nature of Business	Frequency	Percentage (%)
Academic	32	15.61
Construction	42	20.49
Building management	47	22.93
Insurance	2	0.98
Law	1	0.49
Others	81	39.51
Total	205	100

Table 2: Respondents' agreement on the need for building condition inspection

How far do you agree the situation below need inspection?	Percentage of Agreement (%)				
	Not agree at all	Not agree	Quite agree	Agree	Agree at all
Before purchasing the property	3.41	0.96	6.83	22.44	66.34
Before completion of building	3.41	5.36	8.29	30.73	52.20
After (just completed) completion of building	3.90	1.95	11.22	30.73	32.20
Before the issuance of certificate of practical completion	1.46	1.95	7.32	26.83	62.44
Done periodically (once a year)	7.32	11.22	20.97	28.78	31.71
Done Periodically (once in 2 years)	3.90	12.68	22.93	34.63	25.85

The need for building condition inspection

This section describes the views of professionals to the needs of the building condition inspection at a particular point of times. In general, the responses obtained showed that professionals are aware of the requirement of building condition inspection, in particular, within the specific point of time. The result of the questionnaire for the needs of building inspection condition is shown in Table 2.

Based on Table 4, the majority of 66.34% respondents are strongly agreed for the need to perform building inspection before purchasing the property. Besides, the most of the respondents also strongly agreed for the need to perform building inspections before and after completion of building. In addition, 62.44% respondents are strongly agreed to perform building inspection before the issuance of the certificate of practical completion. Comparison between the periodic inspections once a year to once every two years found that 31.71% and 25.85% respondents are strongly agreed respectively.

Preference of performing building inspection

This part presents the results of the questionnaires on the preference of performing building inspection. The results of this questionnaire generally portray the knowledge of the respondents about the proper and effective technique and method of building inspection. Table 3 shows the results of the questionnaires.

Majority 32.68% of respondents prefer the presence of owner/occupier during the inspection of building while 31.73% of them prefer at all with the situation. This may be because many felt that the presence of the owner/occupier to help the work of the inspection, especially to determine the cause of the defect as the owner/occupier are more experienced on the property. Besides, most of the respondents (41.95% prefer and 31.22% prefer at all) prefer to perform preliminary inspection once arrived at the site. This is to gather some important information that is needed to facilitate the actual building inspection.

Majority 32.68% of respondents prefer the presence of owner/occupier during the inspection of building while 31.73% of them prefer at all with the situation.

Table 3: Respondents' preference of performing building inspection

Preference of performing building inspection	Percentage of preference (%)				
	Not prefer at all	Not prefer	Quite prefer	Prefer	Prefer at all
The presence of owner/occupier during inspection	5.85	8.29	21.46	32.68	31.71
Preliminary inspection once arrived at site	6.34	3.41	17.07	41.95	31.22
External to internal	5.37	5.37	18.05	38.53	32.68
Internal to external	5.85	4.88	20.00	35.12	34.15
Start at top and working down (top down)	8.29	10.24	21.95	35.12	24.39
Start at bottom and working up (bottom up)	6.34	12.20	20.96	32.20	28.30
Start at roof space	9.27	11.22	31.22	27.32	20.98
Defect recording by long-hand (free flow writing)	3.90	12.20	27.32	41.46	15.12
Defect recording by tape-recorder	6.83	13.66	29.76	34.14	15.61
Defect recording by site-prepared sketches	4.88	3.41	21.46	41.46	28.78
Defect recording by pre-printed form/checklist	3.41	0.98	14.15	40.00	41.46
Defect recording by on-site computer	6.34	5.85	26.34	40.49	20.98
Defect recording by hand-held device (PDA, Smart phone, Tablet, etc)	5.37	5.37	17.07	38.54	33.66

The comparison between the inspection sequence from external to internal and from internal to external show, a slightly difference which is 71.21% and 69.27% (combination of prefer and prefer at all) respondents prefer respectively. These results indicate the existence of disagreement between the two approaches. The same thing happens on the comparison between top down inspection and bottom up inspection (Refer Table 3). Actual practice of building inspections should be from external to internal and top down start on roof space. This shows that many respondents still lack of knowledge in the field of building inspections.

There are several ways to record defects in the building such as by long-hand (free flow writing), tape-recorder, site-prepared sketches, pre-printed form/checklist, on-site computer and hand-held device. Defects recording techniques used are flexible and depend on the ability of inspectors.

Majority of respondents agreed with the techniques listed, but the use of forms and checklists are the most popular technique among respondents. The use of pre-printed form/checklist is to facilitate inspection and to ensure that all parts of the building inspect without leaving any important data, while the uses of other techniques are as support tools to pre-printed form/checklist.

Familiarity with building inspection standard/protocol

This section shows the results of the questionnaire about respondent's familiarity with building inspection standards/protocols that is often used. There are seven standards usually used as a guidance in building inspection works such as RICS Building Survey Report (2005), BRE Design Quality Manual (2007), ASTM E-218 (2008), RICS Home Buyer Report (2009), Condition Survey Protocol (CSP) 1 Matrix (2010), RICS Condition Report

Table 4: Respondents' familiarity with building inspection standards/protocols

How far do you familiar with this building inspection standard/protocol?	Percentage of Familiarity (%)				
	Not familiar at all	Not familiar	Quite familiar	Familiar	Familiar at all
RICS Building Survey Report (2005)	25.85	26.34	26.83	15.61	5.37
BRE Design Quality Manual (2007)	30.24	33.66	21.46	11.71	2.93
ASTME-2018 (2008)	33.17	34.63	21.46	8.78	1.95
RICS Home Buyer Report (2009)	29.27	31.71	23.90	11.22	3.90
Condition Survey Protocol (CSP) 1 Matrix (2010)	29.27	32.20	18.54	13.66	6.34
RICS Condition Report (2010)	27.32	28.78	22.44	15.12	6.34
RISM Code of Practice for Building Inspection (CPBS101) (2011)	26.34	23.41	17.07	22.44	10.73

Overall, responses obtained are disappointing when majorities of the respondents are not familiar or not familiar at all with these standards/ protocols. The highest percentage of respondent's familiar with CPBS101 with 33.17%

(2010), and RISM Code of Practice for Building Inspection (CPBS101) (2011). Table 4 shows the result of respondents' familiarity with the standards.

Overall, responses obtained are disappointing when majorities of the respondents are not familiar or not familiar at all with these standards/ protocols. The highest percentage of respondent's familiar with CPBS101 with 33.17% (Familiar and Familiar at all). The percentage followed by RICS Building Survey Report (20.98), RICS Condition Report (21.46), CSP1 Matrix (20.00%), RICS Home Buyer Report (15.12), BRE Design Quality Manual (14.64), and ASTM E-2018 (10.73). This result explains why there is confusion among respondents in the approach of building inspection, whether from external to internal or otherwise. It is because they are lacked of knowledge about building inspection practices, and they are not familiar with the standards/ protocols.

Discussion

Based from the questionnaire survey, it shows the respondents are aware of the need of performing building inspection. Their preferences are varied and mostly agreed building inspection has to be conducted once a year or once in two years. The lacking part here is the knowledge about building inspection standard, where the most respondents' are not familiar with building inspection standards. Performing building inspection and reporting building inspection are two different matters but closely related. The reporting plays a vital role, especially when it involves dispute resolution cases. The report needs to stand in court, not just the only on-site building inspection.

The lacking about building inspection reporting might be associated with the building disasters in Malaysia. One cannot predict a building defect pattern when relying purely to building

Table 5: The cases of building/structure disaster in Malaysia

No	Title	Case	Report Date	Source
1	4 fatal tragedy in the collapse of Second Penang Bridge	The structure of the bridge under construction collapsed and crash onto a car.	6 June 2013	Berita Harian Online
2	12 pilgrims went through anxious moments in the collapse of mosque roof	Twelve nearly killed after a front roof of the mosque in Binjai Kertas village, in Hulu Terengganu collapsed.	21 May 2013	Malaysiakini
3	3 friends death	The old building in PPRT Changkat Tin, Batu Gajah collapse caused three students were killed and one seriously injured.	12 July 2010	Utusan Online
4	Investigate promptly the collapsed of roof	Roof of the Sultan Mizan Zainal Abidin Stadium, Sports Complex in Gong Badak worth RM292 million collapses which resulted in about 50 percent of the structure is destroyed.	3 June 2009	Utusan Online
5	5 houses collapse due to improper drainage	Drain repairs work in the back of the houses in Taman Bukit Kajang is believed to be the cause of five houses in the housing collapse.	30 April 2008	Utusan Online

inspection activity. Only the report will tell and analyze the building defects' patterns, which enable us to predict the likelihood or tendency of any building disasters that have the possibility to occur. This lacking perhaps can be related to numerous building disasters that take place in our country, to name a few as depicted in Table 5. These cases were identified through media reports. Table 5 shows the information about the cases that occurred.

Table 5 shows some of the cases that occur due to the weakness of building management, particularly in terms of building inspection. Failure to conduct a proper building inspection caused defects that occur undetected. This can lead to structural failure of the building and pose a danger to building

users. Thus, building inspection should be done to detect any defects that may lead to any building disaster; and this should come with proper reporting of building inspection. This is to ensure that building users' safety is assured, and they can live in a comfortable environment. Based from the survey findings, the importance of building inspection is acknowledged, but the practicality is not in place. Section 85A in Act 133 (Street, Drainage and Building Act 1974) clearly mentions this, but the status of implementation remains unclear.

In general, there is building inspection works carried out in Malaysia. However, the work may be performed without following the proper protocol or standard. In addition, this inspection work may also be done

by unauthorized parties. The worst case is the building inspection is not performed at all. This may be the reason of many building disaster cases occur either at the existing or newly completed buildings.

5.0 Conclusion

TAM is an important tool in ensuring safety and security aspects that can guarantee in achieving sustainable development, if one to follow precisely. TAM can maximize asset performance and extending the life cycle of an asset. In addition, TAM also has a big role in creating complete visibility of an organization's assets.

Based on the findings, the respondents recognize the importance of asset management, particularly in terms of

building condition inspection and aware that building inspection should be done more often to avoid any defects from getting worse. However, they are not familiar with the building inspection standards/protocols. Therefore, the building inspection which is the key activity in preventing building disaster may be carried out not in the right way of truly professional competence.

To achieve sustainable development, TAM should be implemented holistically. TAM covers all stages of the asset life-cycle and all the professionals are involved. In terms of safety and security, an important part in asset management is building inspection, which should take place during construction and during the occupancy of the building. Current building inspection practices in Malaysia implemented reactively, and should be improve massively. Therefore, building inspection practices should be enhanced by conducting courses, workshops and seminars. It requires all professionals to embrace this practice.

Furthermore, Jabatan Kerja Raya (JKR) has established a guideline for building condition assessment (BCA) to improved government buildings' condition (Mohd Noor, 2014). This is supposed to raise awareness and be a guide for all parties involved in building inspection field. This guideline can also transform the current practice of building inspections that are reactive to an active practice. With the guidelines and the awareness of citizens, building inspection field has the potential to grow significantly in the near future.

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RICS Hong Kong Welcomes Property Management Licensing Regime into Legislative Process

The Royal Institution of Chartered Surveyors (RICS) Hong Kong endorses and welcomes the property management licensing regime into legislative process in Hong Kong.

Increasing housing supply has led to a surge in demand for property management services from the public, and hence a necessity to impose measures to guarantee a high quality in property management to secure a safe and healthy living environment. To achieve this, it is important to establish a regime that safeguards the quality of professional property management companies and property management practitioners. In this regard, the Hong Kong Government has introduced the Property Management Services Bill to the Legislative Council on 25 April 2014, and will conduct the First Reading and commence the Second Reading Debate on the 7th of May 2014.

RICS has always advocated the standardisation of property management practices, and supports the implementation of a licensing system. The implementation of appropriate regulations will enhance professional standards, and raise public awareness of the importance of hiring qualified property management companies to ensure the safety and value of their properties. RICS has been actively providing professional advice and suggestions to the Advisory Committee on the Regulation of Property Management Industry to help push forward this regulatory regime.



The announced Bill states that property management companies must comply with all licensing criteria, including the requirement of:

- (a) a minimum number of licensed property management directors and employees;
- (b) requirements of a recognised degree qualification,
- (c) recognised professional qualification, and
- (d) sufficient relevant work experience for licensed property management practitioners;
- (e) as well as a two-tier licensing regime for practitioners.

RICS HK is in support of these criteria and believes that these will equip property management professionals with relevant knowledge and skills for practical

application at a supervisory or managerial level. RICS anticipates a smooth and swift legislative process for the Bill and implementation of the licensing system soon to enhance the professional status of the industry as a whole.

Dr Daniel Ho, Chairman of RICS Hong Kong said: "RICS welcomes the relevant regulatory measures into the legislative process, which further establishes an industry wide standard for the property management profession. As a professional institution, RICS fully supports the licensing regime of property management practitioners in order to guarantee quality service. We also suggest that relevant departments and institutions increase resources towards property management training programmes in order to meet the market demand for qualified property management practitioners." ▽

Congratulations

The Council and all members of Royal Institution of Surveyors Malaysia would like to extend their heartiest congratulations to:



PP YB SENATOR TAN SRI DATO' Sr ABDUL RAHIM ABDUL RAHMAN,
PSM, DIMP, DMSM, DPTJ, PPRISM, FRISM, FRICS

*has been conferred the PANGLIMA SETIA MAHKOTA (PSM) award which carries the title TAN SRI on the occasion of the birthday of Seri Paduka Baginda Yang DiPertuan Agong on
7th June 2014*



PP Sr AHMAD FAUZI BIN NORDIN, JSM, KMN, FRISM

*for his appointment as
Director General of Department of Survey and Mapping Malaysia,
Ministry of Natural Resources and Environment*



YBHG. DATO' Sr LAU WAI SEANG, DSPN, DJN, BCN, FRISM

*for her appointment as
Regional President of Asia,
Commonwealth Association of Surveying and Land economy (CASLE)*

We are proud and honoured that our Past President and Secretary General have been recognized for their services rendered to the surveying profession and the community at large. We hope that their exemplary services and leadership will motivate younger members in the surveying profession to scale greater heights.



The Importance of Balancing Stress for Women

Balancing stress is always a challenge as it is vital to health and well-being. When faced with multiple roles at home and at work, all of which carry heavy demands, high stress level will contribute to health problems, poor productivity, less concentration and a diminished capacity to take on more. Finding an inner balance to minimize the stressors using an effective stress management technique could lessen the impact on the physical and emotional health.

While both genders do have a role to play in raising up the family, stress for women at work and raising the children could be high and challenging especially so when failing to set the inner balance and could affect her health status and well-being. Many studies have reported that women had more stressful days and fewer stress-free days,

and tended to face more episodes of stress in a day than did the men. This proves that it is important for women to find balance to minimize their stressors, and find effective stress management techniques to combat the daily stress that they do experience. This also proves that role balance had a buffering effect on the relationship between health status and daily hassles, thus the need for a more balanced lifestyle to lead to better health.

Inner balance for women

Inner balance is a combination of stressors and personality traits. Young to middle aged women tend to face the greatest number of stressors and experiencing more onsets of distress episodes from the demands of spouses, children, aging parents, multiple responsibilities and work. These high stressors and less healthy personality traits could significantly affect the physical and emotional symptoms of health problems as compared to the middle-age and older women.

Those aged 45 years and above could face significant stressors that could impact their physical and emotional health as the body resistance becomes weaker. What is even more serious is due to the fact that the distress state tends to continue from one day to subsequent days and the continuous interaction between these multiple stressors could affect the personality traits and health.

Living with medium to high stressors could end up with low assertiveness and the inability to express their true feelings, especially so when the love relationship is deteriorating. As age is catching up despite living with more stressors, the healthy personality traits of this age group due to maturity may have contributed to fewer health problems, thus maintaining the inner balance. As women get even older, they had the fewest stressors as the personality traits tend to increase further.

Women's roles, stress and health consequences

For women, the benefits and costs of role commitments they play and the statuses they occupy in their social networks are critically important to their physical and mental health. Failure to say 'no' when asked to commit the time to a worthy cause can add up to a lack of

Living with medium to high stressors could end up with low assertiveness and the inability to express their true feelings...

balance and excessive stress for women. However, for every 'no' there must be a 'yes' to something else, and vice versa. Perhaps, a 'yes' to work overtime for this particular weekend could mean a 'no' or less time spent with the family. It is the skill of prioritizing the schedule which is more important towards finding the true balance.

To de-clutter life, similarly to clearing out all the clutter in a room and reorganize the room by keeping only those vital things, are vital to happiness. The act of only keeping and maintaining things that are vital to life is like rescheduling life routine in their order of importance while adding new things that are important and leaving out things that are draining you or stressing you.

Family relationship and happiness

Family connection provides a certain type of social support that we all can't get from others. Families are there to be depended upon in times of crisis, be it in terms of emotional or even financial support, especially in our local context. It is the history of sharing from the day we begin life, and the sharing continues. It is the reminiscence of our childhood,

parenthood and the relatives around us, especially the closer ones. It is this uniqueness that brings us happiness and stress relief.

Nevertheless, the complexity of these relationships is not an always easy and stress can even be worse when the expected support is never near with endless reasons. It is the role that women can play their part that makes others fit nicely during these hard times, sometimes better than men. Perhaps the motherly touch softens the bad times and fits nicely towards solving the issues in hand, despite the busy schedules of being a mother and a career lady.

Dealing with difficult people, especially family members, is never easy. But while it may be better to control your stress level and improve your health to eliminate strained relationships from your life, it is not always a simple undertaking when the difficult people are relatives, co-workers, or people you otherwise must have in your life.

Adapting well to scenarios

The fact remains that that dealing with difficult people and situations is never easy. But while it may be better to relieve or at least reduce the stress level and improve the health situation, eliminating strained relationships from challenging life must be given priority. The roles played by women when confronting difficult people like relatives, co-workers, or people you otherwise must have in your life, may come with the strength of the soft touch of women. The following are tips for ladies when dealing with difficult people who are in your life, for better or for worse.

Maintaining neutral conversation

Avoid discussing divisive, sensitive and personal issues, like politics, financial or even issues that tend to cause conflict.

Religious issues may also fall under this category but when discussions are required on any matter, try to avoid discussions that will probably become an argument, change the subject or leave the situation. Try not to place blame on yourself or the other person for the negative interactions. It may just be a case of your two personalities fitting poorly. It is the supportive relationship that is more crucial towards a better mental and physical health.

Accept the reality of being a woman

In dealing with difficult people and situation, don't try to change the other person. You will only get into a power struggle, cause defensiveness, invite criticism, or otherwise make things worse. It also makes you a more difficult person to deal with.

As a woman, change your response to the other person. Accept the fact that being a woman, you also have the power to change. For example, don't feel the need to accept abusive behavior. You can use assertive communication to draw boundaries when the other person, including the other gender, chooses to treat you in an unacceptable way.

Develop the optimism and reframing skills to look into the positives as opposed to the negatives

Remember that you don't have to be close with everyone; just being polite goes a long way toward getting along and appropriately dealing with difficult people, especially the closer ones.

Learn new healthier patterns

Most difficult relationships happen due to the dynamics between two people. Stop repeating the same patterns of interaction if you found that it didn't work well over the past. Changing your response could get you out of this unhealthy situation, and responding in a healthy way can improve your chances of a healthier pattern forming. Learn new things to avoid in dealing with conflict. But the essence is the development of healthy communication skills, and women do have the power to perform better than men.

When confronted with issues that create uneasiness, try to see the best in others. Try to look for the positive aspects of others, especially when dealing with family members, and focus on them. Develop the optimism and reframing skills to look into the positives as opposed to the negatives. The other person will feel more appreciated, and you will likely enjoy your time together more. Learning to see the best in someone is vital; however, don't pretend the other person's negative traits don't exist. Work to maintain a sense of humor, and difficulties will roll off your back much more easily. See the humor in dealing with difficult people. This is part of accepting them for who they are but the most important thing is that your presence will be felt and appreciated.

Find support

Learn to get the needs that you want from others who are able to meet your needs. Identify those that you can trust, perhaps your spouse and close family members, and share some of your secrets who try to listen to your stories. These testing

episodes can differentiate between faithful and reliable family members to that of an enemy within. Base on certain proves to differentiate between trustworthy and supportive, or those who are 'killers' who add more pressure in the relationship. Know when it's time to distance yourself from this group, and try to minimize contact. Learn to cultivate positive relationships in your life to offset the negativity of dealing with difficult people. It may sound difficult if they are close relatives but if they continue to be abusive, it is best to distant yourself or cut ties and let them know why. If the offending party is the boss or co-worker, you may consider having an open talk or perhaps switch job.

The reality – foster a closer relationship with your family

A closer connection to family provides a certain type of social support that you can't get from other people. There may be some who are emotionally toxic, but we can generally depend on the rest of the family members in times of crisis for emotional and practical support, and sometimes even financial support when we are desperately in need.

Our families carry our history with them, and they generally share our future as well. Who better than siblings, parents, and other close relatives can reminisce with us about our childhoods, or remember pieces of ourselves we have forgotten? This connection to fond memories, support in times of need, and near-unconditional love is a unique way that family brings us happiness as well as relief from stress. The challenge remains that living in the competitive world do sometimes create complexities even with closer ones.

Always try to feel more connected to your family. You will not regret your efforts. ▽



RISM Sabah's Second International Surveyors' Congress:

Fostering Domestic Capacity For Economic Growth

The 7th Sabah Surveyors' Congress / 2nd Sabah International Surveyors' Congress 2014 was jointly held with the 5th Malaysia Geospatial Forum on 11th to 12th March 2014. The event was jointly organized by RISM Sabah Branch and Geospatial Media and Communications Sdn Bhd. The joint event was held at the Magellan Sutera Resort, Kota Kinabalu, Sabah.

The Guest of Honour of the joint event was the Chief Minister of Sabah, Y.A.B. Datuk Seri Panglima Haji Musa bin Haji Aman. Datuk Seri Panglima Haji Hajiji Haji Mohd.Noar, the Minister of Local Government and Housing, Sabah, came on behalf of the Chief Minister and read out his speech. In the Chief Minister's address, he said our theme "Fostering Domestic Capacity for Economic Growth" was appropriate as Malaysia is experiencing tremendous economic growth over the last few years and this

upward trend looked set to continue under the stable and capable leadership of Barisan Nasional.

He believed that the joint Malaysia Geospatial Forum and the Sabah International Surveyors' Congress was an appropriate platform for the Surveying professions to innovate, develop, nurture network and enhance our capacity so that we are more equipped to face the challenges and adversities on the one hand, and on the other hand, to harness the advantages and opportunities generated by the dynamism of a vibrant economy. He ended his speech by urging our Surveyors at the Congress to remain vigilant and competitive by fostering and developing our capabilities for economic growth and to ensure our country remains at the forefront of economic transformation with cutting edge informatics and surveying technologies.

We had local speakers as well as international speakers from Singapore, West Malaysia, Hong Kong, Singapore and Australia. Congress topics included "Geospatial Technology in the Management of Ocean and Coastal Resources" by Professor Dato' Dr Nor Aieni Hj Mokhtar; "The Mega Science Agenda – Malaysia 2050" by Dr Ahmad Ibrahim, the CEO of Academy of Sciences Malaysia; "3D Terrestrial Laser Scanner – Innovative Application for 3D Documentation" by Rodney Chaffee, the Head of Sales, FARO Asia Pacific; "Utility Specialist in the New Era" by Dr Wong King, President of the HK Institute of Utility Specialists; "GST Treatment in Construction" by Pn Raizam Mustapha, Senior Assistant Director of Customs II, Royal Malaysian Customs Department; "Fostering QS Capacity in Value Management and Technical Auditing" by Sr Francis Tan, Prokosman Konsultant; "Fostering QS Capacity in Civil Engineering Works" by Sr Jailani Jasmani, Deputy Chair QS Division, RISM Council; "Alternative Dispute Resolution – Spoilt for Choice ?" by Mdm Catherine

Chau, Chartered Arbitrator, Advocate and Solicitor, Malaysia; "Professional Indemnity Insurance" by Barbara Ligadu, Manager Operations, Progressive Insurance Bhd, Kota Kinabalu, Sabah; and many others One of the most crowded sessions in the Congress was the session on "GST Treatment on Construction" by Pn Raizam Mustapha, Senior Assistant Director of Customs II, Royal Malaysian Customs Department. However, the time given her was inadequate

and many members gave feedback that we should organize a separate seminar on GST topic. In his talk on "Malaysian Property Market 2014 Outlook", Dr Gambero, CEO of REI Group recommended that the government should contribute more actively in affordable housing by giving incentives to developers.

We learnt something new from this Congress. Instead of looking at the small number of registrations, we should look at the bigger picture of number of "participants".

According to Malaysia Geospatial Forum, there were a total of "456" participants in this combined event, a new record for us, more than double our previous years' registrations.



The 2nd Sabah International Surveyors' Congress 2014 had been a good experience for RISM (Sabah Branch) to foster the Branch's capacity and capability to organize things bigger, better, more efficiently, more effectively, more profitably and also at the same time having more fun while doing it.

The Congress Organising Committee wishes to record our vote of thanks to those who made this Congress a great success :

- Thanks to the Organising Chairman, Sr Hj Safar Untong, for his courage, skill

and good management in leading the Congress Organising Committee to a successful conclusion

- Thanks to Rosalyn Wong, Alison Chew, Faihah, Lydia, Sukarti, Beverly, Stephanie Koh, Melissa Yong, Jerome Heng, Stephanie Wong, Moon Chan, Rosmina, Hazwan and Pang who helped out at the Reception tables and our RISM / RICS Exhibition Booth

- Thanks to the speakers, participants and supporters of this Congress

- Thanks to our Congress Organising Committee who gave their close cooperation and dedication. Congress Organising Committee :

- Sr Hj Safar Untong; Secretary / Registration / Momento – Prescilla Chung; Treasurer – Sr Samuel Chong; PMVS Section Coordinator / Logistic – Sr Sunny Kelvin; GLS Section Coordinator – Sr Alex Chong; QS Section Coordinator – Sr Stephen Ng; JO Representative – Sr Grace Chung; Program Coordinator / Equipment – Mr Chew Yun Nor; Corsages – Mdm Suzieanah Harun; Design & Printing – Sr Alexel Chen; Floor Manager – Sr Sylvia Chin; Committee Members – Sr Liaw Lam Thye, Sr Catherine Yen, Sr Peter Yap FS, Sr Maria Othman, Sr Danny Chew, Sr Simon Chung; Executive Secretary – Mdm Noryzan Kelim





Women in Surveying Leadership Seminar

Do women need to strive harder in order to climb the corporate ladder? Are the qualities of being a woman leader different from a man? What are the challenges faced by women leaders?

These were the questions in the minds of the 50 RISM Women Surveyors, from all 4 divisions, when they attended the WOMEN IN SURVEYING LEADERSHIP SEMINAR on 4 APRIL 2014, at TOWER C, DATARAN MAYBANK MULTI PURPOSE HALL.

Supported by Etiqa Insurance & Takaful the one day event was conducted by Ms Lily Lau, a Directive Communication Accredited Master & Change Mentor, BSc, CPT, CIT and her team from Culture Dynamics.

Lily began by educating the participants on the different qualities between men and women leaders, and the differences

between management and leadership which is often misconstrued.

Throughout the interactive and fun filled day the Women Surveyors' potentials, talents and personal qualities were unleashed to discover their leadership qualities. They got to do the Colored Brain



Communication Inventory to uncover their brain genetic thinking process which was then translated into their personal communication and inter-personal styles.

At the end of the workshop, the Women Surveyors' were able to develop capabilities to understand people better, overcome misunderstandings and minimize conflicts which could be behaviours that hinder



success. They also saw the benefit of reflect from within their strengths and gaps, to personally identify what needs to be done in order to achieve their desire.

It is hoped that this and future series of activities would increase the visibility of Women in Surveying within the industry and beyond.

ANNOUNCEMENT

JULY 2015 PROFESSIONAL EXAMINATIONS

(Direct Final/Final, Intermediate, First And Foundation Examinations)

Applications to sit for the above examinations are now open and application forms can be obtained from the RISM Secretariat. The application form should be submitted to the RISM Secretariat **not later than January 31, 2015 together with the examination fees.**

A penalty fee is payable if you submit your application between February 1, 2015 and March 31, 2015 after which no application will be accepted. The rules and syllabuses of the Professional Examination and past years question papers are available for sale at the RISM Secretariat office.

The examination fees are as follows:

Foundation Exam

RM30.00 per subject

First Exam

RM50.00 per subject

Intermediate Exam

RM100.00 per subject

Final/Direct Final Exam

RM150.00 per subject

QS Amazing Race & Student Seminar 2014

This yearly students' seminar and team competition was held at Nippon Paint Convention Centre on 31 March 2014. 167 students from the following universities and 26 RISM members attended this seminar.

- Universiti Teknologi Mara (UITM) - 22pax
- Universiti Malaya (UM) - 29pax
- Universiti Teknologi Malaysia (UTM) - 37pax
- Taylor's University - 36pax
- Universiti Tunku Abdul Rahman (UTAR) - 15pax
- Politeknik Sultan Azlan Shah - 28pax



QS Amazing Race 2014 Overall Winner

The QS Amazing Race 2014 team (10pax per team) competition comprises of BQ preparation competition at Nippon Paint Convention Centre as well as a painting competition at RISM Secretariat Basement Resource Centre. The Overall Winners for QS Amazing Race 2014 team competition are as follow.

#1 Universiti Teknologi Malaysia (UTM)



Each universities were also required to submit their best drawn poster themed "RISM QSJO Pray to God for MH370" during the course of the competition and the winning universities for the poster competition are as follow:

- 1. Universiti Teknologi Mara (UITM)
- 2. Universiti Teknologi Malaysia (UTM)
- 3. Universiti Malaya (UM)



#2 Universiti Teknologi Mara (UITM)



#3 Universiti Tunku Abdul Rahman (UTAR)





ISBN
9780956931306

Title
International valuation standards 2011

Author (s)
International Valuation Standards Council

Publisher & Year
London: International Valuation Standards Council, 2011

This book contains the IVS Framework and the 11 other International Valuation Standards that were approved for issue by the Standards Board as at 1 July 2011, together with an introduction explaining the major changes made to previous standards.



Title
Peraturan-peraturan Juruukur Tanah Berlesen 2011 = Licensed Land Surveyors Regulations 2011. [P.U. (A) 331/2011]

Publisher & Year
Kuala Lumpur: PNMB, 2011



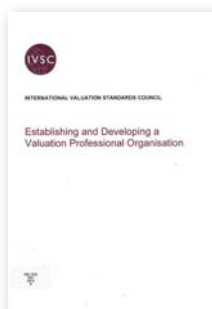
ISBN
9780956931368

Title
International valuation standards 2013

Author (s)
International Valuation Standards Council

Publisher & Year
London : International Valuation Standards Council, 2013

Contains the IVS Framework, IVS General Standards, Asset Standards and Valuation Applications approved as at 1 July 2013.

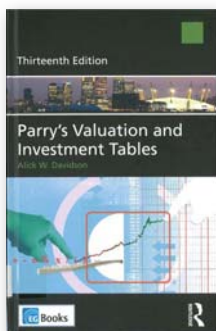


Title
Establishing and developing a valuation professional organisation

Author (s)
International Valuation Standards Council

Publisher & Year
London : International Valuation Standards Council, 2013

This guide provides good practice guidance about the role of the valuation profession and the role and responsibilities of valuation professional organizations. It is designed to be practical tool to help those involved in establishing a valuation professional organization, and to further develop existing valuation professional organizations.



ISBN
9780080971353

Title
Parry's valuation and investment tables/ Alick W. Davidson. – 13th Edition

Author (s)
DAVIDSON, Alick W.

Publisher & Year
London : Routledge, 2013

The purpose of this edition is to provide a comprehensive set of some 30 different valuations and investment tables in one volume.

The Years' Purchase (Present Value of £1 per annum) tables, based on the assumption that income is received quarterly in advance, have been extended and given more prominence. In practice today, calculations are required for a variety of purposes which often justify more than one approach. With this in mind, Internal Rates of Return tables have been retained in a modified form. Using these tables, both growth and non-growth scenarios can be analysed for a more detailed appraisal of specific freehold property investments and to provide a basis for more in-depth investment advice.



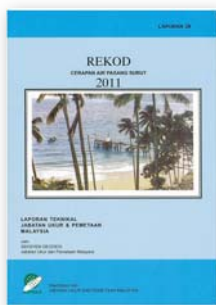
Title
Jajual ramalan air pasang surut 2014 Malaysia = Tide tables 2014 Malaysia

Author (s)
Malaysia. Jabatan Ukur dan Pemetaan

Publisher & Year
Kuala Lumpur : Jabatan Ukur dan Pemetaan Malaysia, 2014

The publication of the Tide Tables is made annually by the Department of Survey and Mapping Malaysia.

Tidal predictions are prepared for twenty-two (22) tide stations using 60 tidal constituents. The Datum label adopted for tidal predictions is the Indian Spring Low Water (ISLW).

**Title**

Rekod cerapan air pasang surut 2011.
Laporan Teknikal Jabatan Ukur & Pemetaan
Malaysia/ oleh Seksyen Geodesi. Jabatan
Ukur dan Pemetaan

Author (s)

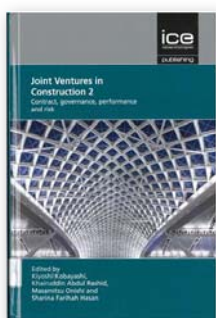
Malaysia/Malaysia. Jabatan Ukur dan
Pemetaan Malaysia.

Publisher & Year

Kuala Lumpur : Jabatan Ukur dan Pemetaan
Malaysia, 2014

The records explain the method used for
the computation of daily, monthly and
yearly mean sea level values from tidal
observations.

All tidal heights and levels in this publication
are referred to the Zero of Tide Gauge at the
respective tidal stations.

**ISBN**

9780727757838

Title

Joint ventures in construction 2 : contract,
governance, performance and risk / edited
by Kiyoshi Kobayashi ... [et al.].

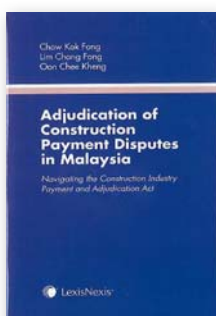
Author (s)

Kiyoshi Kobayashi 1953 July 1

Publisher & Year

London : ICE Publishing, 2012

A collection of carefully selected papers
from the International Conference on Multi-
National Joint Ventures for Construction
Works held in varying locations within the
Asia Pacific region. The book endeavours to
report ongoing debates on the theory and
practice of contract and contract formation,
governance, performance and risk in joint
ventures, with special emphasis on countries
within the Asia and Pacific region.

**ISBN**

9789674002091

Title

Adjudication of construction payment
disputes in Malaysia: Navigating the
construction industry payment and
adjudication act / Chow Kok Fong, Lim
Chong Fong & Oon Chee Kheng

Author (s)

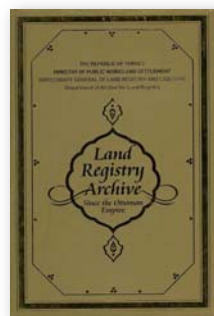
Chow Kok Fong

Publisher & Year

Petaling Jaya, Selangor: Lexis Nexis Malaysia
Sdn Bhd, 2014

This book by three prominent construction
contracts specialists provide adjudicators
and parties in adjudication with a primer to
navigate through the various provisions of
the Construction Industry Payments and
Adjudication Act ("the Act"). The first part of
the book sets out a commentary of the Act
and includes pointers on how the practical
dimensions of the subject may develop
within the context of Malaysia. The second
part of the book contains two adjudication
decisions and forms which may serve as
templates for the various processes of the
Act.

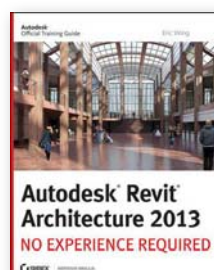
As the Act is new, the Annotations in this
title will prove useful to the building and
construction industry, especially construction
professionals and government departments.

**Title**

Land Registry Archive: Since the Ottoman
Empire. Volume 1 of Department of archive
for land registry publication

Publisher & Year

Republic of Turkey Ministry of Public Works
and Settlement, directorate general of Land
Registry, 2010

**ISBN**

9781118255940

Title

Autodesk Revit architecture 2013 : no
experience required

Author (s)

WING, Eric V.

Publisher & Year

Indianapolis, Ind. : Wiley, 2012

Autodesk Revit Architecture: No Experience
Required takes newcomers step by
step through this leading BIM software
with a real-world project that enhances
understanding.

LIST OF NEW MEMBERS

February 2014–April 2014

QUANTITY SURVEYING

Fellow

Sr. Hj. Ismi Bin Mohamad
IM Jurukur Bahan

Datuk Sr. Zainal Abidin Bin Mohd Rafique
Q1-PMC Sdn Bhd, KL

Member

Sr Adzlanezam Bin Harun
MF Associates S/B

Sr Baharudin B. Ismail
Pnsb Mgmt CoOonsultancy S/B

Sr Che Zaharah Bt Che Haron
JBB Consultants Sdn Bhd

Sr Faridah Bt Ahmad
JKR Malaysia

Sr Iswari Akair
HAH Associates

Sr Kamaratul Sarah Bt Ahmad Tarmizi
JO QS Consult, Kuantan

Sr Nurfidatul Ema Bt Saaidin
JKR Selangor

Sr Nur Waheeda Binti Ismail
JKR, KL

Sr Nuzra Efendi B. Md Ariffin
Perunding NFL

Datin Sr Sofiah Bt Mohd Salim
JBB Consultants Sdn Bhd

Sr Tajuddin Arshad Bin Mat Ghani
MAA Associates

Sr Teresa Chan Ni Yeng
Econcos Consultants

Sr Zailawati Binti Khalid
KSK Associates S/B

Graduate

Ahmad Naqib Bin Majudin
Perunding NFL Sdn Bhd

Aminuddin Bin Ibrahim
Politeknik Kota Kinabalu

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JKR

Chew Poh Ha
Hanafi Konsultant

Chew Yoek Chin
GMC Corp. S/B

Chung Ee Ling
Slattery Australia

Elizabeth Neliana Anak Nelson
Executive College

Farah Liyana Bt Zainudin
JUBM S/B

Fatin Shatirah Bt Mohammed Hanif
JUBM Sdn Bhd

Gunasundari a/p Subramaniam
Langdon & Seah Sdn Bhd

Hew Wei Gian
Unitech QS Consultancy Sdn Bhd

Hocan Lai Cheen Ho
JUB Sdn Bhd

Huzhayfah Bin Zahari
Mie Oil & Gas S/B

Jefri Bin Masood
Perintis Konsult S/B

Khairul Bariah Bt Azmi
KA Associates

Khoo Xue Ying
Politeknik Kota Kinabalu

Kok Wing Yan
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Lew Hooi Siew
Unitech QS Consultancy Sdn Bhd

Liew Chee Leong
Unitech QS Consultancy

Lim Ai Chern
Unitech QS Consultancy

Lim Eng Jin
Kuantibina S/B

Loh Ngak Leng
JUB Sdn Bhd

Luqman Bin A Zamani
MAA Associates

Mariati Bt Jaafar
Politeknik Kota Kinabalu

Michael Teng Loong Ing
Executive College

Mohd Norhazli Bin Jasman
Politeknik Kota Kinabalu

Mohd Solehin bin Sabran
J.U.B Sekutu S/B

Muhammad Hafifi Ahmad Zubir
KA Associates

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JUBM Sdn Bhd

Norshashimah Jamaludin
Politeknik Kota Kinabalu

Nor Amalkarmimi Bt Ali
Rolid Setia Sdn Bhd

Nor Haziera Binti Mohd Razali
KA Associates

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JUBM Sdn Bhd

Noor Shuhada Bt Kamaruzzaman
Perunding DMA Sdn Bhd

Nur Illiana Bt Husin
Jasa Ukur Bina

Nurul Izza Azashikin Bt Meor Khazamuddin
JUBM S/B

Ooi Ee Hwei
Unitech QS Consultancy Sdn Bhd

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JUBM, PJ

Raudhah Binti Sellah
JUBM, PJ

Rosita Mokhtar
Syarikat Prasarana Negara Berhad

Sapturani Bin Ladin
Politeknik Kota Kinabalu

Seah Han Rong
Keduca Sdn Bhd

Shahairul Bin Sairi
JKR Malaysia

Syuhaida Bt Che Husin
KA Associates

Ummu Habibah Bt. Yahaya
Unitech QS Consultancy S/B

Vera Chong Jia Ci
Langdon & Seah S/B

Yap Bee Yin
Langdon & Seah Sdn Bhd

Probationer

Azman Bin Mohd Ihsan
Pengurusan Aset Air Berhad

Chew Soo Sin
CKP Nizaruddin Jurukur Bahan S/B

Kua Che Leang (Stanley)
Titijaya PMC S/B

Kueh Siew Hui
Naim Land S/B

Ng Kuan Hin
Jurukur Bahan FPS S/B

Yeong Kim Taei
Ehsan Bina S/B

Student

Chan Pei Sean
Leong Pui Yian
Liu (Liew) Chong Min
Loh Wei May
Tan Chong Hao
Tay Yee Ling
Voo Chyun Yung

PROPERTY MANAGEMENT, VALUATION AND ESTATE AGENCY SURVEYING

Fellow

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KLCC Property Holdings

Member

Sr Adibah Abdul Mutalib
UiTM

Sr Ahmad Azuran Ramlee @
Mustafa
MRCB

Sr Chong Chun Loong <i>Knight Frank</i>	Probationer Billy Low Chin Joon <i>Property Hub</i>	Mohd Azuan Bin Abu Bakar <i>Grand Prestigious Properties</i>	Muhammad Zaim Syafiq Helmy Syamza Najihah Juma'at Nurul Atikah Che Sha'ari Nurul Atiqah Raini Noor Zatul Iffah Mohd Zainal Nor Shahirah Abdul Hamid Nurul Shahira Md Isa Nursyafiqah Kamarul Baharim Siti Nuraini Mohd Repin Wadda Thahirah Abdullah Zailani B Mat Daud <i>True Vest Property Consultants S/B</i>
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Sr Fung Cheng Loong <i>Jabatan Penilaian Perkhidmatan Harta</i>	Choong Shu Nee	Ng Tuan Leong	
Sr Goh Chong Theng <i>Knight Frank</i>	Chua Lee Chin	Ong Chin San <i>Anzal Property Dev.</i>	
Sr Khoo Poh Wai <i>Concept Property Mgmt</i>	Chua Park Chin <i>Mestika Sayangria</i>	Phang Lee Jan <i>K Youth Dev.</i>	
Sr Hamidon Haron <i>JPPH Kelantan</i>	Gan Chun Hui	Seet Ju Lienne <i>Play Pictures</i>	
Sr Haizul Bin Abdul Hamid <i>Jabatan Penilaian Perkhidmatan Harta</i>	Goh Kim Yang <i>Royale Rich RE</i>	Siow Choo Yau <i>Mahzhong Properties</i>	GEOMATIC AND LAND SURVEYING
Sr Lim Choon Yong <i>City Valuers & Consultants S/B</i>	Goik Kian Chai <i>Foxton Estate</i>	Soh Pei Wen	Member
Sr Mahadzir Bin Isa <i>Rahim & Co</i>	Jee Yik Seng <i>Mahzhong Properties</i>	See Li Lian	Sr Ahmad Nazlie B. Muhamad <i>JUPEM KL</i>
Sr Mohd. Fadzli Abd. Rahman <i>KGV International</i>	Jocelyn Ooi Wan Yee <i>Time.Com</i>	Seik Heng Yik <i>KPMG Mgmt & Risk Consulting</i>	Sr Akhbaaruddin B. Abd Hamid <i>JUPEM KL</i>
Sr Nadila Binti Hamidi <i>Jabatan Penilaian Perkhidmatan Harta</i>	Kan Weng Hoe <i>Adventis Corporate</i>	Siau Seng Meng	Sr Che Zakiah Binti Ahmad <i>JUPEM Kedah</i>
Sr Nazmi Bin Osman <i>Penilaian Hartanah Selangor S/B</i>	Keith Ngai Ji Seng <i>MSC Malaysia Tech</i>	Tan Yan Nee <i>ISC Sdn. Bhd</i>	Sr Khairil Anwar B. Sabri <i>JUPEM Pahang</i>
Sr Nithiyaini Jewa <i>PPC International</i>	Kuan Nyet Hooi	Tang Chung Yeh <i>Leader's Real Estate</i>	Sr Faradina Binti Marzukhi <i>UiTM, Shah Alam, Selangor</i>
Sr Sharmini Christina Ratnasingham <i>Jones Lang Wootton</i>	Lee Shin Wey <i>Dangyue Infra</i>	Tang Thien Ming <i>C&G Consultancy</i>	Sr Fazella Salwa Binti Solihin <i>JUPEM KL</i>
Sr Tang Shin Wee <i>CH Williams</i>	Lee Yuan Lim <i>Standard Chartered Bank</i>	Too Meng Yong	Sr Fazella Salwa Binti Solihin <i>JUPEM KL</i>
Graduate Affiq Hakim Kamisan <i>CB Richard Ellis</i>	Liew Kuet Kiong <i>Malaysia Steel W</i>	V. Sandrasagaran Veerappan <i>Self-employed</i>	Sr Kamarul Azam B. Kamarul Baharin <i>JUPEM KL</i>
Mohd Nazri Bin Mohd Saad	Lim Ah Leck <i>Tiram Realty</i>	Student Ahmad Ashraf Hashamuddin Ani Abdullah Azmeera Hashim Chong Yien Chin <i>Platinum Properties S/B</i> Eddie Tan @ Tan Lit Yuan Eng Eng Chuan Fatin Sri Nadrah Sakimin Hasril Ashraf Md Saad Hurairah Hasbullah Izzati Afifa Salim Leong Kong Meng Mohamad Farudin Abd Rahman Mohd Hairizulfahmi Sharip Mohd Sharulizwan Mat Shahrudin Muhammad Nazmi Sulaiman	Sr Lenny Sharinee Sakai <i>JUPEM KL</i>
Lim Boon Ping <i>Tiram Realty</i>	Lim Sorng Yornng <i>Henry Butcher</i>		Sr Mohamad Zikri B. Mat Isa <i>JUPEM KL</i>
Tei Kwan Fei	Lim Weixian <i>Zerin Properties</i>		Sr Mohd Firdaus Bin Sulaiman <i>Jurukur Perunding Services Sdn. Bhd.</i>
	Low Fei Dih <i>Chester Properties</i>		Sr Mohd Nasri Mat Bah <i>Prisma Survey Consultants</i>
	Low Han Jen		Sr Mustafa Bin Yaacob <i>JUPEM KL</i>
	Low Mee Yee		

LIST OF NEW MEMBERS

February 2014–April 2014

Sr Nawi Binti Abdullah
JUPEM KL

Sr Noor Azlan B. Mhd Nor
JUPEM KL

Sr Nur Shakila Bt Tahir
JUPEM KL

Sr Nursyahani Binti Nasron
UiTM, Perak

Sr Rafidah Binti Md. Saleh
JUPEM KL

Sr Roslan Bin Abdul
JUPEM KL

Sr Rosmartini Binti Abd Rahman
JUPEM KL

Sr Saripul Hissam Saidon
JUPEM KL

Sr Sim Ching Yen
JUPEM KL

Sr Tan Chwee Guan
JUPEM KL

Sr Voon Bun Chin
Kuching, Sarawak

Sr Wira Akmal Mohamed
JUPEM KL

Sr Zurina Bt Ahmad
JUPEM KL

Graduate
Low Wen Chai
Pahang

BUILDING SURVEYING

Graduate
Au Yong Cheong Peng
UM

Irna Nursyafina Binti Rosdi
Keduca S/B

Kamarul Arif Bin Abdul Wahab
JKR

Khairool Hidayat Bin Zulkifli
K & P Cove Consultancy Sdn Bhd

Mohd Syafiq Azfar Bin Noor
Suhaini
K & P Cove Consultancy Sdn Bhd

Mohd Syafiq B. Shukri

Muhammad Zaki B. Mahayuddin
K & P Cove Consultancy Sdn Bhd

Nik Elyna Myeda Bt Nik Mat
UM

Nor Adilah Bt Azmi

Nor Amin Bin Mohd Radzuan
Uitm Sri Iskandar Perak

Noorain Binti Mat Hassan

Noor Ashikin Bt Mohamed
K & P Cove Consultancy Sdn Bhd

Noor Najwa Bt. Nor Hissam
JKR Pahang

Noor Suzaini Binti Mohamed Zaid

Nurhayati Bt Zulkeply
UCSI

Nurul Diyana Binti Mohd Dahari
JKR

Nurul Shazwani Binti Azmin

Saromy Bin Subry
Nepta Development Sdn Bhd

Syazwani Binti Abdul Rahman

Zahiruddin Fitri B. Abu Hassan
UM

Probationer

Atirah Hazwah Bt Abdullah Hani
UCSI

Ridzuan Bin Yacob
Lebtech Constructin Sdn Bhd

Roshan Bin Rasid

Mohd Noor Izwan B. Mohd
Rosllan

Student

Awg Ismailludin Bin Awg Husaini
Bob Harris Norbert

Chin Sin Yee
Dg Badariah Bt. Ag Ali
Fatin Farhana Binti Hassian
Fazilah Bt Md Razak
Ismawati Bt Ismail
Julian Anak Frederick
Khairiz Izman B. Hasni
Koh Joo Guan
Mohd Azri Safuan B. Sudin
Mohd Amyrul Bin Mohd Yusoff
Mohamad Aminuddin B. Karim
Mohamad Fakhrol Zahin Bin Alias
Mohamad Shafik Bin Rosman
Mohamed Farhan B. Mohamed
Shajahan
Measa a/p E Kuan
Muhammad Amir B. Ahmad Rafidi
Muhammad Asraf B. Husni
Muhd Shahrul Nizam B. Ismail
Nabila Bt Mohamad
Nor Aini Binti Rozlan
Nor Shahira Binti Ahmad Termizi
Nuramni Afifah Bt Ruzlan
Nurbasirah Binti Mohamed Alias
Nur Adila Bt Ahmad Sukri
Nurulhuda Bt Abdullah
Nursriafitah Binti Kasnon
Nur Farhani Binti Ab. Aziz
Nur Izzati Binti Azizan
Nur Shuhada Binti Ghazali
Nurul Afifah Bt Abd Hamid
Nurul Azieantey Binti Suhaimi
Nurul Elani Binti Mohd Nawi
Nurul Hasyani Binti Ederis
Nurul Nadiyah Bt Maliki
Nurul Rezuana Bt. Buyung
Nurul Syazana Bt Salim
Omarulhanif B. Shahrudin
Phang Zi Jian
Raja Nurul Waheeda Bt Raja Zilan
Sandheneswaraen A/L
Segeranazan
Siti Sabreena Hj. Shukri
Siti Norninashakhila Bt Yashri
Siti Nursa'adah Binti Haron
Siti Nurshafiqah Binti Mohd
Zulkairi
Sumalin Petnin A/P Tanat
Tan Leng Ee
Yeap Ee Ling
Zulkhairi B. Matori

CALL FOR PAPERS

21st Pacific Rim Real Estate Society Conference

“Leveraging on Sustainable Real Estate & Built Environment”
Kuala Lumpur, Malaysia | January 18–21, 2015

Co-organised by



Royal Institution of Surveyors Malaysia (RISM), Pacific Rim Real Estate Society (PRRES) and 8 leading universities in Malaysia invite you to the 21st Pacific Rim Real Estate Society Congress which will be held in Kuala Lumpur, Malaysia on 18 – 21 January 2015.

The theme for the conference is “**Leveraging on Sustainable Real Estate and Built Environment**”. Authors are invited to submit papers for the following sub-themes. Papers concerning similar topics in geomatic and land surveying, building surveying, quantity surveying, law, investment and finance are expected to be presented. The sub-themes include but are not limited to the following.

- Real estate investment and finance
- Real estate markets
- Property conservation
- Technology issues
- Property management
- Construction economics
- Housing issues
- Sustainable investment and development
- Education
- Property valuation

This conference provides a major international forum for presentation and discussion of the latest property research by researchers, practitioners and policymakers. Activities planned for the conference include parallel sessions, keynote addresses by eminent speakers, higher research sessions, breakfast sessions and a gala dinner. Both refereed and non-refereed papers will be presented.

Submissions

Please submit your abstract by e-mail in MS word format to the technical committee at prres2015@gmail.com. All abstracts must be submitted not later than **31st August 2014** and should contain no more than 250 words, title of the paper, names, institutional affiliation, postal and e-mail addresses of all authors and two or three keywords indicating the topic.

For further information, please contact

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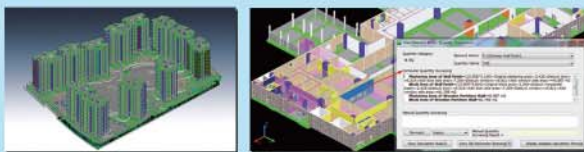
Updates on the conference will be available on the PRRES website

TAS



Glodon Takeoff for Architecture & Structure

TAS measures the quantity for the aspects of architecture & structure easily and rapidly by generating a 3D BIM model.

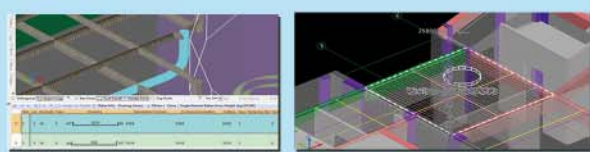


TRB



Glodon Takeoff for Reinforcement Bar

TRB measures the quantity of reinforcement bar, even displays the bar in "3D" Three-dimensional for easier reviewing.



TME



Glodon Takeoff for Mechanical & Electrical

No matter PDF or CAD drawings are on hand, TME measures the aspects of mechanical & electrical, such as HVAC, fire service, plumbing & lighting.

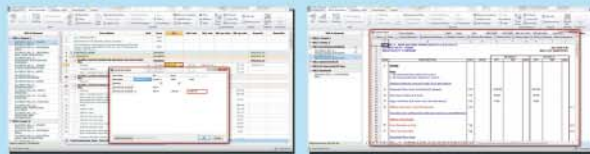


TBQ



Glodon Tender Series for Bill of Quantities

TBQ covers the whole process of tendering, and power-up its function by the integration of TAS, and multi-user accessing.



Solution

Glodon quantity surveying and cost estimating product series:

- ↳ Constitute a complete set of BIM solution
- ↳ Release from large and complicated manual measurement
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