

07 Issues and Challenges Faced by School Authorities in Maintenance of Institutional Heritage Buildings in Kuala Lumpur

*Cheong Piak Hong*

17 Surveying the Condition of a Selected Flat Roof for Possible Water Ponding Defect

*Adi Irfan Che Ani, Ahmad Sairi, Mohd Ikmal Fitri Marzuki, Mohd Zulhanif Abd Razak, Hafsa Yahaya*

33 FTSE NAREIT PureProperty® Index: A Solution to Having a Daily Direct Property Index?

*Ting Kien Hwa*

36 Stop your Cognitive Distortions to Reduce Stress

*W. M. A. Wan Hussin*

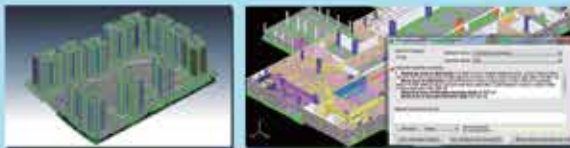


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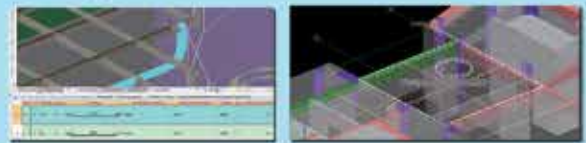


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# CONTENTS

## Peer Review Articles

Pg7 Issues and Challenges Faced by School Authorities in Maintenance of Institutional Heritage Buildings in Kuala Lumpur

Cheong Piak Hong

Pg17 Surveying the Condition of a Selected Flat Roof for Possible Water Ponding Defect

Adi Irfan Che Ani, Ahmad Sairi, Mohd Ikmal Fitri Maruzuki, Mohd Zulhanif Abd Razak, Hafsa Yahaya

Pg23 Employability Skills Among Quantity Surveying Graduates in the Construction Industry

Nurul Munirah Ahmad Mazuki

## Property Watch

Pg33 FTSE NAREIT PureProperty® Index: A Solution to Having a Daily Direct Property Index?

Ting Kien Hwa





25

### Managing Stress

Pg36 Stop your Cognitive Distortions to Reduce Stress

Wan Hussin W.M.A.

### RISM Activities

Pg39 17th International Surveyors Congress

Pg41 54th RISM Annual General Meeting

Pg43 54th RISM Annual Dinner

Pg45 Young Achievers' Award (YAA) National Competition 2015

### Regulars

Pg48 List of New Members



33



36



47



50

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# EDITORIAL

## **Call for Papers for the 50th Anniversary Special Issue**

Dear Members,

**G**reetings from the Editorial Board of The Malaysian Surveyor!  
We are pleased to inform you that The Malaysian Surveyor which was first published in December 1964 is reaching its 50th year of publication in December 2015. A 50th Anniversary Special Issue will be published in March 2016 to mark the Silver Jubilee.

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We look forward to counting you as one of our contributing authors.



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*Chief Editor, Editorial Board  
(Session 2013-2016)*

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# Issues and Challenges Faced by School Authorities in Maintenance of Institutional Heritage Buildings in Kuala Lumpur

Maintenance in heritage school buildings requires extra attention in order to preserve it in good condition. The intention of this study is to investigate the issues and challenges faced by the heritage school authorities in Kuala Lumpur during implementation of maintenance works. The research mainly focus on the maintenance cultures practised by the school authorities as an effect of implentation of the National Heritage Act 2005 (Act 645) may pose great impacts to building. It is a topic worth investigating as maintenance for local school buildings is extraordinary in comparison to other

general buildings, because non-technical personnel are usually appointed to carry out maintenance management. There were a few methods being used to study the issues and challenges faced by the school authorities. First and foremost, the interviewees from school authorities who were appointed as dedicated maintenance personnel have been involved in the interview regarding the existing maintenance management and practices. Correspondingly, there are also officers from National Heritage Department who had participated in the research to justify the issues and challenges highlighted by the school authorities, and their responsibilities to heritage education institutes after its declaration of National Heritage. Besides, condition surveys were conducted in selected building in case studies in order to evaluate the existing building condition and cross-analysed with feedbacks given by interviewee during the survey. In essence, building occupants such as school principal, senior assistants, senior clerks, class teachers, and other advanced building occupants, or those who affiliated with implementation of school maintenance in heritage school were queried in the form of questionnaire paper with regards to their perception on maintenance works in heritage school. The findings are presented in the context of issues and challenges from various aspects, which include financial problem, material replacement problem, unconcerned human behaviour, lack of institutional and training facilities, technical problem, poor management and administration, and effect on declaratory as national heritage. Surprisingly, one of the indicative findings from this paper is on National Heritage status that has raised the awareness of respondents to provide better care of buildings, and it does not lead to improvement in maintenance performance and physical condition of the schools compared to non-gazette heritage buildings.

**Keywords:** Gazetted Heritage, School Buildings, Maintenance Management, Educational Institution, National Heritage Act.

## 1.0 Introduction

Malaysia has many historical buildings and cultural significance that are worthy to be preserved for sustainable development; educational institutions are one of the most common historical buildings found is the heart of the Kuala Lumpur city. These historical schools have been operating over a few decades, or even one century, and gazetted as National Heritage status.

According to the statistic adapted from the list of secondary school by Ministry of Education (2011), about 24 of 94 schools has aged more than 50 years in Kuala Lumpur. Maintaining such architectures in good condition definitely will create a better image for Malaysia, and showing our respect to our history.

The general significance of this study is to improve the maintenance practices of heritage school building, which requires special maintenance approach to conserve the building as authentic as possible. Based on the findings by Rashid

et al. (2011), most of the maintenance practitioner agreed that maintaining historical buildings are more complex compared to new building.[1] Therefore, a good maintenance practice can lengthen the building's lifespan as to avoid the degree of degradation and decay. According to one of the newspaper that discussed on the issues on demolition of old school buildings, it can last for 100 years or more, and proposed demolition for old school buildings was unnecessary, and building maintenance was a more viable and economical solution. An example of Kuen Cheng girl's block, the

engineers mentioned that historical structures can be salvaged, claiming for 100 years or more. According to the research done by Zulkhiple A. Bakar as mentioned in the newspaper article suggested that to maintain a building would merely cost about RM5 million for life cycle costing, while redeveloping similar building required more than RM35 million. The interviewed engineers were also confident of the strength of the school buildings, and salvaging the structure will help them to save 40% of their project costs. [2] (The Star, 27 Nov 2006)

Regarding the maintenance cost of public school in Malaysia, the maintenance fund for public educational institute in Malaysia is usually allocated by the Ministry of Finance(MOF). However, it arises some issues as stated in online news by New Strait Times (2014), deputy education Minister II P. Kamalanathan mentioned that RM180.54mil were requested for building maintenance and repair, but only about 10% of requested amount was approved.[3] Similarly, as mentioned in one of the research papers of Zainal Abidin et al. (2009), the research suggests that 70% of the school communities do building maintenance without public funding provided by the federal government.[4]

The research was carried out in the city of Kuala Lumpur, and mainly focused on the maintenance management and practices in heritage education institutes with different school types, either national school or religious boarding school. Besides, the case studies chosen would be the school with a particular criteria, as stated in Section 67, that probably to be Gazetted as National Heritage. The existing maintenance practice of the selected heritage school will be determined through various perspective by interviewing appointed maintenance personnel. Besides, a series of questions was posed to the officers in National Heritage Departments to obtain relevant information on the conservation and maintenance approaches. Based on

**Table 1: Section in Act 645 that related to building maintenance**

Section	Item	Description
21(B)(iii)	Expenditure to be charged on fund	The fund may be expended for the conservation and preservation of any heritage item and activities
23(1)	National Heritage register	Establish and maintain a register known as the National Heritage Register
38(1a)	Care of the heritage	Make arrangements with the owner or occupier for the inspection, maintenance, conservation, and preservation of the heritage site
38(1b)		Commissioner may make a contribution towards the costs of carrying out any works of repair
39(1)	Inspection of heritage site	Owner the building shall permit the Commissioner to enter the site to inspect, survey, investigate, or carry out any work necessary for the conservation, repair, maintenance and cleanliness
42(1)	Duty to keep heritage site in good repair	Owner of heritage shall ensure that the heritage site is always in a state of good repair.
42(2)		If the owner failed to do it, the commissioner may carry out repair works by inform any person and all costs and expenses shall be reimbursed by the building owner.
43(1)	Financing conservation work	Owner of heritage sites may carry out any conservation and preservation works on the heritage site apply to commissioner for any grant or loan

method mentioned above, the issues and challenges were determined from various aspects.

## 2.0 Literature Review

Building maintenance is one of the essential plans to keep a building in good condition. By referring to BS3811, building maintenance is defined as the combination of various technical and management aspect carried out to preserve the functionality, protect and

recover the original usage of the particular item in BS3811 (British Standards Institution, 1993).[5] Maintenance works carried for historical building can preserve the distinctiveness of the particular building over the years (Amir Fahsa, 2010).[6] Government, who is responsible for school building maintenance, also defined building maintenance for the asset in General Order, No.2 1995, as one of the functions to be carried out to confirm its operations. [7]

The main objectives of maintenance management is to ensure that the physical resources are always productive and reliable. According to Queensland Government (2012), governmental building should plan a maintenance strategy that incorporates the balance of planned and unplanned maintenance in order to implement the maintenance works effectively, while planned maintenance defined as maintenance works done based on predetermined intervals, and unplanned maintenance only carried out after failure of building components[8]. For planned maintenance system, there are two (2) types of maintenance, namely preventive maintenance and corrective maintenance.

According to guidelines provided by Ministry of Finance (2007), implementation of public building maintenance as stated in General order No.2 Year 2007, there is a list of maintenance scope that are entitled to budget allocation from the government, which are:-

- a) Repainting works on building or any equipment's
- b) Maintenance of fencing, boundary, security post & entrance
- c) Maintenance of flooring, wall, and building façade
- d) Maintenance of roof, tiles, rainwater good & drainage system
- e) Maintenance and repair of toilet, piping system and sewerage
- f) Maintenance of electrical system
- g) Maintenance of perimeter drain and drainage system
- h) Maintenance of driveway and pavement
- i) Maintenance of landscape

Under the same guideline, Clause 4 stated that public buildings which the maintenance budget is not allocated annually by the government has limited opportunities to be entitled to get budget allocation for the maintenance task above. It means that if the public school buildings are not listed under school lists

**Table 2: Information on case studies**

Criteria	Case studies			
	G1	G2	N1	N2
Gazette Status by National Heritage Department	Gazetted Heritage Building		Non-Gazetted Heritage Building	
Heritage zone classification by KLCH	Category 2	Category 1	Category 3	None
Ownership	Public	Public	Private	Public
Year of establishment	1893	1904	1896	1917
Year of construction	1929	1907	1916	1917
Building age of heritage block	85	107	98	97

of entitlement of annual budget, it is not prioritised to get assistance for these maintenance works.

According to National Heritage Department (2012), a heritage building has outstanding universal value from the point of view of history, architectural significances, or homogeneity of their place in the landscape.[9] Old school building with colonial architectures can be considered as one of the heritage buildings due to early development of education in Malaysia and significant colonial architectural value. National Heritage department is not only conserving built environment, but also helping the owners to protect the heritage building condition. It proves that this department might have influences and impacts towards the building maintenance works in heritage school building.

National Heritage department also has the responsibility to enforce the provision under National Heritage Act 2005, which it includes some of the sections related to building maintenance after National Heritage declaration. The sections that may influence the heritage building maintenance is shown in Table 1. [10]

### 3.0 Research Methodology

This research aims to determine the issues and challenges on implementation of maintenance works in heritage school building. In order to achieve this aim, the researcher will look into the perspective of maintenance management, awareness on occupants in implementation of maintenance works, and also detailed condition survey of all the selected building. Hence, these three (3) methods will be used to achieve those objective, the findings will be analysed as to find out the issues and challenges.

In this research, the study will focus on heritage school building in Kuala Lumpur. Hence, there are four (4) heritage school building with various criteria, especially National Heritage declaratory status, year of built and establishment, and also building ownership were selected. The detail of chosen case studies are shown in Table 2.

It is believed that selection of case studies with different characteristics will generate a more reliable and outstanding outcome to this research, as these characteristics

might bring impact to the implementation of maintenance in these school building.

Three (3) different types of information will be obtained in order to achieve the objectives. Detailed interview will be conducted with the appointed maintenance personnel in each case study to obtain information maintenance management or system in their respective school. Besides, specific population in the school will be chosen to undergo questionnaires study on their perception on implementation of maintenance works. Last, condition survey will be conducted in

the heritage blocks of the school in order to record the existing condition of the heritage block through CPS1 method. To summarise, the targeted population and sampling to obtain relevant information is shown in Figure 1.

However, the aim of this research is to determine the issues and challenges of maintenance implementation in heritage school building, and hence, issues and challenges will be analysed through the findings, and cross-analysed or synthesised to get determine the actual problem on maintenance implementation.

## 4.0 Data Collection And Analysis

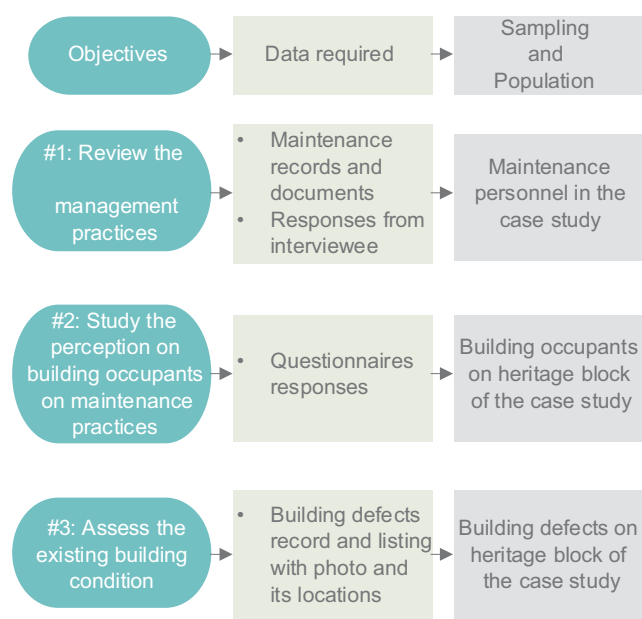
### 4.1 Review on maintenance management practices

The characteristics of heritage school building, comprising of National Heritage declaratory status, ownership, person in charge for maintenance, building occupants, documentation method, and funding sources will be analysed and tabulated in Table 3.

There are four (4) heritage school buildings taken into this comparison, the Gazetted Heritage Schools are labelled as G1 and G2 while the Non-Gazetted heritage school is labelled as N1 and N2. The information is adapted based on the occupancy in heritage block only. First of all, only N2 is owned by the government, while the others are owned by the non-governmental organisations in Malaysia. However, it does not affect the school operations in terms of learning and teaching syllabus, as everything is still under control and legislated by Ministry of Education (MOE).

**Table 3: Overview on maintenance management practice**

Characteristic	Description	Case studies			
		G1	G2	N1	N2
Heritage status	Gazetted	√	√		
	Non-Gazetted			√	√
Category of heritage building (DBKL)	Category 1		√		
	Category 2	√			
	Category 3			√	
	None				√
Type of school	National	√			
	Government aided		√		√
	Non-Government aided			√	
Funding Sources	Parent-teacher association funding	√			
	Board of governors	√	√	√	√
	Alumni donation event	√	√		
	Jogothon fund raising			√	√
	Mubaligh school aid		√		
Percentage of government funding on maintenance	0%			√	
	5 - 10%				√
	10% - 15%	√			
	15% - 20%		√		
Person in charge for maintenance	School Principal	√	√	√	√
	Senior assistant (Student affairs)	√		√	
	Chief administrator		√		√
	General technician	√			
	Maintenance teacher			√	√
	All teachers			√	
Approximate number of occupants	Senior assistants & teachers	103	10	52	81
	General staff	22	18	12	9
Documentation Method	Defects record folder	√	√	√	√
	Work quotation folder	√	√	√	√
	Maintenance log book			√	√



**Figure 1: The summary of the data required for these objectives**

If the school authority fail to get assistance from the government, they will consider to repair it by using school funds. The suitable contractor for repairing works will be appointed if there is sufficient school fund and upon consent by Board of Governors of the school. If the repairing costs is too expensive and unaffordable by using the school funding, contractors who are cheaper and suit to perform similar repair works will be appointed. However in N1 School, the school authority has sought for financial aid and organised fund raising event exclusively for the repairs if there were insufficient funds.

### 4.2 Building Condition Surveys

Based on the COPBS101 matrix calculation done in the research, the matrix is further calculated with the number of defects, BARIS assessment has done for each studies as shown in Table 4.

In general, the overall building rating for all case studies range from 4.15 to 4.62, which is at boundary between good and fair; good is defined as very few defects need to be rectified, and fair is defined as needs immediate repair and organise maintenance. On the other hand, the National Heritage status has no impact on the overall building rating, as one of the Gazetted heritage schools is rated good while another is rated as fair, and similar to Non-Gazetted heritage school.

### 4.3 Questionnaires Analysis

Questionnaires study was carried to determine the perception of respondents in implementation of maintenance works. A total of 100 sets of questionnaires were distributed evenly to each of the case studies, but only 72 completed sets were returned back for the collation and analysis.

Firstly, the comparison between Gazetted and Non-Gazetted heritage building in terms of building occupants awareness

**Table 4: Overview on maintenance management practice**

Building Assessment Rating System (BARIS)	
<b>(a) G1</b>	
Total marks [d] ( $\sum f c$ )	610
Number of defects [e]	132
Total score (d/e)	4.62≈5
Overall building rating	Fair
<b>(b) G2</b>	
Total marks [d] ( $\sum f c$ )	249
Number of defects [e]	60
Total score (d/e)	4.15≈4
Overall building rating	Good
<b>(c) N1</b>	
Total marks [d] ( $\sum f c$ )	319
Number of defects [e]	73
Total score (d/e)	4.37≈4
Overall building rating	Good
<b>(d) N2</b>	
Total marks [d] ( $\sum f c$ )	399
Number of defects [e]	86
Total score (d/e)	4.64≈4
Overall building rating	Fair

If the school authority fail to get the assistance from government, they will consider to repair it by using school funds.

is shown in the next page Figure 2. Most of the building occupants in Gazetted heritage school generally perceive the appropriate actions should be taken when they discovered building defects, which accounted for 60.60%. On the other hand, 66.67% of occupants in non-Gazetted heritage school do not perceive the appropriate actions should

be taken. Relevantly, building occupants in Gazetted heritage school tend to have higher percentage who have applied for building maintenance and repairs in the past, which is 84.85%, whilst for the occupants in non-Gazetted heritage school, the percentage is almost equal as 48.72% have done the application and 51.28% have not done.

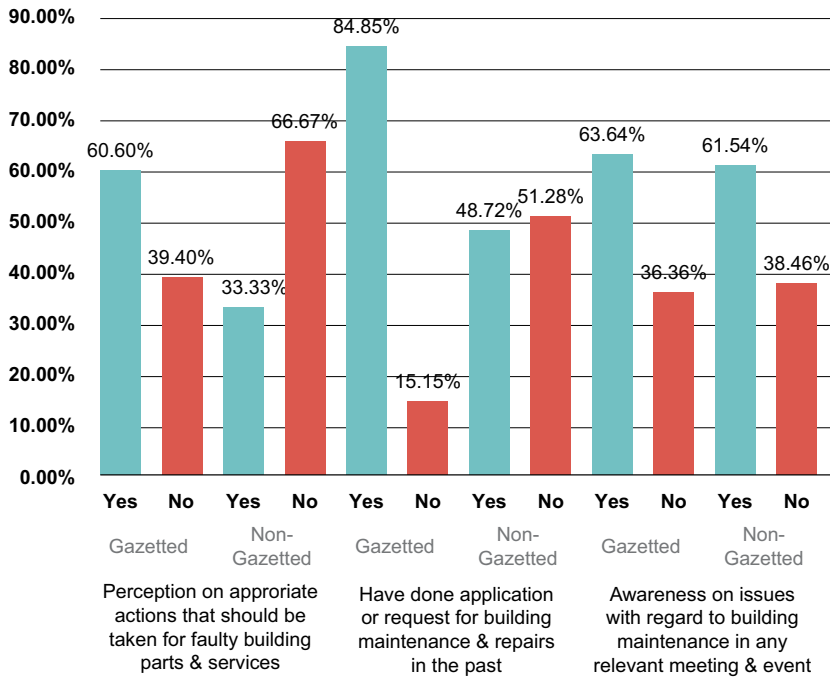


Figure 2: Comparison of general perception on building maintenance for gazetted and non-gazetted heritage school

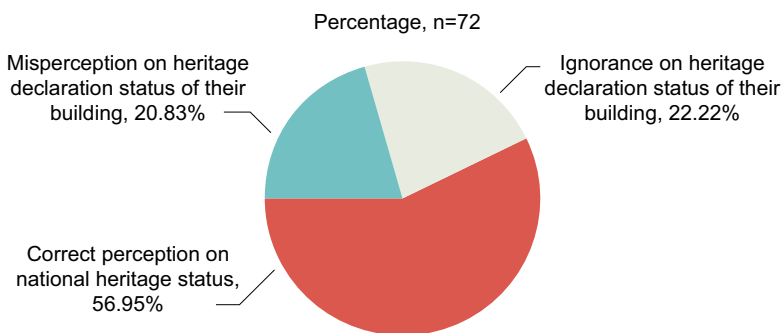


Figure 3: Respondents' perception of declaratory status of National Heritage for gazetted and non-gazetted heritage school

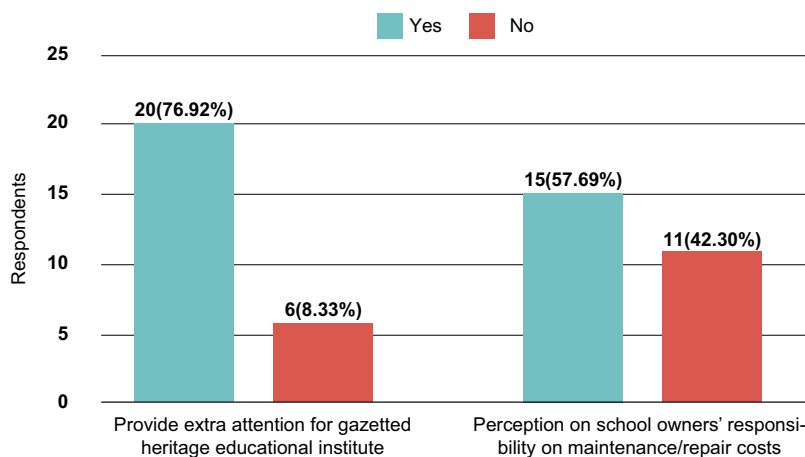


Figure 4: Specific questions for respondents with right perception in Gazetted Heritage Education Institutes.

For Gazetted heritage building, which are G1 and G2, its declaratory status is widely known by the respondents as they're conscious that their building has been declared as National Heritage, making up to 94.11% and 62.50% of right perception respectively. For G2, 18.75% of the respondents admit that they are ignorance on National Heritage, while another 18.75% of the respondents misperceive that their building have not been Gazetted. As for non-National Heritage case studies, N1 has much better perception on their building status, accounted for 61.11% of right perception, while misperception and ignorance accounted for 11.11% and 27.77% respectively.

The worst responses happened in N2, with only 19.05% of the respondents perceive the building status correctly. Misperception and ignorance accounted for 42.86% and 38.09% respectively. Generally, building occupants in heritage school building has better perception with regard to the building status, which is 78.79% of right perception, whilst non-heritage school accounted for only 38.46% of right perception. In sum, 72 respondents are classified into three (3) different category as shown in Figure 3 with its percentage accordingly.

Samples from correct perception and ignorance on their declaratory status of their building are taken into the following studies, which 41 respondents or 56.94%, are taken into two (2) different series of question, as shown in Figure 4 and Figure 5 respectively.

By knowing the facts of their building has been gazetted as national heritage, 76.92% will provide extra attention on building maintenance for their gazetted heritage educational institute, and merely 8.33% will not guarantee for it. One of the respondents noted that the school staffs and occupants should keep the building in state of good repair as written in National Heritage Act. It means that such enforcement definitely will increase occupant's interests to be more aware on building condition. Whilst for funding responsibility on maintenance or repair

costs, only 57.69% realise that school authorities are entitled to pay for repair costs if it is not preserved and maintain properly, while 42.30% did not realise it.

By knowing the facts of their school has not been gazetted as national heritage, 86.67% agree that their building to be gazetted as heritage educational institute, as some of them comment that it can improve school and building performance. On the other hands, majority of the respondents disagree that school to be funding responsible for building maintenance and repairs, which accounted for 73.33% of disagree and while only 26.67% agreed. Hence, building heritage status might make different on building maintenance performance and condition due to occupants' awareness to protect and preserve the heritage building. Besides, the respondents noted that school itself is financially responsible for maintenance and repair costs, but they deem that it should not be only responsible for one party, perhaps government can allocate extra budget on maintenance for gazetted heritage educational institution.

Comparison of influential factors between the Gazetted and the Non-Gazette heritage education institutes is shown in Figure 6.

At a glance, the Non-Gazetted heritage educational institutes rated financial status and building heritage status as higher level importance compared to the Gazetted Heritage educational institutes. For instance, financial status is rated as 0.79 is non-Gazetted heritage school but only 0.68 in Gazetted school. Besides, building heritage status rated higher by the respondents in non-Gazetted school, which is 0.64 compared to Gazetted school, as it is only 0.49. On the other hands, the respondents in Gazetted school rated other factors, such as technical provisions, availability of material replacement, and human behaviour & attitudes as more influential factors compared to the respondents in non-Gazetted school. Whilst for management & administration,

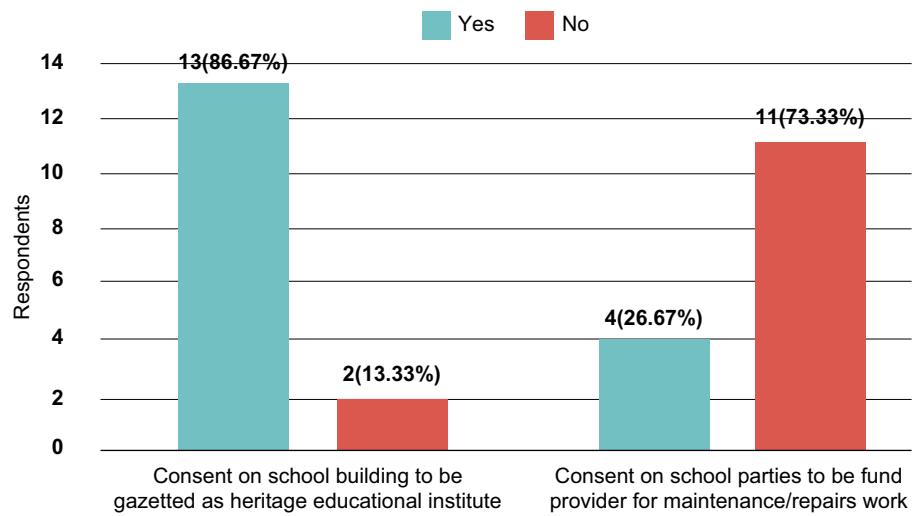


Figure 5: Specific questions for respondent with right perception in non-heritage school

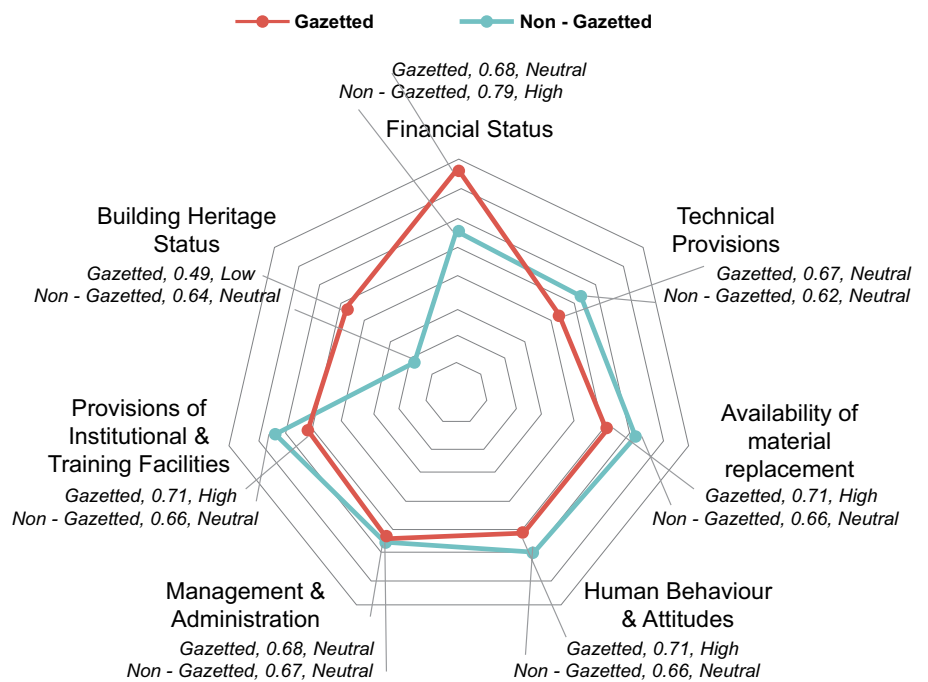


Figure 6: Relative important index (RII) of influential factors between Gazetted and Non-Gazette heritage educational institutes rated by the respondents

respondents in both heritage school groups have similar perception of importance, which is are both 0.68.

To summarise, all of these factors are ranked according to relative importance index (RII) rated by the respondents show in Figure 9.

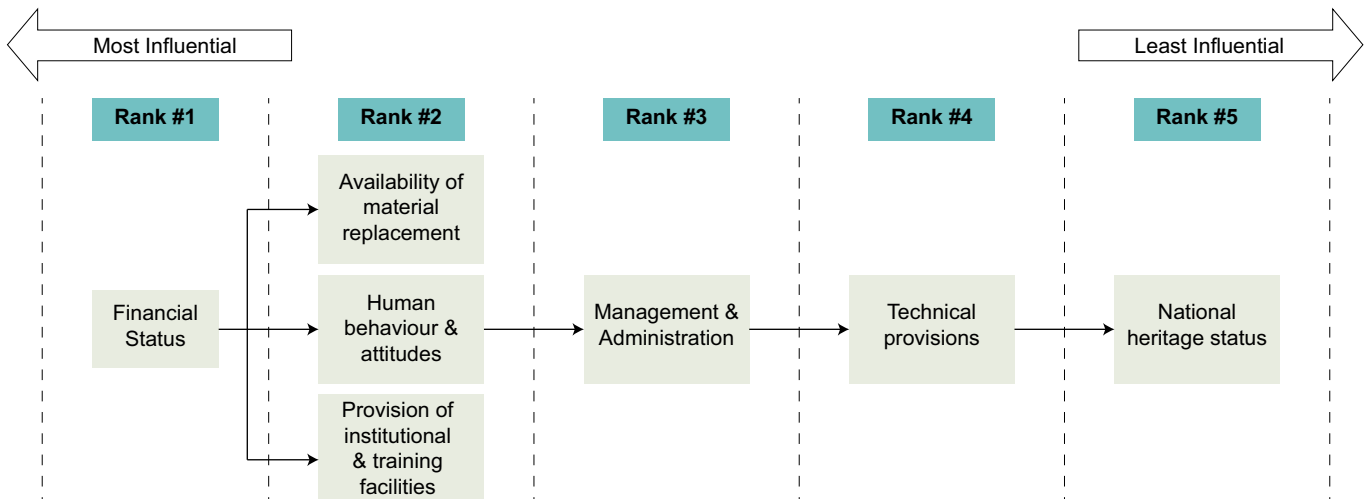


Figure 7: Overall ranking of all influential factors.


### 3.0 CONCLUSIONS

Heritage school buildings in Kuala Lumpur generally have poor maintenance practices mainly due to limitation of maintenance funds to carry out maintenance work. School authorities have limited income generated from reliable financial source, adding that government are not financially contributing for school maintenance.

As for questionnaires study, which the questionnaires have randomly been distributed to the building occupants with various demographic information and experiences in building maintenance. Their awareness of school building maintenance are analysed, notably that more than half of the respondents do not perceive the appropriate actions should be taken for faulty building parts, though majority of them have done their obligation in applying and request for building maintenance and repairs to the school authorities in the past. Most of them also aware on the issues with regards to building maintenance in any relevant meeting and events. To put it in another way, respondents from Gazetted heritage school building usually have more awareness from these aspects compared to respondents in non-Gazetted heritage school.

It is important to realise that more than half of the respondents have perceived correctly on the National Heritage status of their building, either Gazetted or Non-Gazetted. Most of the respondents from Gazetted heritage building notably proving extra attention to keep the building in state of good repair, and too perceived that school authorities are financially responsible for heritage school maintenance. Notwithstanding, the respondents from Non-Gazetted heritage school also consent on their school to be Gazetted for better maintenance service delivered, and they disagreed on school authorities as the only financial provider for implementation of maintenance works.

Based on perception of the respondents, financial status notably rated as the most influential factors for implementation of heritage building maintenance as a result from overall questionnaires analysis, instead availability of material replacement in Gazetted Heritage School. However, it is surprised to know that the respondents rated the National Heritage status as the least influential factors to implement successful maintenance works while it is equally important as other factors.



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Besides, the study has gone some ways towards understanding the limitation of school staffs to deliver great maintenance management in heritage educational institution, hereby it is proven that they might not be the appropriate candidates that are selected to carry out particular maintenance work. As concluded from the findings, school staffs might be lacking in awareness on implementation of maintenance works due to ignorance, and not exclusively assigned for maintenance without other responsibilities. For instance, senior assistants in the case studies usually act the vital role in school maintenance, whilst they are busy with other tasks, such as student affairs, school activities, teaching, and so on. It shows that building maintenance in heritage educational institutes are highly recommended to be done by other parties.

This point is particularly relevant to literature review, as the government does not initiate to manage the school maintenance efficiently, though there have been high amount of budget being allocated for education facilities maintenance each year. The finding from also research in school authorities that the they failed to get the allocated budget due to poor understanding on maintenance application funds that are usually done by school authorities. Adding that they lack of awareness, they are not suitable to be maintenance manager, therefore, the maintenance works should be initiated by the maintenance team from local education authorities.

As a recommendation, maintenance team that are specifically for heritage educational institution should be provided by the local education authorities to rotate over the schools throughout Malaysia. This maintenance team should have the expertise in maintaining heritage building that are sufficient to maintain the originality of these institutions. They also shall be financed by using the allocated budget that are adequately distributed by the local government. Perhaps this is one of the best solutions for poor maintenance practices in the school, by appointing the right person for the maintenance team.

There are number of advantages if this method is adapted for implementation of heritage educational institution. Formation of heritage institution maintenance team can be of advantage in terms of cost, efficient, manpower, quality and also time aspects to both school authorities and local education authorities. A more plausible explanation for this recommendation is maintenance personnel from public work department attending to the serious defects in the school building, will be more beneficial when these two (2) parties work together to achieve same objectives.

In the research, it has been discussed that the heritage building owners are entitled to get free consultation from National Heritage department in various aspect. The non-Gazetted heritage school can consider to apply their school for declaration as a series of benefits will be brought to the school building. According to interviewee NH2, all case studies in the research has fulfilled the requirements of act 645, which is section 67 (a) and (b), historical importance, association with or relationship to Malaysia history, and good design or aesthetic characteristic. Hence, it is advisable for the non-Gazetted heritage

To put it in another way, respondents from Gazetted heritage school building usually have more awareness from these aspects compared to respondents in non-Gazetted heritage school.

school to apply for National Heritage status as there are more advantages than disadvantages. ▽

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# Surveying the Condition of a Selected Flat Roof for Possible Water Ponding Defect

Water ponding on a flat roof can slowly weaken the roof structure. As it is one of the main sources of moisture problems in buildings, it has become an important issue that should be addressed immediately. This study was conducted to identify the potential location of water ponding and its possible causes on an academic building located in Penang, Malaysia. The selected flat roof was built from concrete slab. Data were collected by conducting a building survey (visual inspection) on the flat roof surface of the building. Then a pictorial and written report was produced to facilitate the analysis. There are 12 points of rainwater downpipes (RWDP) that have been identified as potential locations of water ponding. The result shows that there are three criticality levels of water ponding, namely, low, medium, and high. From 12 RWDP points, two are categorized as having a high criticality level. The possible cause of water ponding

is the presence of deposited dirt around the RWDP area, reaching a height of 35 mm. Cleaning the dirt in these areas ensures the smooth flow of rainwater into the drainage system. However, routine inspection of flat roofs is difficult to implement, especially for the purpose of detecting the presence of water ponding at any real point of time. Theoretically, this paper suggests the use of automatic sensor technology as one of the best approaches to achieve real-time detection of water ponding on a flat roof.

**Keywords:** roof, condition assessment, water ponding, rainwater downpipe, criticality index.

## 1.0 Introduction

The roof is the main protection component of a building. There are two types of roofs, namely, pitch roof and flat roof. Compared with the pitch roof, the flat roof has a slope that is less than 10 degrees; thus, many activities can be performed on top of it. However, such advantage comes with one common problem: water ponding. Water ponding is a serious problem that can lead to other defects on a building. For example, water ponding on lightweight flat roof can cause collapse if the applied load is excessive. Moreover, water ponding is the main source of moisture on a flat roof made of concrete slab.

To address this issue, we conducted a study on the condition of the flat roof in one of the academic buildings in Penang, Malaysia. The aims of the study are to identify the potential location of water ponding and its possible causes. The selected building has a concrete slab flat roof, which is considered a heavyweight roof.

## 2.0 Literature Review

The roof is the main protection component of the building and protects the internal space from natural factors, especially rainwater and sunlight (Zuraida, 2010). The roof also acts as indoor environment controller (Nurfatiha, 2008).

As a main building component, the roof is vulnerable to defects and must be maintained along with the other building components. Therefore, it is important to ensure that every roof functions properly through an effective monitoring process.

Hakim and Min (1991) reported that the use of flat roofs in Malaysia has increased in recent years. There are many advantages of using a flat roof; however, there is one main problem often associated to a flat roof: water ponding. Water ponding is the presence of stagnant water on flat roof surfaces during or after rainfall. The failure of a building's rainwater drainage system is the main cause of water ponding. Wijte (2006) reported that the failure of the regular rainwater drainage system can be on the roof itself or within the drainage system.

***"For a given return period, the maximum rate of runoff will result from a storm event in which the duration of the peak intensity is equal to the time of concentration, which is the minimum time for the whole area of the roof contribute flow to the point of discharge. A time of concentration of 2 minutes is considered typical for many roofs"*** - British Standard (2000)

Based on the statement above, water trapped on roof surfaces for more than 2 minutes is considered water ponding. Water ponding is a building defect because its existence is caused by a failure of a building component, in this

case, the drainage system (Wijte, 2006). Although the National Roofing Contractor Association (NCRA) believes that the short duration of water ponding (less than 48 hours) is acceptable (Wilén, 2012), it is still considered a defect because short-term water ponding can ultimately lead to building disaster in the long term (Snijder, 2006; Blaauwendraad, 2006; Lawson, 2012).

For a flat roof made of concrete slab, water ponding usually does not have immediate effects that can lead to a building disaster if the structure is strong enough to accommodate the load. However, Eldridge (1976) stated that its moisture effect will slowly weaken the building's material strength. Recurrent water ponding can worsen the moisture effect and eventually weaken the building's structure. Thus, it is important to identify possible locations of water ponding on a flat roof surface so as to overcome other related problems that can endanger the building and its occupants.

## 3.0 Research Method

The condition survey was carried out on the selected flat roof of an academic building in UiTM, Pulau Pinang, on 19 September 2014. The objectives of this survey were to identify the flat roof condition and to detect the possibility or likelihood of a water ponding problem. The survey was done to carry out a visual inspection and produce a pictorial and written report. The survey area involved

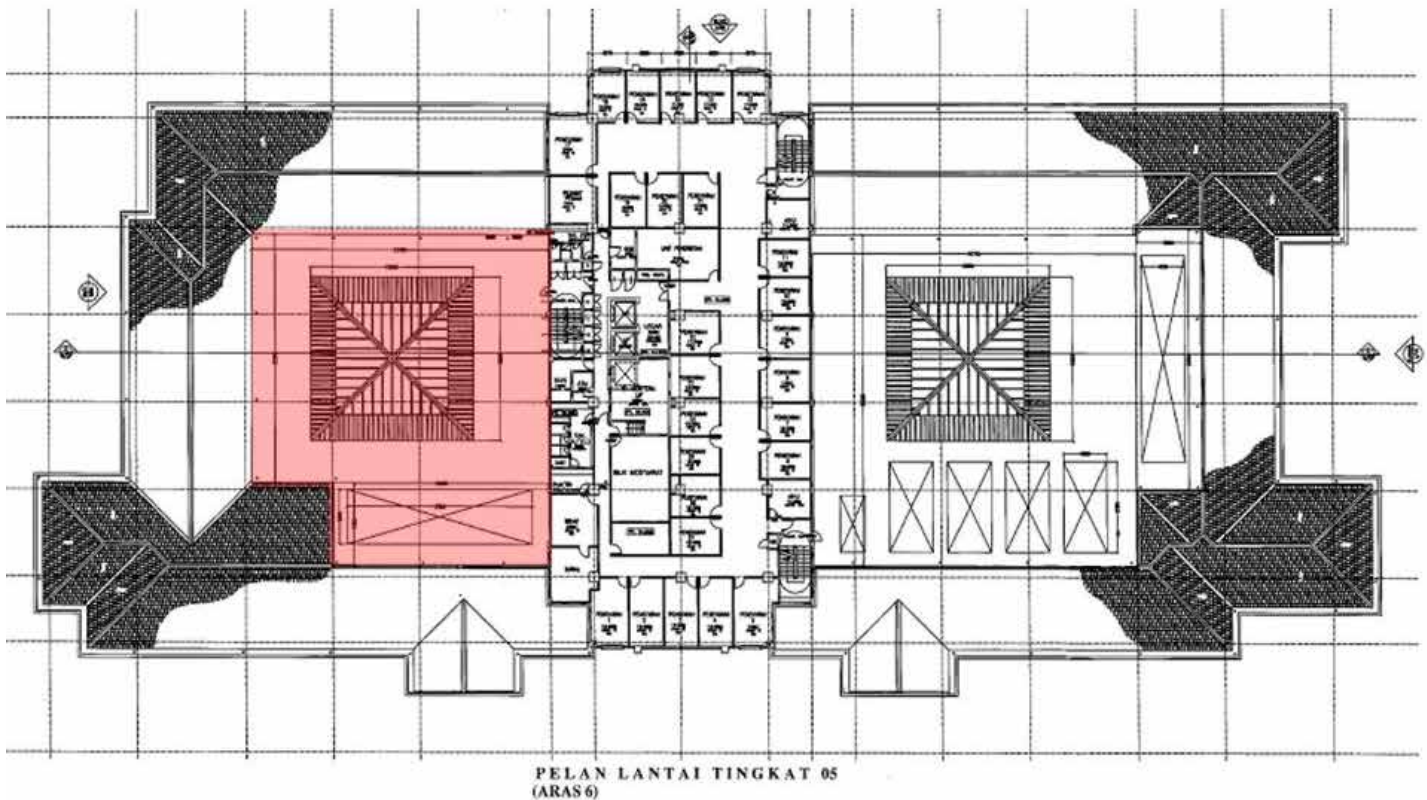


Figure 1: Flat roof layout plan and survey area

600 m<sup>2</sup> of flat roof area consisting of 12 points of rainwater downpipe (RWDP). The area involved in the survey is shown in Figure 1.

This survey was carried out using visual inspection. The overview and existing condition of the survey area was recorded using a camera. The survey area was measured using a measuring tape and laser distance meter, and the number of RWDP was recorded. Figure 2 shows the survey area and overview of the existing condition of the flat roof. The number of RWDP points is also labeled in Figure 2.

General building inspection was carried out to determine the existing condition of the flat roof and to identify any possibility of water ponding and watermark on the flat roof surface. It also aimed to determine the presence of dirt around the cages of RWDPs, which might cause water ponding on the flat roof surfaces. The height of water ponding and dirt were

measured using a ruler. The findings were summarised according to the criticality of each RWDP point, which was scored as low, medium, or high.

#### 4.0 Findings and Discussion

It was a sunny day when the survey was conducted, although heavy rainfall was recorded 10 hours before the survey was conducted. During the visual inspection, water ponding and watermarks have been identified on several areas of the flat roof surface. Dirt has been identified on the gutters, and the dirt level reached 25 mm to 35 mm. However, there is no water ponding on the surface area of the flat roof near RWDPs 1 to 5, as shown in Figures 3 to 7, respectively.

Water ponding has also been identified on the flat roof surface near RWDPs 6 and 8. Water ponding level on this area reached

a height of 30 mm to 35 mm. There was also a watermark on the flat roof slab near this area at 30 mm. Dirt has been identified on RWDPs 6 to 8, with the dirt level reaching 35 mm to 40 mm. Figures 8 to 10 show the respective conditions of these flat roof areas.

The surface areas of the flat roof near RWDPs 9 to 12 do not show water ponding. However, dirt and mold growth has been identified in these areas. This finding can be attributed to the stagnant water trapped at the surrounding RWDP points, which creates deposits of dirt. Dirt level in this area reached 25 mm to 35 mm. This area shows the water ponding effect, because the area is near the water tank blocked by direct sunlight. Figures 11 to 14 show the respective conditions of these flat roof areas.

Based on the observations on the next page, water ponding that occurs in this flat roof area is caused by deposited



Figure 3: Condition of RWDP 1



Figure 4: Condition of RWDP 2



Figure 5: Condition of RWDP 3



Figure 6: Condition of RWDP 4



Figure 7: Condition of RWDP 5



Figure 8: Condition of flat roof surface near RWDP 6 showing the existence of water ponding



Figure 9: Condition of flat roof surface near RWDP 7 showing a watermark on the flat roof slab ponding



Figure 10: Condition of flat roof surface near RWDP 8 showing the existence of water ponding





Figure 11: Condition of RWDP 9



Figure 12: Condition of RWDP 10



Figure 13: Condition of RWDP 11



Figure 14: Condition of RWDP 12

dirt around the RWDP areas. Rain water does not efficiently flow through the RWDPs due to the presence of dirt, and perhaps the flat roof surface is not well directed to the respective RWDP (inefficient flat roof fall). In order to support this argument, water ponding test was carried out on RWDP 2. The water was poured to the RWDP 2, and indeed we found that the flow was slow (not efficient) due to the presence of dirt around it. Once the dirt was cleaned, the water efficiently flowed through it. Figures 15 and 16 show the comparison of water flows before and after cleaning the area surrounding RWDP 2, respectively.

In order to identify the most critical RWDP in this flat roof area, Table 1 shows the criticality level of all RWDPs in term of presence of water ponding, dirt, and height of dirt.



Figure 15: Inefficient flow of water due to the presence of dirt around RWDP 2



**Figure 16: Efficient flow of water after cleaning the dirt around RWDP 2**

Based on the table, RWDPs 1, 3, 5, 9, 10, and 11 are categorised as having low criticality level due to the absence of water ponding and the presence of dirt level between 1 mm–25 mm. RWDPs 2, 4, 7, and 12 have medium criticality due to the absence of water ponding and the presence of dirt reaching 26 mm–35mm. Thus, it is possible for water ponding to occur near this RWDP because of the high amount of dirt in these areas.

RWDP 6 and 8 are categorised as having high criticality level due to the presence of water ponding and the presence of dirt reaching more than 35 mm. Comparing the conditions of these two RWDPs, RWDP 8 is in the most critical level because it shows high reading of dirt height, which is 40 mm. Thus, it is possible for critical water ponding to occur near this RWDP during heavy rainfall.

## 5.0 Conclusion

The result of this survey shows that water ponding definitely occurs on this flat roof area after heavy rainfall. Watermark signs on the flat roof slab show that water does not efficiently flow through the RWDP during heavy rainfall, thus causing water ponding. This survey also identified that the presence of dirt around the RWDP serves as a crucial factor that blocks to the efficient flow of water from the roof surface to the drainage. Out of 12 RWDPs surveyed, two have high level of criticality, namely, RWDPs 6 and 8. The most critical RWDP is RWDP 8, which has water ponding and dirt level of 40 mm. Hence, regular cleaning of the areas surrounding these RWDPs can mitigate this problem. Furthermore, to facilitate real-time monitoring of water ponding in these areas, sensor technology can be used even during rainfall. It is important to prevent water ponding defect, which can lead to serious defects on the flat roof that, in turn, can eventually weaken its structure. ▽

**Table 1: Criticality level of all RWDPs**

No.	RWDP	Water ponding near RWDP (Yes or No)	Presence of dirt (Yes or No)	Height of dirt (mm)	Criticality* (Low, Medium, or High)
1	RWDP 1	No	Yes	25	Low ●
2	RWDP 2	No	Yes	30	Medium ●●
3	RWDP 3	No	Yes	25	Low ●
4	RWDP 4	No	Yes	35	Medium ●●
5	RWDP 5	No	Yes	25	Low ●
6	RWDP 6	Yes	Yes	35	High ●●●
7	RWDP 7	No	Yes	30	Medium ●●
8	RWDP 8	Yes	Yes	40	High ●●●
9	RWDP 9	No	Yes	25	Low ●
10	RWDP 10	No	Yes	25	Low ●
11	RWDP 11	No	Yes	25	Low ●
12	RWDP 12	No	Yes	35	Medium ●●

\*Criticality:

- Low ● : No water ponding, dirt 1 mm –25 mm
- Medium ●● : No water ponding, dirt 26 mm –35 mm
- High ●●● : Water ponding, dirt more than 35 mm

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# Employability Skills Among Quantity Surveying Graduates in the Construction Industry

In this 21st Century the development of graduate employability skills is a necessity for prospective quantity surveying (QS) graduates. Graduate applicants looking for their first career jobs do not necessarily possess employability skills required by employers. Employability skills refer to skillsets in preparation for graduates to successfully obtain employment and develop their careers. In order to meet the exacting challenges of today's workforce, graduates should acquire the employability skillsets for continuous development of new competencies aside from being adaptive and flexible to exigencies brought about by change. A study was conducted to explore the importance of employability skills of quantity surveying graduates through the employers' perspective, which also serves as its main purpose. It was also to determine the various elements of employability skills needed for quantity surveying graduates, as the employment

competition has become decidedly more challenging in the current global market place. An online questionnaire survey was distributed randomly by email to QS firms to collect data, which was later analysed by using statistical software. The respondents consisted of 33 employers in QS firms in Malaysia in order to obtain their own perspectives regarding this study. The results show that employers put high levels of interest on employability skills of prospective quantity surveying graduates. It is thus evident that quantity surveying graduates need to be well-prepared in order to fulfill most of the employer's requirements which include the following skillsets: interpersonal, personal quality, teamwork, information and communication technology (ICT), as well as basic skills and resource skills.

**Keywords:** employability skills, employers, quantity surveying graduates.

## 1. Introduction

There are a variety of interpretations of the terms of employability skills of graduates. Employability skills are to prepare graduates to obtain employment and develop a career successfully in the future in the industry (Fugate, Kinicki, and Ashforth, 2004). Employability skills of graduates is widely regarded as the possession of graduates in terms of the level of skills and attitudes, the ability to use their skills to find work and retention (Nabi, 2003). The skills to employability were often regarded as the most important raw material of the organization (Perry, 2003).

In Malaysia, the MQA (2006) in the Malaysian Qualifications Framework (MQF), outlined eight domains skills to be mastered by graduates before entering the industry, which are knowledge in the areas studied, practical skills, social skills and responsibility, the value, attitude and professionalism, communication skills, leadership and teamwork, scientific problem-solving skills, entrepreneurial and management skills, lifelong learning skills and information management. Mohammad Sattar (2009) referred to employability skills as the ability of non-technical and occupational skills

being as important as technical skills. In addition, (PAQS, 2001) developed and recommended eight skills or competencies that were required practically for quantity surveyors by the institutes in Japan, Malaysia, Hong Kong, Australia, New Zealand, Fiji and Sri Lanka which covered Quantification/ Measurement, Communication Skills, Personal and Interpersonal Skills, Business and Management Skills, Professional Practice, Computer and Information Technology, Construction Technology, Construction Law and Regulation. The employers in the industry said that technical graduates in Malaysia have sufficient technical skills, but employers are still not satisfied with the communication skills, interpersonal, critical thinking, problem solving and entrepreneurial skills possessed by graduates (Ramlee, 1999).

There are 80,000 technical graduates in the country who are still unemployed, and graduates largely depend on academic qualifications to get a job, but many have little non-technical or generic skills necessary to employers (Ahmad Zaini, 2005) in the construction industry. According to the Economic Planning Unit (2006), unemployment rose from 3.1% (2000) to 3.5% (2010). The recent data by the Malaysia Economic In Figures (2013), indicated unemployment rate in year 2011 until 2013 based on (EPU, 2013) to be

There are 80,000 technical graduates in the country who are still unemployed, and graduates largely depend on academic qualifications to get a job, but many have little non-technical or generic skills necessary to employers

3.1% (2011), 3.2% (2012), 3.1% (2013). In addition, according to The Statistics Portal, the latest of unemployment rate in year 2014 are 3%. Therefore, we can see that the rate of unemployment in Malaysia is not below than 3%, making the issue of employability a pressing concern.

The objective of this study is outlined as:

- To examine the importance of employability skills from the employer's perspective;
- To determine the elements of employability skills needed for quantity surveying graduates

This research thus explores on employability skills which affect unemployment of graduates, in not achieving what the employers need for graduate's employment.

## 2. Employability Skills

### 2.1 Definition of Employability Skills

Employability skills can be defined as "transferable core skills" required in the fields of job in the 21st century workplace because employability skills are necessary for career success at all levels of employment (Overtoom, 2000). According to Johannes (2008), employability skills can be interpreted from three perspectives; public, employers and workers. From the perspective of society or public, employability skills are defined as indicators of opportunity for people to get jobs. This is different from the employer's perspective, who defined employability skills as indicators of opportunity to balance supply and demand across organizational change. Meanwhile, in the context of an individual or an employee's perspective, employability skills are defined as instructional opportunities for individuals to find employment in various types of jobs.

### 2.2 Importance of Employability Skills

According to Brown (2002) and Mohamad Sattar et al. (2009), employability skills

are very important for the individual and also in the organisation. However, its importance is different depending on the employers. Reviews by Hawthorne (2007) based on the employers' perceptions, the combination of skills, education, experience, good attitude, and the ability to increase productivity in a long run, may increase the potential for working individuals who will be employed by the employer. Ahmad Muhaimin, Jamaluddin and Baharudin (2008) stated that the increase in job demand in industry is not only required for those who have academic qualifications and technical skills but they must also possess employability skills. The construction industry currently has become extremely competitive, challenging and technology can make job performance very translucent. Chang (2004) revealed that employers only want to hire employees who can contribute to the team successfully. This is because when employees have all the skills of employability, most likely employees can give ideas, explain topics and issues, able to communicate in a constructive manner, able to solve problems, able to understand the events and issues faced by the companies, and able to come up with viable solutions to problems. Graduates with better employability skills and attitudes that has been valued by employers would also succeed in developing their potential in the job markets.

### 2.3 Types of Employability Skills Required By Employers

#### 2.3.1 Interpersonal Skills

The first employability skill to be considered as most required by employers is interpersonal skill (Mohamad Sattar, Rose Amnah, Ahmad Rosli, 2014), because interpersonal skills are the goal-directed behaviours used in face-to-face interactions and are effective in bringing the desired state of affairs and interaction (Hayes, 2002).

Some researchers mentioned communication skills as one interpersonal skill, which is a skill that enables a wide variety of communication (Lee, 2003; Mohamad Sattar, Rose Amnah, Ahmad Rosli, 2014). According to Verma (1995), the main component of interpersonal

skills is communication, because effective communication will help to accomplish interpersonal acceptance, develop teamwork and team motivation (Azim et al., 2010). However, other researchers separated communication skills from interpersonal skills and were not included under interpersonal skills (SCANS 2001; The Conference Board of Canada 1996; Kearns 2001).

Knowing that interpersonal skills are mainly open to working with people, individuals will thus need to possess leadership skills to guide others (Mohamad Sattar, 2009). So leadership skills are also required by employers (The Conference Board of Canada 1996; SCANS 2001; Kearns 2001), as this skills represent continuous accountability and relate to the capacity to work autonomously (Mohamad Sattar, Rose Amnah, Ahmad Rosli, 2014). Therefore, communication skills and leadership skills for the purposes of this study has been included under interpersonal skills.

#### 2.3.2 Teamwork Skills

Teamwork skills were the second employability skills to be considered as most required by employers (The Conference Board of Canada 1996; SCANS 2001; Kearns 2001). Teamwork skills is the skills and attributes that are needed to contribute productively to a company or organization (Mohamad Sattar, Rose Amnah, Ahmad Rosli, 2014).

#### 2.3.3 Thinking Skills

The third employability skills considered as most required by employers are thinking skills (Mohamad Sattar, 2009). According to him, thinking skills also included problem solving skills of the employees, think creatively/innovatively, know how to learn, able to visualise and make decisions. Therefore, in this study, creative / innovation skills and problem solving skills will be included under thinking skills (The Conference Board of Canada 1996; SCANS 2001; Kearns 2001; Ab Rahim and Ivan 2007).

#### 2.3.4 Resource Skills

Resource skills were the fourth employability skills considered as most required by employers, which are about management (Muhammad Sattar, 2009)

of the company. Some researchers also revealed that skills about management are important and required by employers which further refer to self-management and time management (The Conference Board of Canada 1996; SCANS 2001; Kearns 2001; Lee 2003). However, Mohamad Sattar (2009), also included material and facilities management, risk management and financial management under resource skills.

### 2.3.5 Basic Skills

The fifth employability skills considered as most required by employers are basic skills, which refer to the skills needed as a base for future evolution (The Conference Board of Canada, 1996). For example, basic skills included listening, reading, writing, speaking, mathematics and arithmetic which are considered as the most basic things required by employers (Mohamad Sattar, 2009).

### 2.3.6 Personal Quality Skills

The sixth employability skills considered as most required by employers are personal qualities skills, which essentially refer to general personal skills, behaviours and natural processes that drive a person to grow their potential (The Conference Board of Canada, 1996). This skill is thus related to integrity & honesty, important attributes for employees (The Conference Board of Canada 1996; SCANS 2001; Kearns 2001). Furthermore, personal quality skills also relate to confidence of employees in order to survive in the industry as required by employers (The Conference Board of Canada 1996; SCANS 2001; Kearns 2001).

### 2.3.7 Information and Communication Technology (ICT) Skills

The seventh employability skills considered as most required by employers are Information and Communication Technology (ICT) Skills (The Conference Board of Canada 1996; SCANS 2001; Kearns 2001; Ab Rahim and Ivan 2007). In terms of information and Technology (ICT) skills, the employees should be able to choose technology that is suitable for work, understanding the system, using technologies while working, fixing tools, observation and improving the implementation processes (Mohamad Sattar, 2009).

## 2.4 Quantity Surveying Profession

Quantity Surveying is considered a well-developed and established profession, and Quantity Surveyors are highly respected professionals in the building industry with the ability to analyse cost components as well as provide contractual advice on practical issues related construction project. Quantity Surveyors are those who manage and control costs within construction projects, which may involve the use of management procedures and technical tools to achieve this goal. The methods employed cover a range of activities such as cost planning, value engineering, feasibility studies, cost benefits analysis, life cycle costing, valuation and cost estimation. A quantity surveyor is sometimes also known as construction economist, cost engineer or construction manager. Quantity Surveyors control costs and prices of work, labour, materials and plant required, and possess an understanding of the implications of design decision at an early stage to ensure that best value is obtained for the money to be expended. Quantity surveyors will also prepare tender document in accordance with a published standard method of measurement as agreed to by the various quantity surveying professional bodies and representatives of the construction industry.

The Royal Institution of Chartered Surveyors (RICS) has set a time-frame that for professional Quantity Surveyors, at least three years training are needed. The Board of Quantity Surveyors Malaysia (BQSM) reported through the latest statistics the percentage of graduate Quantity Surveyors in the country is 49.50% (1363), followed by registered Quantity Surveyors at 38.20% (1051) with Quantity Surveying practices at 12.30% (339). The roles of the Quantity Surveyor can be classified into two. Ashworth & Hogg (2007) mentioned that Quantity Surveyors can be Consultant Quantity Surveyor and Contractor Quantity Surveyor. A Consultant Quantity Surveyor is focused on construction cost and value management (Canadian Institute of Quantity Surveyor's, 2002). Basically, the services of Consultant Quantity Surveyor are concerned with construction contracts and to give advice on what a project would cost (QS Professionals,

2013). Quantity Surveyors will be working on behalf of clients to negotiate the rates with contractors, and valuing the works involved.

Additionally, according to Ashworth and Hogg (2007) Contractor Quantity Surveyors are the persons employed by contractors because of the need to engage and control contractors' financial and commercial interests and assist them in more controversial areas of the contract. Contractor Quantity Surveyors could also be engaged in issues relating to costs and appraisals from the perspectives of the contractors, and negotiating issues related to measurements with the client's quantity surveyor on the project.

## 2.5 Skills of Quantity Surveyor

According to Michael H.W Hoffmann et al (2010), skills mean the ability to employ knowledge and apply knowledge to complete projects and figure out the problem. He also stated that competences mean the demonstrated ability to apply knowledge, skills and personal, social and / or methodological abilities, in a line of work or study situations and in professional and personal growth.

Quantity Surveyors require the basic skills known as skills for employability to enable them to provide the various services of a Quantity Surveyor effectively. Basically, the common competencies or skills of Quantity Surveyor required in the construction industry are technical skills which include measurements and valuation, giving cost advices, estimating cost and cost control, communication, interpersonal, leadership, and problem solving skills (BQSM, 2012).

In addition, there are three categories of competencies required for the quantity surveyor (RICS, 1998) which are basic competencies, core competencies and optional competencies. The basic competencies cover all construction professionals under the Royal Institution of Chartered Surveyors structure; the core competencies are uniquely required of quantity surveyor while the optional competencies are areas of specialisation for future career diversification (Nkado, 2000).

### 3. Research Methodology

#### 3.1 Questionnaire Design

The purpose of this section is to explain the function of each segment of the questionnaire. All questions were closed-ended type and the questionnaire was divided into three main sections:

Section A : Background of Employers

Section B : The importance of employability skills through employers perspective

Section C : The elements of employability skills needs by employers for Quantity Surveying graduates

As for Section A, the questions had been self-developed whereas Section B and Section C has been modified based on SCANS Model (2001), Mohd Yusof Husain, Seri Bunian Mokhtar, Abdul Aziz Ahmad, Ramlee Mustapha (2010).

A 5-point-Likert scale ranging from 1 (not very important) to 5 (very important) was used in this study.

#### 3.2 Data Collection Technique

For this study, the researcher used a quantitative approach to achieve the objectives. The online survey approach is used by sending out email questionnaires to gather information from the respondents.

Online questionnaire is applied for this research because the researcher has greater flexibility in displaying questions. Besides, the period spent on the analysis is subsequently reduced since the data is collected into a central database. It is also easier to correct the errors on an online questionnaire, since the researcher does not have to reprint all the questionnaires to distribute to the respondents.

#### 3.3 Sampling Design

In this study, the researcher used a probability sample to collect data, which was collected by emailing the questionnaires among the employers in Quantity Surveying consultant firms in the Malaysian construction industry. A total number of 241 firms were selected randomly from 339 QS firms. The data was conducted over a two month period to solicit results, from which 33 numbers responded. It involved only random selection for employers because some of the firms have more than one branch. The list of firms were obtained from the details provided by the Board of Quantity Surveyors Malaysia (BQSM).

**Table 1: Gender**

Gender	Frequency	Percentage %	Cumulative Percent
Male	21	63.60	63.60
Female	12	36.40	100.00

**Table 2: Age**

Age	Frequency	Percentage %	Valid Percent	Cumulative Percent
30-40 years	11	33.30	33.30	33.30
41-50 years	8	24.20	24.20	57.60
51-60 years	13	39.40	39.40	97.00
61 -70 years	1	3.00	3.00	100.00

**Table 3: Working Experience**

	Frequency	Percentage %	Valid Percent	Cumulative Percent
5 to 10 years	8	24.20	24.20	24.20
11 to 15 years	4	12.10	12.10	36.40
15 to 20 years	6	18.20	18.20	54.50
More than 20 years	15	45.50	45.50	100.00
Total	33	100.00	100.00	

**Table 4: Number of Projects Involved**

	Frequency	Percentage %	Valid Percent	Cumulative Percent
10 to 20 projects	9	27.30	27.30	27.30
21 to 30 projects	8	24.20	24.20	51.50
More than 30 projects	16	48.50	48.50	100.00
Total	33	100.00	100.00	

## 4. Data Analysis

### 4.1 Background of Employers

Table 1 addresses the gender of the respondents. Most of the respondents were Male (63.60%), with 36.40% Female.

Table 2 shows the age of respondents. The majority of the respondents were 51-60 years of age (39.40%), followed by 30-40 years (33.30%), then 41-50 years old (24.20%) and 61-70 years old (3.00%). This shows that the majority of the respondents on the age is valid as it was plausible to be employers within the age bracket of 51-60 years.

Table 3 shows the years of working experience in their firms. The maximum of the respondents had experience of more than 20 years (45.50%), followed by 5 to 10 years (24.20%), then 15 to 20 years (18.20%). The least working experience is 11 to 15 years (12.10%). This result shows that the employers have the necessary experience the industry.

It can be seen in Table 4 above that a majority of the respondents were involved in more than 30 projects (48.50%), followed by 10 to 20 projects (27.30%). The least number of projects involved by respondents is 21 to 30 projects (24.20%). This further validates the notion that the respondents were professionally experienced.

#### 4.2 The importance of employability skills through employers perspective

Table 5 shows seven employability skills that were continuously analysed. Most respondents rank interpersonal skills as the most important compared to others (total mean rank = 4.58), followed by personal quality skills (total mean rank = 4.50), teamwork skills (total mean rank = 4.45), thinking skills (total mean rank = 4.29), information and communication technology (ICT) skills (total mean rank = 4.24), basic skills (total mean rank = 4.08) then resource skills (total mean rank = 3.58).

According to table 5, interpersonal skills are the most important as it is ranked as the top by employers. This could be due to goal-directed behaviours used in face-to-face interactions (Mohamad Sattar, Rose Amnah, Ahmad Rosli, 2014) and is evidently the most required skills to be considered by employers. On the other hand, resource skills was ranked last by the employers. This is because these skills were slanted more towards management, ostensibly related to self-management and time management, both of which can be improved through training and exposure.

#### 4.3 The elements of employability skills needs by employers for Quantity Surveying graduates

Interpersonal skills (Table 6) of employability was measured using two elements which are communication skills (mean rank = 4.76) and leadership skills (mean rank = 4.39). Communication skills relate to the ability to communicate through a wide variety of communication levels and is important because effective

**Table 5: Rank of employability skills**

Elements	N	Rank
Interpersonal Skills	4.58	1
Personal Quality Skills	4.50	2
Teamwork Skills	4.45	3
Thinking Skills	4.29	4
Information and Communication Technology (ICT) Skills	4.24	5
Basic Skills	4.08	6
Resource Skills	3.58	7

**Table 6: Interpersonal Skills**

Elements	N	Rank	Mean Rank
Communication Skills	33	1	4.76
Leadership Skills	33	2	4.39
<b>Total Mean Rank</b>	-	-	<b>4.58</b>

**Table 7: Personal Quality Skills**

Elements	N	Rank	Mean Rank
Professional Practice	33	1	4.55
Self - development	33	2	4.45
<b>Total Mean Rank</b>	-	-	<b>4.50</b>

communication helps to accomplish interpersonal acceptance, develop teamwork and team motivation. Besides, interpersonal skills impact on working with people, hence the need to possess leadership skills to guide them. This is because these skills relate to continuous accountability and related to the capacity to work autonomously. Therefore, communication and leadership skills are considered the main elements of interpersonal skills.

In terms of personal quality skills (Table 7), most respondents indicated that professional practice is most needed by employers (mean rank = 4.55) together with self-development (mean rank = 4.45). Personal quality skills are personal skills, behaviours and natural processes that drive a person to grow their potential as is related to integrity, honesty and values important for employees. Besides, personal quality skills also relate to levels

of confidence of employees in order to survive and progress in the industry.

Table 8 illustrates element of employability skills needed by employers in term of working as a team which is teamwork skills (mean rank = 4.45). Teamwork skills are the skills needed for productive contribution towards the company; like most organisations, quantity surveying practices espouse teamwork.

In context of thinking skills (Table 9), most respondents showed that the sub-skills needed are documentation skills (mean rank = 4.48), followed by problem solving skills (mean rank = 4.30) and synthesis (mean rank = 4.09). In terms of documentation, most employers prefer their employees to be able to prepare written information in a format which clearly conveys meaning, and this conforms vividly to the requirements of quantity surveying practices, where the bulk of activities relate to document

management. However, synthesis is considered the lowest sub-skill, again affirming the higher preference to documentation, where order and convention are the norm.

In the context of information and communication technology skills (Table 10), the elements most needed by employers are measurement using IT (software) (mean rank = 4.42). This is due to cater current needs and future expectations of the industry as nowadays, most of the firm use software instead of traditional method (take-off). Next, computer literacy (mean rank = 4.30), followed by computer and information technology (mean rank = 4.27). However, data information and information technology (mean rank = 3.97) are not preferable as it is common basic computer skills.

In terms of basic skills (Table 11), responses from consultant quantity surveyors showed that measurement is the most needed (mean rank = 4.79). This constitute a basic and common skill of quantity surveyors and are essentially required in the construction industry (BQSM, 2012). On the other hand, other employability skills that are required from the employers in terms of basic skills are pricing (mean rank = 4.30), procurement and construction technology (mean rank = 4.18), mapping (mean rank = 3.64), construction law and regulation (mean rank = 3.88) and value management (mean rank = 3.58); value management is not practiced abundantly in most of the consultancy organisations, hence its low ranking.

Elements of employability skills needed by employers in terms of resource skills are shown in Table 12. Most respondents showed that management is most needed (mean rank = 3.76). This could be attributable to personal development, as graduates will improve identification and understanding of their own strengths and weaknesses, from being able to set personal goals and to understand the value they bring to the organisation. Other resource skills are project management

**Table 8: Teamwork Skills**

Elements	N	Rank	Mean Rank
Teamwork Skills	33	1	4.45
<b>Total Mean Rank</b>	-	-	<b>4.45</b>

**Table 9: Thinking skills**

Elements	N	Rank	Mean Rank
Problem Solving Skills	33	2	4.30
Documentation	33	1	4.48
Synthesis	33	3	4.09
<b>Total Mean Rank</b>	-	-	<b>4.29</b>

**Table 10: Information and Communication (ICT) Skills**

Elements	N	Rank	Mean Rank
Measurement using IT (software)	33	1	4.42
Computer and Information Technology	33	3	4.27
Data information and Information Technology	33	4	3.97
Computer Literacy	33	2	4.30
<b>Total Mean Rank</b>	-	-	<b>4.24</b>

**Table 11: Basic skills**

Elements	N	Rank	Mean Rank
Measurement	33	1	4.79
Mapping	33	4	3.64
Construction Technology	33	3	4.18
Construction Law and Regulation	33	5	3.88
Value Management	33	6	3.58
Procurement	33	3	4.18
Pricing	33	2	4.30
<b>Total Mean Rank</b>	-	-	<b>4.08</b>

**Table 12: Resource skills**

Elements	N	Rank	Mean Rank
Management	33	1	3.76
Project Management	33	2	3.70
Facility Management	33	4	3.33
Business and Management Skills	33	3	3.52
<b>Total Mean Rank</b>	-	-	<b>3.58</b>

(mean rank = 3.70), followed by business and management skills (mean rank = 3.52) and facility management (mean rank = 3.33). Facility management is ranked lowest primarily because professional quantity surveyors do not offer this as mainstream service..

## 5. Conclusion

This study has revealed that quantity surveying employers rated the importance of employability skills highly, especially for the profession's new graduates. The findings of this study clearly indicate that quantity surveying graduates would need to be well-prepared in order to fulfill the employer's requirements which are related to: interpersonal skills, personal quality skills, teamwork skills, information and communication technology (ICT) skills, basic skills and resource skills. With tangible shifts in the global market place of graduates worldwide, employers are increasingly looking for pertinent employability skills to accompany technical skills of graduates entering the construction industry. Having the awareness as well as the right set of employability skills required by prospective employers can only enhance the graduates' competitiveness and increase employment opportunities in the current challenging scenario. ▽

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All submitted articles are subject to peer review by members of the Editorial Board and other invited scholars and professionals. Electronic submissions are strongly encouraged. Articles should be original, unpublished works that can help owners, investors, developers, surveying professionals, policy decision makers and government.

Each published article in The Malaysian Surveyor will be paid an **honorarium of RM300** and will be considered for the **2015 Best Article Awards** for each of the RISM Divisions.

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**N**AREIT has recently launched FTSE NAREIT PureProperty® Index Series<sup>1</sup> which reports daily returns on diversified portfolios of unlevered properties as well as equity holdings in the real estate asset class, providing insights and opportunities for investors.

The PureProperty Series aims to track the underlying real estate assets owned by constituent REITs. This involves stripping out the impact of gearing on REIT indices, while avoiding the lag inherent in appraisal-based performance indicators. The result is an investable total return series computed on a daily basis.

The values are calculated from daily stock market valuations of, and dividends paid by, stock exchange-listed U.S. equity REITs, using a patented methodology to infer property returns based on detailed information about the holdings and balance sheets of property-owning REITs. U.S. REITs own and manage high-quality properties in and around major metropolitan areas throughout the country.

The FTSE NAREIT PureProperty® indices measure returns of diversified portfolios of unlevered properties in the Apartment, Health Care, Hotel, Industrial, Office and Retail sectors; for the East, Midwest, South and West regions of the United States; and for 11 region/property type combinations. In addition to the property indices representing the returns to unlevered property investments, the FTSE NAREIT PureProperty® Index Series also includes equity indices measuring the investment returns to properties through the balance sheets of the REITs holding them.

While indices of property-level returns based on private real estate holdings are computed monthly or quarterly and are published with four to eight-week delays, the FTSE NAREIT PureProperty® indices are published on the same day as the returns they measure. Same-day computation provides multiple benefits for investors.

The new FTSE NAREIT PureProperty® Index can be applied for the following portfolio management purposes:

## **(a) Completely Investable**

Investment products that provide returns replicating the indices, without significant tracking error, can be developed

simply by buying positions in the constituents of a given FTSE NAREIT PureProperty index in proportion to their index weights.

## **(b) Unlevered Exposure**

Financial instruments can be developed to provide investors with unlevered exposure to one or more segments of the nearly \$1.5 trillion of REIT-owned properties by taking positions corresponding to the constituents of a property-level FTSE NAREIT PureProperty index, including positions corresponding to fixed-income indices that reflect the cost of debt employed by REITs and that therefore help to correct for the use of leverage by REITs.

## **(c) Tactical Asset Allocation**

The index series supports the creation of investment products that will allow investors to take or adjust positions quickly and efficiently by buying and selling positions corresponding to the constituents and weights of the appropriate FTSE NAREIT PureProperty indices, all of which are traded in liquid listed markets.

## **(d) Hedging and Risk Management**

Direct real estate investors will be able to more effectively manage real estate portfolio risks with the immediacy securities investors enjoy. For example, investment products indexed to the FTSE NAREIT PureProperty indices will enable investors with large positions in a particular segment of the real estate market to hedge their over-exposure and reduce their real estate portfolio's concentration risk.

## **(e) Pulse of the Market**

The indices provide valuable insights on a daily basis for developers, brokers, lenders and others who need to monitor the pulse of the real estate market on a timely basis to see how property values have been changing.

## **(f) Leverage Targeting**

Combining holdings corresponding to property-level and equity-level FTSE NAREIT PureProperty® indices may enable investors to effectively tailor the amount of leverage in their real estate exposures. ▼

<sup>1</sup> Source: <https://www.reit.com/data-research/reit-indexes/ftse-nareit-pureproperty-index>

# Glodon Integrated Solution for Construction Project



In the life cycle of construction, the core activities for QS are quantity take-off and cost estimate. To meet these needs, Glodon provides professional products and services.

Our quantity takeoff products, Glodon TAS2014 and Glodon TRB2014, enable you to build 3D models using the most-advanced BIM 3D technologies, and calculate quantities rapidly and automatically based on the standard measurement rules. With

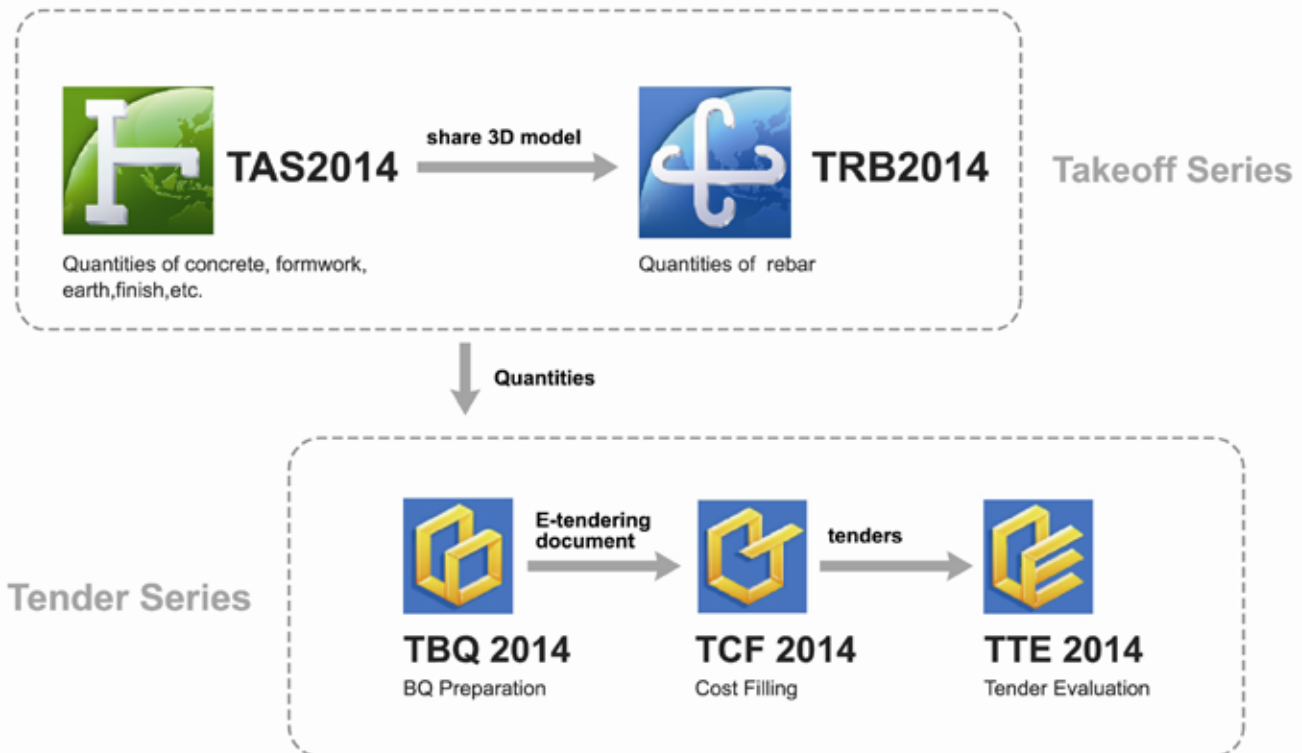
the built-in SMM2, TAS2014 helps to calculate the quantities for concrete, formwork, finish, earth, etc. while TRB2014 is widely used to calculate the quantities for rebar, including both the total weight and the detailed quantities on the basis of the built-in Commonwealth measurement method. Besides, the two products are developed on a uniform platform, allowing for model sharing.

**Once the quantities are measured, Glodon Tender Series (including TBQ2014, TCF2014, and TTE2014)**

**will deal with the whole tender process from preparing and generating e-tenders, pricing tenders to evaluating tenders and selecting the tender winner.**

Above is the Glodon Integrated Solution for construction project, which is accurate, efficient and computerized.

## Glodon Integrated Solution



### 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.

#### Efficient

- Finish measurement work by modeling instead of by excel or by hand.
- Supports various drawing formats (\*.DWG, \*.PDF, \*.IFC, \*.GFC, JPG, etc.).
- Model-sharing between TAS and TRB for collaboration work.

#### Precise

- Built-in localized calculation rules as in different markets. (e.g. CP97, SMM2, SMM4, SMM7, ACI, etc.).
- 3D model for precise deduction calculation.
- Customized calculation settings.

#### Easy

- Flexible reporting system. Supports import and export of Excel files.
- Quickly handle variation orders.

#### BIM

- Compatible with Autodesk Revit format \*.RVT;
- Compatible with popular 2x3 \*.IFC format;
- Import and export \*.IFC format.

### TRB

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

#### Efficient

- Build 3D model rapidly based on drawings imported.
- Supports various drawing formats (\*.DWG, \*.PDF, JPG, etc.). Model-sharing between TAS and TRB for collaboration work.
- Elements are linked automatically for deduction and anchorage calculation integrally.
- Convenient in variation with synchronization between models and quantities.

#### Precise

- Built-in localized calculation rules as in different markets, e.g. BS, ACI, etc.
- Customized calculation settings.
- 3D model for precise deduction calculation.
- Precise calculation with special structure by built-in algorithm.

#### Easy

- Flexible reporting system. Supports import and export of Excel files.
- Convenient in auditing results.

### 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.

#### Flexible

- Create tender quickly by using Excel and standard project.
- Connect with TAS to load quantities directly.
- Identify paper BQ.

#### Professional

- Auto-process variation and output addendum.
- Support customizing and auto layout of report.
- Provide multiple methods of pricing.

#### Safe

- Administrative Tool: Assign permission to operate project.
- E-tender: Control tender editing permission of different users.



# Stop your Cognitive Distortions to Reduce Stress

Cognitive distortions, or in simple terms, faulty thinking patterns, can impact our thoughts, responses, behaviours and the way we handle our daily stress. The way we think about what is going on in our daily lives can greatly contribute to whether or not we find events in our lives stressful or otherwise. Therapists claim that self-talk develops from childhood and the way we were brought up, but the continuous practice to change the habitual thought pattern may bring a big change in life.

The internal dialogue which is our self talk that runs in our minds can lead the way as to how we interpret those daily events which in turn portray the thinking patterns and our response to it. That leads to an explanation as to how we judge the situations that we encounter in front of our lives as these can actually make things seem better or worse, stressful or less stress, threatening or otherwise. Some of us tend to see things in a more positive light, while others tend to view things more negatively.

## How to change for the better?

The process of recognising, challenging, hanging cognitive distortions and negative thought patterns can be accomplished through cognitive restructuring. In many cases, this restructuring can be achieved through practice and the commitment to change. A little cognitive restructuring can bring significant change.

## Stop cognitive distortions to reduce stress

Thinking patterns can be habitual but there is room for change. Without positive change of the thinking pattern, life can be damaging. As the stress response is triggered by perceived threat, an attitude that maximises the negative thoughts and habits can lead to threatening scenarios and, therefore, stressed. It is the knowledge of change as to how things are viewed that can lead to positive handling of stress.

For meaningful life to go on, learn the tricks to handle the mind that distort the views. Learn to see daily events positively, and learn the experiences of those events to avoid depression and other mind disorders. It is the positive mood that makes it easy to spot the cognitive distortions and the lasting positive changes of handling stressors in life.

## Avoid "all-or-nothing" thinking

Never think in extremes but look for rooms for negotiating with your own self. Learn to accept the facts of life and avoid being a perfectionist. Adopting the "all-or-nothing" characteristics can only magnify the stressors in life, and small problems can be even bigger and damaging. You

Learn to accept the facts of life and avoid being a perfectionist. Adopting the "all-or-nothing" characteristics can only magnify the stressors in life, and small problems can be even bigger and damaging.

may be stuck in a traffic jam, but do accept the fact that you are not alone. You may be facing a big budget this month but there are many others who are even worse than you. The food served by the wife is tasteless today but there are many others who only live on a single meal a day. Avoid using the words "always" and "never" when describing things but learn to accept things that come across and learn to achieve things that you aim.

## Get rid of "overgeneralisation"

Isolated events may happen despite the fact that we are taking all kinds of measures to avoid them happening. Never treat isolated events as future events. They could be "one-off" things that happen beyond our control. You may face a rude salesgirl at the supermarket but stop believing that all salesgirls are the same. You may come across a queue-jumper at the traffic light but he may be rushing to the hospital. The act of habitually labeling others leads to

jumping to negative conclusions as the one-dimensional view paves the way for overgeneralisation which normally ends up in relationship conflicts.

## Mental filtering

Learn mental filtering to differentiate daily events as many are positive ones despite occasional unwanted things may happen from time to time. Learn to appreciate the positive outcomes of life but never magnify the one thing that goes wrong. Disqualifying the positive tends to treat positive events like flukes. It is the evil of cognitive distortion that places a stronger emphasis on negative events and downplaying the positive ones. Stop imagining the worst possible scenario of a simple hiccup and it may be even worse when a simple mistake is magnified as a catastrophe.

To filter the mental may also mean to see the positive side of everything rather than placing an inordinate level of focus on the negative and discounting the positive. To reduce the stress level is to focus on the positive aspects of a situation and make peace with the negatives. If things just seem to be going wrong one after another, make an effort to notice and appreciate what does go smoothly.

## Jumping to negative conclusions

Learn to develop logical positive conclusions. The thought that your boss hates you but acted positively when he needs your effort to solve his problems is an example of jumping to conclusions. Conclusion-jumpers can often fall prey to mind reading when they start to ignore the good values of others. It can be even worse if one predicts negatively by ignoring the true intention of others. Jumping to conclusion is a serious stressor when one starts to ignore certain facts when drawing conclusions. To disregard a situation as evidence when something unexpectedly happen means a failure to look objectively at events beyond

our reach, and this may contribute to more problem solving episodes.

## Practice “awareness and flexibility”

Those who personalise their stressors tend to blame themselves or others for things over which they have no control, creating unnecessary stress. Avoid blaming themselves for the actions of others, and don't blame others for their own feelings and mistakes. Try to recognise the cognitive distortion by loosening the grips of these distortions and being aware of them. Once you become aware of your patterns of self-faulty thinking, you can begin to challenge these thoughts more and more by looking for sensible evidences and find alternate conclusions. With time and practice, challenging your negative thinking patterns will

become second nature to flexibility by replacing them with more positive thoughts and views. ▽

## A little cognitive restructuring can bring significant change.

*W.M.A. Wan Hussin is a Professor at the School of Civil Engineering, Universiti Sains Malaysia. He conducts several courses on stress management and delivers public lectures and brain storming sessions on management issues for various organizations. He is currently a Licensed Land Surveyor, Member of the Association of Authorized Land Surveyors (MAALS) Malaysia, Fellow of the Royal Institution of Surveyors Malaysia (FRISM), a Malaysian Speaking Professional (MSP) of the Malaysian Association of Professional Speakers, and can be reached at [wmabwh@gmail.com](mailto:wmabwh@gmail.com)*

Conclusion-jumpers can often fall prey to mind reading when they start to ignore the good values of others. It can be even worse if one predicts negatively by ignoring the true intention of others.

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# 17th International Surveyors Congress

Held on 11th-12th June 2015 at One World Hotel, Petaling Jaya, Selangor, the 17th International Surveyors Congress was a very successful 2015 event organised by the Royal Institution of Surveyors Malaysia (RISM). The official opening was done by the Minister of Works, YB Dato' Sri Haji Fadillah.

The Congress theme is 'Integrating for Excellence' and this within people, business and organisations. It is about embedding excellence whilst embracing the concept of integrated working thus reaping the benefits by a holistic view not only in terms of leaderships, strategy and organisation effectiveness but also in aspects of culture and values.

Over 460 delegates attended and participated in the two-day Conference, which brought together surveyors from around the nation. We had about 20 speakers in total including the divisional sessions who presented their papers. At the foyer of the main ballroom, we accommodated 27 booths that displayed the latest in surveying technology from related companies and higher learning institutions as well.





The Organising Chairman and the Committee Members would like to express their gratitude to all participants, session chairs, Keynote speakers and sponsors for their kind contributions towards the success of this Congress.

It is hoped that all participants benefited in one way or another in their endeavours in the future as well as moulding of the innovative and inspire our professionals for the future.



# 54th RISM Annual General Meeting

The 54th RISM Annual General Meeting (AGM) was held on 13th June 2015, at One World Hotel, Petaling Jaya, Selangor.

The AGM proceeded smoothly with the presentation and deliberation of the Annual Report and the Annual Financial Statement. Following the AGM, there was a presentation of the Diploma of New Membership





Certificate for the categories of Fellow and Member. This was followed by the presentation of RISM Professional Examination Certificates and 10 Best Student Awards from RISM in partnership with Universities.

The AGM concluded with the President presenting the Certificates of Appreciation to all Councillors, and the introduction of incoming Councillors for session 2015/2016 of which YBhg. Dato' Sr K. Sri Kandan became the new President of RISM, taking over from YBhg Dato' Sr Hasan Jamil.



## 54th RISM Annual Dinner

In the evening of 13th June 2015, the 54th RISM Annual Dinner was held at the Imperial Ballroom, One World Hotel, Petaling Jaya, Selangor.

This year's dinner was graced by HRH the Sultan of Selangor, Patron of RISM. The night witnessed the presentation of the following Excellence Awards to worthy recipients:

**Outstanding Writer on Property and Construction:**

Mr. Chang Kim Loong

**Lifetime Achievement Award**

Sr Lim Meng Heok

**Contribution towards Sustainability:**

YBhg. Datuk Sr Chua Soon Ping

**Malaysian Surveyor of the Year:**

YBhg. Dato' Muhammad Nawawi Bin Mohd Arshad



His Royal Highness later presented the Chain of Office to YBhg. Dato' Sr K. Sri Kandan as the new President of RISM for the session 2015/2016. The dinner ended with the cutting of the Anniversary Cake and presentation of memento to HRH, the Sultan of Selangor.







# Young Achievers' Award (YAA) National Competition 2015

YAA National Final was successfully hosted at Hotel Seri Malaysia Bagan Lalang, Sepang from 17th – 19th April 2015.

Due to the overwhelming support from the sponsors for the session, YAA was hosted for three days and two nights. This allowed the students to bond better and the organising committee was able to carry out more activities.



The students arrived on, 17th April 2015. They then made a technical visit to Kuala Lumpur International Airport 2, Sepang. A Welcome Dinner and briefing was organised to welcome the participants, and as a session of interaction and networking among the Students, Teachers and Surveyors.

This time, fourteen (14) schools participated and they were:

**(a) East Coast Branch**

- Sekolah Menengah Kebangsaan Dato' Ahmad Maher
- Sekolah Menengah Kebangsaan Kamil
- Maktab Sultan Ismail

**(b) Northern Branch**

- Sekolah Menengah Jenis Kebangsaan Chung Ling
- Sekolah Menengah Kebangsaan Bukit Jambul
- Sekolah Menengah Kebangsaan Penang Free

**(c) Johore Branch**

- Sekolah Menengah Kebangsaan Sultan Ismail
- Sekolah Menengah Kebangsaan (P) Sultan Ibrahim
- Maktab Sultan Abu Bakar

**(d) Central Branch**

- Sekolah Menengah Kebangsaan Convent Bukit Nanas, KL
- Sekolah Menengah Kebangsaan Meru, Klang
- Sekolah Menengah Kebangsaan Damansara Jaya, Petaling Jaya
- Sekolah Menengah Kebangsaan Tengku Ampuan Rahimah, Klang
- Sekolah Menengah Kebangsaan Subang Utama



The result for the YAA competition was announced during the Gala Dinner on 18 April 2015, and the President of RISM, Sr Hasan bin Jamil gave away the prizes. Result as follows:



Champion

SMJK Chung Ling, Pulau Pinang receiving RM3,000.00 in cash, winning plaques and trophy and YAA Challenge Trophy.



1st runner up

SMK Sultan Ismail, Johor Bahru receiving RM2,000.00 in cash, winning plaques and trophy.



2nd runner up

SMK Subang Utama, Subang Jaya receiving RM1,000.00 in cash, winning plaques and trophy.

The Chair and the Organising Committee wish to express their gratitude to Division of Co-Curricular and Arts, Ministry of Education Malaysia and judges; Assoc. Prof. Sr Syahrul Nizam Kamaruzzaman (Building Surveying), Sr Masreta Mohd@ Basri (Geomatic & Land Surveying), Sr Amnah Mohammed Salleh (Quantity Surveying) and Sr Victor Huang Hua (Property Management, Valuation and Estate Agency Surveying), and thanks also to the sponsors for their continuous support:

- |   |   |
|---|---|
| 1. Land Surveyors Board Malaysia                          | 7. Perunding PCT Sdn Bhd                    |
| 2. Board of Valuers, Appraisers & Estate Agents, Malaysia | 8. Jurukur Bahan Antara                     |
| 3. Board of Quantity Surveyors, Malaysia                  | 9. HMF Consult Sdn Bhd                      |
| 4. Construction Industry Development Board Malaysia       | 10. Metropolis Property Consultants Sdn Bhd |
| 5. Association of Authorised Land Surveyors Malaysia      | 11. Geometra Surveys Sdn Bhd                |
| 6. C.H. Williams Talhar & Wong Sdn Bhd                    |   |

# LIST OF NEW MEMBERS

March 2015–April 2015

## QUANTITY SURVEYING

### Member

Sr Abdul Aziz Harun  
*Jaya Zira S/B*

Sr Chea Moi Eng  
*Nil*

Sr Faridah Manchullah  
*AAR Jurukur Bahan*

Sr Hafadzafarol Morshidi  
*PUBM Quantity Surveyors Malaysia*

Sr Haminol Mohamed Hussein  
*Tech. Park Malaysia Corp.*

Sr Lau Siew Hui  
*Permas Jaya Sdn Bhd*

Sr Mohd Idzuan Abdul Hamid  
*Universiti Malaysia Kelantan*

Sr Mohd Rahman Mohd Nor  
*JKR*

Sr Mohd Suhaimi Md Noor  
*UEM Construction Sdn Bhd*

Sr Mohammad Harith Mohd Yunos  
*Caw. Dasar & Pengurusan, JKR*

Sr Nor Hafizi Md Lani  
*Uni-Technologies S/B*

Sr Norhisham Abdul Ghani  
*Iskandar Investment Berhad*

Sr Patrick Lim Poay Chuan  
*Brunsfeld Group Bhd*

Sr Sariah Abdul Karib  
*CIDB*

Sr Suzila Yusof  
*Prasarana Intergrated Mgmt & Engineering Service*

Sr Tee Siew Wing  
*Langdon & Seah*

Sr Wan Azlina Ibrahim  
*BKUB, JKR*

### Graduate

Arbainah Ahmad  
*Basar & Harun Sdn Bhd*

Azman Mohd Ihsan  
*Pengurusan Aset Air Berhad*

Chiam Tak How  
*CSL QS Consult*

Eng Biing Lun  
*Baharuddin Ali & Low*

Faizul Azwan Ariffin  
*CKUB, JKR*

Fong Sook Teng  
*Jurukur Bahan FPS Sdn Bhd*

Izhamuddin Ibrahim  
*Perunding NFL Sdn Bhd*

Izzwan Datuk Isahak  
*Pakatan International Md Isahak & Rakan-Rakan*

Lai Yan Jun  
*PEB Consultancy*

Lina Hadzariah Sogito  
*Kinabalu Setia Konsult Sdn Bhd*

Ling Wen Hoong  
*DK Consultants*

Lim Tiek Poh  
*Unitech QS Consultancy Sdn Bhd*

Liu Sam Hui  
*TC Mgmt Services Corp. S/B*

Loh Wai Jeng  
*Langdon & Seah*

Mahendran A/L Ponnusamy  
*Wawasan QI Properties*

Mohd Fikri Jamalullail  
*JUBM Sdn Bhd*

Mohd Nazaruddin Aifat Nazeli  
*JUBM Sdn Bhd*

Muhammad Saiful Razali  
*Amer & Associates*

Ngu Sze Su  
*LSH Jurukur Bahan*

Nurlee Azizah Ahmad  
*Perunding NFL Sdn Bhd*

Nur Syazni Isa  
*Basar & Harun Sdn Bhd*

Norhafiza Hamdan  
*Basar & Harun Sdn Bhd*

Tan Chee Lim  
*DL QS Consult*

Tan Yean Hong  
*Perunding NFL Sdn Bhd*

Syazwin Suhatta  
*Perunding DMA Sdn Bhd*

Syed Osman Siddiq Syed Ghaibi  
*JUBM Sdn Bhd*

Wahida Wahi  
*Uni. College of Sarawak*

Wong sen Choy  
*Toffco Sdn Bhd*

Chang Mei Ling  
*Jurukur Bahan FPS S/B*

Lim Chai Ni  
*Jurukur Bahan FPS S/B*

Song Wai How  
*Malaysian Land Properties S/B*

**Probationer**  
Fong Lay Cheng  
*Mentari Berseri Sdn Bhd*

Mohd Sani Hussein  
*Basco Sdn Bhd*

### Student

Aaron Tan Wee Lian  
Ain Fatimah Abd Ghani

Chai Chern  
Chong kee Jui  
Chong Zhenyi

Corrinne Lee Yue Chuin  
Daren Lim Chung Hsien  
Eric lim Chin Kiat

Fakhri Iqbal Ahmad  
Fatin Izzati Abdul Kadir  
Fung Pui Kei

Gary Wong Kie Peng  
Jason Thian Chin Kong  
Kho Kai Sheng

Kelvin Tsai Vei Yung  
Kong Sheau Lin  
Lai Cheow Fun

Lai Sau Mun  
Lai Soon Hau  
Lee Jia Syuen

Lee Loo Seng  
Ling How Zhe  
Luthisam Mariyam

Michelle Hii Chai Shien  
Mohd Razif Abdul Raship  
Muhammad Zarul Shahmie Md Zawil

Ng Teck Seong  
Ng Zhiong Kam  
Nur Azela Abdullah

Nurul Fazreena Zol

Ong Kah Mei  
Ooi Khong Cap  
Roderick Ngiam Kee Yung

Seta Anak Wilson Kana  
Sim Bao Jin

Tam Hock Hua  
Tan Pei Jing  
Tan Zhong Xin

Tay Yih Chang  
Teo Yuan Zheng  
Tiong Shih Hui

Wong Zhuye  
Yee Tzong Heng  
Yeo Hui Chia

Yong Joon Yung  
Syaniza Nadhira Alias

## PROPERTY MANAGEMENT, VALUATION AND ESTATE AGENCY SURVEYING

### Member

Sr Ahmad Fairos Mohamad Zamani  
*JPPH*

Sr Ahmad Suhaimi Embong  
*JPPH*

Sr Halimatul Saeidah Abdul Ghani  
*JPPH*

Sr Kong Mei Yuen  
*Knight Frank (M) S/B*

Sr Kho Thong How  
*CMS Property Development S/B*

Sr Louis Yeo Soon Fong  
*Knight Frank (M) S/B*

Sr Mohd Khusyairy Md Zaki  
*Petronas Dagang*

Sr Mohammad Sharom Nizam Shamsuddin  
*JPPH*

Sr Musa Mohamed  
*JPPH*

Sr Nurainun Mardhiyah Abd Rahim  
*UEM Land Berhad*

Sr Nurzalina Luso  
*JPPH*

Sr Siti Nor Zuherryana Dimiyati  
*JPPH*

Sr Siti Noraishah Saharif  
*JPPH*

Sr Tang Meng Leong  
*GE Tan Valuers*

Sr Zannuar Md Dum  
*UEM Land Berhad*

Sr Zulhisyan Abdul  
*JPPH*

**Graduate**  
Hanim Nordin  
*Conso Carta Sdn Bhd*

**Probationer**  
Hanim Nordin  
*Conso Carta Sdn Bhd*

Chang Eng Hoe  
*Shell Malaysia*

Chan Yin Chen  
*Rina Properties*

Chin Lit Xin  
*First Realtors Agency*

Geh Cha Zhen  
*Tropicana Corp.*

Geh Ciu Pei  
*Suez Domain*

Ling Hee Jing  
-

Leow Xin Hui  
-

Leow Xin Rong  
-

Logeswaran A/L Arumugam  
*City Real Properties*

Pauline Perera  
*CIMB Bank*  
Simon Chiau Chee How  
-

Tan Chew How  
*CBD Properties*

Tan Geik Ling  
-

Tang Siok Choo  
*Big Orange Media S/B*

Tiew Chee Ming  
*Sersol Bhd*

Vincent Perera  
*Platinum Properties World S/B*

**Associate Members**  
Sr Eddy Nor Ezwan Haji  
Mohamad  
*Jab. Tanah, Brunei*

### GEOMATIC AND LAND SURVEYING

**Fellow**  
Sr Dr. Mohd Yunus Mohd Yusoff  
*JUPEM HQ*

**Member**  
Sr Azlina Abdullah  
-

Sr Azrina Reli  
*JUPEM Sarawak*

Sr Daimin Binti  
*JUPEM Sarawak*

Sr Eddy Junaidy Ahmad  
*Eddy Junaidy Geo Services*

Sr Mohd Juraidi Ahmad  
*Jurukur Mokhtar Kassim*

Sr Nor Azimah Abu Yan  
*Jurukur Perunding Services Sdn Bhd*

Sr Norlina Ghazali  
*UTM*

Sr Nurul Hazrina Idris  
*UTM Skudai*

Sr Wan Zulaini Abdul Razak  
*JUPEM Pahang*

Sr Wong King Chuan  
*JUPEM Sarawak*

**Graduate**  
Faizal Khailani  
*Colas Rail Asia Sdn Bhd*

Mohd Norazli Kamarudin  
*Jurukur Aras*

Noor Azira Mohd Azman  
*Jurukur Perunding Services Sdn Bhd*

**Student**  
Nabila Ismail  
Nor Adira Sailan  
Nur Safidah Hasan  
Nurul Hidayah Rahaman

### BUILDING SURVEYING

**Member**  
Sr Norazura Mizal Azzmi  
*UiTM, Perak*

**Graduate**  
Muhammad Syahidi Sudin  
*OCBC Bank Berhad*

Anis Azleen Mah Hasan  
*Postgraduate Student*

**Probationer**  
Mohd Jamruz Mohd Jamil  
*LAL Engineering S/B*

Muhammad Zaihafiz Zainal  
Abidin  
*Bakat Pintar L Imperia Institute of Technology*

Muhammad Rabbani Mohamed  
Nordin  
*Sunway Construction Sdn Bhd*

Rizal Shuib  
*Naza TTDI Sdn Bhd*

**Student**  
Ammar Jamil  
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Atiqah Azizah Amrin  
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Ng Lee Chuan  
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Ong Hui Yin  
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# CASIO®



## CIVIL ENGINEERING SURVEYING CALCULATOR



Shock-resistance\*<sup>1</sup>, water-resistance, and dust-resistance\*<sup>2</sup> suitable for hard use in the field  
A civil engineering surveying calculator preloaded with practical programs

\*1 Complies with the MIL-STD-810G standard for impact strength  
In testing involving a total of 26 drops on each face, edge and corner from 122 cm (4 feet) and 90 cm  
\*2 Conforms to the IP Code, an international standard for water-resistance and dust resistance  
IP Code: IPX4 (Second characteristic numeral indicates water-resistance)  
IP Code: IP5X (First characteristic numeral indicates dust resistance)

### 21 preloaded programs useful at surveying sites

1. AXISTRAN 2. R-TRIG 3. PYTHAGOR 4. COORD 5. ANGLE 6. TRAVERSE 7. INVERSE 8. DECENTER  
9. MID-ORD 10. S-CURVE 11. CL-CURVE 12. V-CURVE 13. FORWARD 14. BACKWARD 15. INTSECT  
16. INTSECT 17. V-LINE 18. TRIANGLE 19. QUADRANG 20. HERON 21. STADIA



## fx-FD10 Pro



### TOUGHNESS DESIGN

Durability for outdoor use  
The corner shape prevents damage due to dropping.



### BACKLIT LCD & KEYS

For excellent visibility in any environment



### RUBBER GRIPS

Silicone elastomer is used to prevent slipping during use with wet hands in the rain.



### SIDE KEYS

It's easy to search for the desired program with one hand.



### BATTERY LOCK

Protects the battery from impact or rainwater when dropped

• Dot Matrix display: 128 x 64 dots (LCD with Backlit) • Number of keys: 36 + 3 side keys • Large illuminated keys • USB port (mass storage device) • SD card slot • User memory program area: 62,000 bytes • Storage memory: 1M bytes  
• Dimensions H x W x D (mm): 21.0 x 88.5 x 177.5 • Approximate weight (g): 250 (including batteries) • Power supply: Four AAA size alkaline batteries or four nickel metal hydride batteries  
• Approximate battery life (hours): 200 (AAA size alkaline batteries) / 120 (nickel metal hydride batteries), assuming 5 minutes calculation and 55 minutes display per hour and backlighting set to switch off after 30 seconds

Visit our website for more information about the fx-FD10Pro: <http://world.casio.com/calc/>

\*Designs and specifications are subject to change without notice.

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