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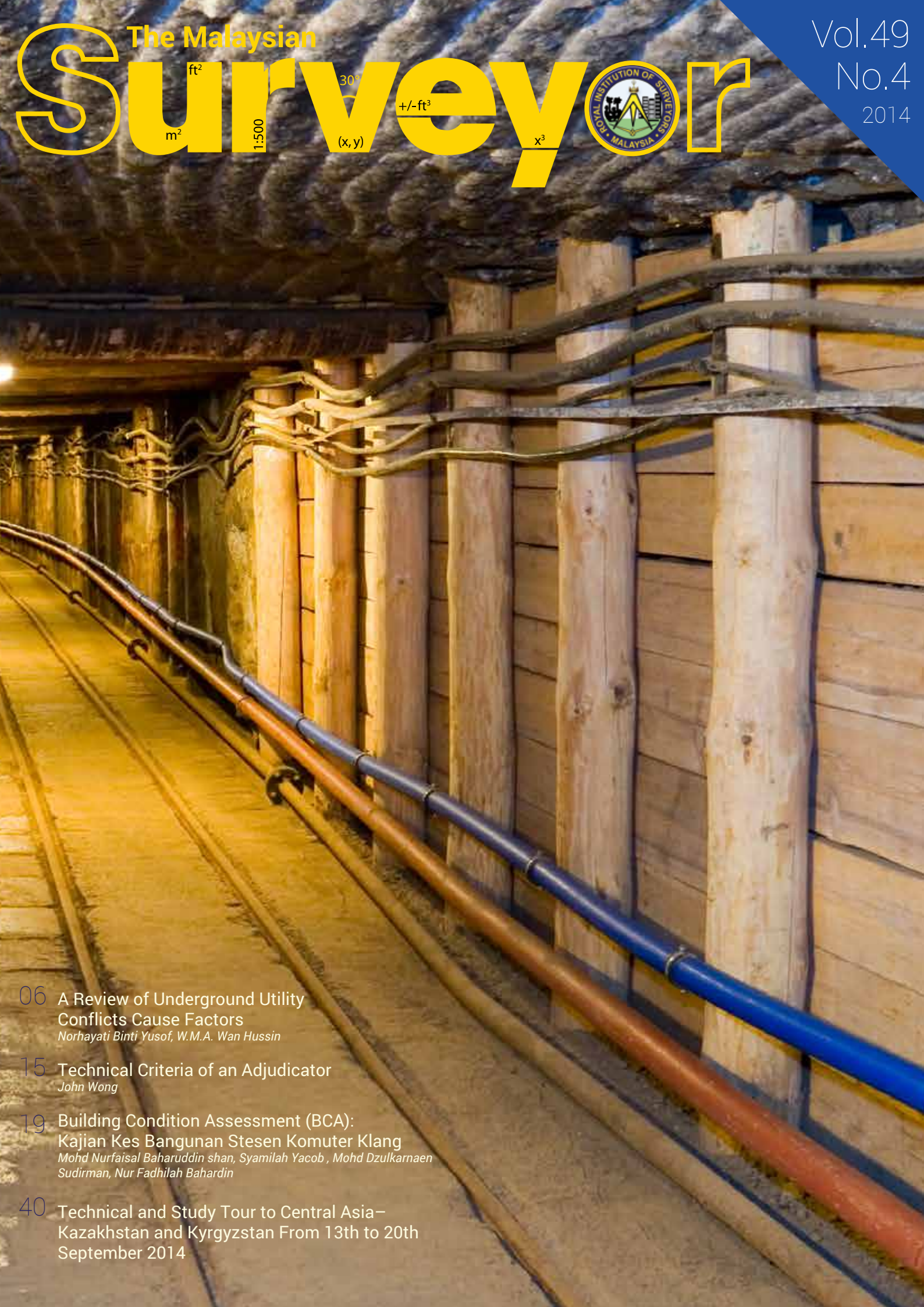

06 A Review of Underground Utility Conflicts Cause Factors
*Norhayati Binti Yusof, W.M.A. Wan Hussin*

15 Technical Criteria of an Adjudicator
*John Wong*

19 Building Condition Assessment (BCA): Kajian Kes Bangunan Stesen Komuter Klang
*Mohd Nurfaisal Baharuddin shan, Syamilah Yacob , Mohd Dzulkarnaen Sudirman, Nur Fadhilah Bahardin*

40 Technical and Study Tour to Central Asia– Kazakhstan and Kyrgyzstan From 13th to 20th September 2014

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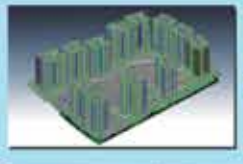


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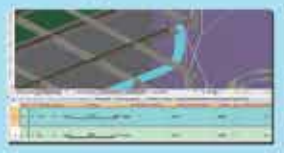
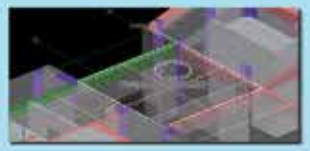

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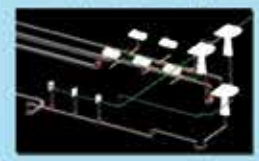


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# CONTENTS

## Peer Review Articles

Pg6 A Review of Underground Utility Conflicts Cause Factors
Norhayati Binti Yusof, W.M.A. Wan Hussin

Pg11 An overview of the Red Book Standard on Preliminary Valuation Advice and Client Discussions
Kamalahasan Achu

Pg15 Technical Criteria of an Adjudicator
John Wong

Pg19 Building Condition Assessment (BCA): Kajian Kes Bangunan Stesen Komuter Klang
Mohd Nurfaisal Baharuddin shan, Syamilah Yacob , Mohd Dzulkarnaen Sudirman, Nur Fadhilah Bahardin

## Interview

Pg30 Interview With Sr Hasan Jamil, President Session 2014/2015






## Managing Stress

Pg33 How to enjoy a stress-less holiday?
Wan Hussin W.M.A.

## RISM Activities

Pg38 Surveyors' Social Responsibility (SSR) Programme in the Cancer Paediatric Ward, Hospital Universiti Kebangsaan Malaysia (HUKM)

Pg40 Technical and Study Tour to Central Asia– Kazakhstan and Kyrgyzstan From 13th to 20th September 2014

## LIST OF NEW MEMBERS

Pg44




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on the occasion of
76th of TYT Birthday
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# A Review of Underground Utility Conflicts Cause Factors

Rapid growth in digging activities and excavation for underground utilities increase utility conflicts around the world, giving a negative impact to the environment, construction companies, workers and traffics. To reduce these negative impacts, a comprehensive understanding of the causes and effects of utility conflicts are needed. This paper identifies various causative factors of underground utility conflict, identified from past research papers and reports. The causes of utility conflicts are presented using mapping matrix and found that 18 implications existed in underground utilities activities. The causes were grouped into 5 categories: Lack of reliable information; Lack of coordination, cooperation and communication; Lack of standardized requirements

for work; Lack of safety awareness and low professionalism, and standards within the utility survey industries; and Lack of skills and knowledge. The frequency of the causative factors in each category was determined based on past research works. Through the identification of these big causes, contractors, service providers and surveyors can avoid and alert the main causes of utility conflicts. It will gives a great benefit for the country in terms of economic, social and protection of the underground utilities itself.

**Keywords:** Underground Utilities, Implication, Utility Conflicts, Causative Factors, Mapping Matrix

## 1.0 Introduction

The rapid growth in the modern world has increased the demand for necessities such as water, electricity, gas and internet. In general, most of these utility services are delivered through underground pipes and cables. All homes and business premises need this utility. The higher the demand for utility services means more pipes and cables are buried beneath our feet. All utilities are not planted at the same depths, and not all travel in the same direction. As there is a limited space available below ground and the amount of cables and pipelines were installed in such a small area by different companies, this makes the underground more crowded. This situation could result in a conflict utility, especially when new utilities will be buried at the same place.

To avoid these utility conflicts, there is a need to find out the root causes of these conflicts which may be of various sources. The purpose of this paper is to analytically review the causes of utility conflicts underground. This information will help researchers, surveyors and utility providers to identify the main causes of utility conflict in order to avoid utility damage.

## 2.0 Utility Conflicts

Utility conflicts are unfortunately common incidents in many construction projects. It occurred when many cables, gas pipelines, fibre optic cables and sewerages were buried in the same line. Understanding the causes of utility conflicts will help utility agencies to better understand the risk of utility conflicts on future projects.

Two critical factors that contribute to inefficiencies in construction project development process are the lack of accurate information about utility facilities that might be in conflict with the project and the resolution and overall management of those conflicts [1]. These factors can cause a variety of problems such as disruptions when utility installations are encountered unexpectedly during construction, either because there was no previous information about those installations or because their stated locations on the construction plans were incorrect; damage to utility installations which can disrupt utility service, damage the environment, endanger the health and safety of construction workers and the public; and delays that can extend the period of project development or delivery and increase total project costs.

## 3.0 Matrix of Causative Factors

Mapping of causative factors is to give a preliminary idea on what past researchers have discovered about the factors that contributed to big implications. This matrix analysis can identify the severity of each factor based on the frequency of the factors identified by past researchers around the world. Based on the 21 scholarly research papers, articles and reports selected for this study, 18 implications of utility conflicts were found and grouped into 5 categories. Table 1 shows the mapping of the causative factors taken from selected research articles around the world. These can be part of the input for developing the framework and policy to determine the relevancy of these factors to underground utility.

**Table 1:** Matrix of Causes of Utility Conflicts

| CAUSES \ IMPACTS | Injuries | Property damages | Construction delays | Utility service breakdowns | Redesign | Deaths | Claims | Traffic delays | Costly conflicts | Environmental problems | Duplication data | Economy Quality of life | Public Health | Business disruptions | Limit exchange | Limited sharing | Utility conflicts | F | % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lack of reliable information | [2] | [2] | [2] | [2] | [2] | [2] | [2] | [2] | | [2] | | | | [2] | | | | 10 | |
| | | | | | | | | | | [3] | | [3] | [3] | [3] | | | | 4 | |
| | [4] | | [4] | [4] | [4] | [4] | | [4] | | | | | | | | | | 6 | |
| | | [5] | [5] | [5] | | | | [5] | | | | | | | | | | 4 | |
| | [6] | [6] | [6] | [6] | [6] | [6] | [6] | | [6] | | | | | | | | | 8 | |
| | | | [7] | | | | | | | | | | | | | | | 1 | |
| | | [8] | | [8] | | | | | | | | | | | | | | 2 | |
| | [9] | [9] | [9] | | | | | | | | | | | | | | | 3 | |
| | | [10] | | | | | | | | | | | | | | | | 1 | |
| | [11] | | | | [12] | | | | | | | | | | | | [12] | 3 | |
| | [13] | | | | | | | | | | | | | | | | | 1 | |
| | [14] | | | [13] | | | | | | | | | | | | | | 2 | |
| | [15] | | | | | | | | | | | | | | | | | 1 | |
| | | | | | | | | | | | | | | | | | | ∑ = 46 | 67.64 |
| Lack of coordination, cooperation and communication | [12] | | [16] | | [16] | | [16] | | | | [17] | | | | [17] | [17] | | 7 | |
| | [14] | | | | | | | | | | [18] | | | | | | | 2 | |
| | [19] | | | | | | | | | | | | | | | | | 1 | |
| | [20] | [20] | | | | [20] | [20] | | | | | | | | | | | 4 | |
| | | | | | | | | | | | | | | | | | | ∑ = 14 | 20.59 |
| Lack of standardized requirements for work | | [21] | | | | | | | | | | | | | | | | 1 | |
| | [19] | [19] | | [19] | | [19] | | | | | | | | | | | | 4 | |
| | | | | | | | | | | | | | | | | | | ∑ = 5 | 7.35 |
| Lack of skills and knowledge | [13] | | | | | | | | | | | | | | | | | 1 | |
| | [15] | | | | | | | | | | | | | | | | | 1 | |
| | | | | | | | | | | | | | | | | | | ∑ = 2 | 2.94 |
| Lack of safety awareness and low professionalism and standards within the utility survey industry | | | [22] | | | | | | | | | | | | | | | 1 | |
| | | | | | | | | | | | | | | | | | | ∑ = 1 | 1.47 |
| ∑ | 15 | 9 | 8 | 7 | 5 | 5 | 4 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 68 | |

# 4.0 Results and Discussion

Based on Table 1, the causal factor that has the highest frequency is Lacking reliable information about underground utility data. This factor is acknowledged by 14 out of 21 articles considered in this study and has brought big implications to utility conflicts. The significant factors for other categories are as in Table 2.

**Table 2:** Root Causes of Implications

| Root Causes | F |
|---|---|
| 1. Lack of reliable information | 67.64 |
| 2. Lack of coordination, cooperation and communication | 20.59 |
| 3. Lack of standardized requirements for work | 7.35 |
| 4. Lack of skills and knowledge | 2.94 |
| 5.Lack of safety awareness and low professionalism, and standards within the utility survey industry | 1.47 |

## 4.1 Lack of reliable information

'Lack of Reliable Information' is the most dominant cause of generating utility conflicts and having the highest frequency among other factors. The lack of reliable information on underground utilities not only can result in property damages, construction delays, design changes, costly conflicts, claims, injuries, deaths, traffic delays, local business disruptions, environmental problems, but also utility service breakdowns. These problems arise because the location of underground utilities might be found on plans and records, but the utility locations are not exactly as recorded or the records do not fully account for the buried utility systems. Accurate data and information can protect the utility asset from damage.

## 4.2 Lack of coordination, cooperation and communication (3C's)

'Lack of adequate coordination, cooperation and communication' (3C's) between project owners, utility providers, contractors, authorities, and the inability to accurately and comprehensively identify the location of underground utilities are measurable contributors to utility problems. Good 3C's between the project owners, contractors and utility providers may avoid utility conflicts. 4.2.3 Deed restricted mortgages

## 4.3 Lack of standardized requirements for work

'Lack of standardized requirements for underground utility work' was a main concern and the survey standards vary from each utility provider. Different providers conducted surveys in different ways and many are not in accordance with the procedure requirements. The process of installing and maintaining underground utilities will become even more difficult, and improper procedures may sometimes impose threats to the surrounding work areas and drive severe casualties. For instance, malpractice could damage gas pipes which can result in gas leaks, fires and explosions or even injuries to nearby workers and the general public.

## 4.4 Lack of safety awareness and low professionalism, and standards within the utility survey industry

Safety awareness, work professionally and proper use of utility standards can avoid utility conflicts. Conflicts can be further voided if all parties involved comply with the rules and standards of work and have the required skills and experience.

## 4.5 Lack of skills and knowledge

Producing inaccurate utility information due to lack of knowledge in handling utility equipments and skills in data interpretation can lead to inaccurate utility locating. This can cause accidents during excavation, which could lead to costly repairs and disruption to utility services. Thus, training is an important aspect of utility mapping to ensure quality job and need to be continuously on going for any organization to sustain its presence in this field of practice.

'Lack of Reliable Information' is the most dominant cause of generating utility conflicts and having the highest frequency among other factors

## 5.0 Conclusion

Utility conflicts by digging activities have brought about significant impacts in many countries. This review study of 20 research papers and reports found out that the most significant factor contributing to underground utility implications is the 'Lack of reliable information'. Meanwhile 'Lack of coordination, communication and cooperation', 'Lack of standardized requirements for work', 'Lack of safety awareness and low professionalism, and standards within the utility survey industry', and 'Lack of skills and knowledge' are also causes for generating implications. In the preliminary stages, these on-going results can be used to find out an effective mechanism to minimize the factor of 'Lack of reliable information'.

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# An overview of the Red Book Standard on Preliminary Valuation Advice and Client Discussions

"As it is fundamental to the integrity of the valuation process, all members practising as valuers must have the appropriate experience, skill and judgment for the task in question and must always act in a professional manner free from any undue influence, bias or conflict of interest".

(RICS Valuation – Professional Standards 2014, p17)

It has become increasingly common for valuers in Malaysia to provide their clients with preliminary valuation advice or a draft valuation or report in advance of the final valuation report. Corporate valuations and valuations for submission to the Securities Commission are some of the main instructions which usually necessitate such arrangement. Research shows that this practice is also common in countries such as the UK and New Zealand (Baum et al., 2000; Levy and Schuck, 1999). In the UK, for example, draft valuation meetings are an essential part of periodic performance valuations of property funds which contribute valuation data for the Investment Property Databank (IPD) indexes. Studies on client influence on valuations have highlighted the potential advantages and disadvantage of draft valuation meetings on valuation outcomes (Levy and Schuck, 2005; Kamalahasan, 2012). It seems that the potential increase in the accuracy of the information underpinning the valuation can be set off against the potential impact on the outcome of the valuation improperly. In the case of periodic valuations, the use of draft valuation meetings to enhance the performance bonuses of fund managers has also been cited.

In fact, Baum et al. (2000) were the first put the spotlight on the practice of draft valuation meetings between clients and valuers in the UK and the RICS responded by setting up the Carsberg Committee which reported in 2002. This review called for the need to record the outcomes of client-valuer discussions and meetings in order to demonstrate the level of impartiality of such valuations. The RICS acknowledged this need and introduced new practice statements into its mandatory valuation standards commonly known as the 'Red Book'. The latest edition of the Red Book (2014) incorporates these standards under the Professional Standards (PS) 2 – Ethics, competency, objectivity and disclosures[1]. This section of the Red Book mainly advises valuers of the potential influence of client discussions on value opinion and the kind of information that should be recorded from draft valuation meetings. The relevant standards of PS 2 are provided in the information box below.

Valuers, on the other hand, are required to inform their clients of the limitations of this preliminary advice particularly about issues of material importance to the subject valuation. As far as valuers are concerned, these are standard caveats which they would have to adhere to from time to time in order to safeguard their liability as professional valuers

Firstly, although the term "preliminary valuation advice" is not specifically defined in the Red Book, it is clear from reading PS 2 that it refers to two forms – draft valuation amount and draft valuation report. It should be noted that the preliminary or draft valuation amount or report is provided during the course of completion of a valuation by the same valuer currently engaged by the client[2]. Depending on the requirement of the client and purpose of valuation, the draft valuation amount is generally more demanded by clients in practice than the draft report itself. This is self-explanatory. The draft form, be it a figure or report must be subject to the completion of the final report and therefore must not be published or disclosed to third party prior to completion of the valuation instruction. It is also stated in the standard that clients can only use the draft figure or report for internal purposes. Internal purposes may refer to uses such as discussions and verifications at individual or company level. Hence, they are not allowed to quote the valuation amount or utilise the draft valuation report for the purpose for which it is required before the final valuation report is received from the valuer. Valuers, on the other hand, are required to inform their clients of the limitations of this preliminary advice particularly about issues of material importance to the subject valuation. As far as valuers are concerned, these are standard caveats which they would have to adhere to from time to time in order to safeguard their liability as professional valuers.

However, what could be professionally more challenging for valuers under PS 2 is to show evidence that any discussions and exchange of information with clients at the preliminary stage have not changed their opinion of value. This process starts from the moment client is informed of the preliminary opinion of value. Section 4.14 of PS 2 requires valuers to keep file notes of discussions with the client, in particular, the information or suggestions provided by the client relating to the subject valuation. The discussions may include telephone conversations, e-mails and face-to-face meetings. More importantly, valuers have to explain in

[1] The previous edition of the Red Book (2012) reported these standards under its Valuation Standards 6 - Valuation reports or more specifically under VS 6.11- Preliminary valuation advice.

[2] suggesting that "preliminary valuation advice" differs from verbal indicative values requested by clients prior to formal instruction as we experience in Malaysia

## PS 2 Ethics, competency, objectivity and disclosures

### 4 Independence, objectivity and conflict of interest

4.10 A threat to member's objectivity can arise where the outcome of a valuation is discussed before its completion with either the client or another party with an interest in the valuation. While such discussions are not improper, and indeed may be beneficial to both the member and the client, the member must be alert to the potential influence that such discussions may have on his or her fundamental duty to provide an objective opinion. Where such conversations take place, the member must make a written record of any meetings or discussions, and whenever the member decides to alter a provisional valuation as a result, the grounds for doing so must be carefully noted.

4.11 The member may need to discuss various matters, such as the verification of facts and other relevant information (for example, confirming the outcome of rent reviews or clarifying the boundaries of a property), before forming a preliminary opinion of value. At any stage in the valuation process, such discussions give the client an opportunity to understand the member's viewpoint and evidence. It is expected that the client would disclose facts or information, including information about transactions in the property, asset or liability, relevant to the valuation task.

4.12 In providing a client with preliminary advice, or a draft report or valuation in advance of its completion, the member must state that:

- the opinion is provisional and subject to the completion of the final report
- the advice is provided for the client's internal purposes only and
- the draft is on no account to be published or disclosed.

If any matters of fundamental importance are not reflected, their omission must also be declared.

4.13 Where discussions with a client occur after the provision of preliminary material or opinions, it is important that such discussions do not, and can be shown not to, lead to any perception that the member's opinion has been influenced by those discussions, other than to correct inaccuracies or incorporate any further information provided.

4.14 To demonstrate that the discussions have not compromised the member's independence the file notes of discussions with the client on draft reports or valuations should include:

- the information provided, or the suggestions made, in relation to the valuation
- how that information was used to consider a change in material matters or opinions and
- the reasons why the valuation has or has not been changed.

4.15 If requested, this record should be made available to auditors or any other party with a legitimate and material interest in the valuation.

(Source: RICS Valuation – Professional Standards (2014, p21-22))

their file notes how the 'new' information provided by their client changed the preliminary value, if any. Valuers are also required to record their reasons for not revising the preliminary value opinion post-client discussions. This simply means valuers have to clarify the thought process behind their value opinion in their file notes. Presumably, this would not be a difficult task for a valuer who complies with the standing issues pertaining to verbal indications given to clients ahead of the In hindsight, such notes if professionally done would help both the valuer and client to understand the valuation outcome better particularly in future assignments and reduce any lingering doubts on the integrity of the value opinion. However, one of the problems in this recording of client discussions is the level of transparency that should be expected from valuers. This is mainly because transparency of property market and valuation varies across countries and it may affect the level of disclosure of subject property information to third parties. Moreover, data disclosure agreement between the valuer and client may prohibit certain information pertaining to subject property such as trade secrets and customer information from being revealed in the valuation report or kept in the file notes. Hence, there could be restrictions as to the type and depth of information that can be recorded in the file notes. However, Malaysia as one of the leading transparent markets in the region and a country with an established valuation profession may find little difficulties in adhering to the new provisions of PS 2 or is it? In fact, valuations prepared for submission to the

Securities Commission Malaysia (SC) have to comply with additional disclosure rules as per the SC's "Guidelines on Asset Valuations". One other purpose of valuation for which PS 2 can be useful is financial reporting, particularly in the determination of fair value of an asset or liability for inclusion on the financial statements of listed companies. Studies show that accounting the fair value of fixed assets and investment properties brings about different implications to the financial health of public listed companies and are potentially vulnerable to creative accounting.

Therefore, similar provisions such as PS 2 should be considered for inclusion in our own 'Red Book', Malaysian Valuation Standards if it could further enhance the reputation of the valuation profession in this country. Perhaps, these provisions could also address some of the long-standing issues pertaining to verbal indications given to clients ahead of the valuations proper.

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# Technical Criteria of an Adjudicator

An Adjudicator has 45 working days under CIPAA to make the Adjudication Decision. In view of the likely complexity of the dispute in question that involves multi-facets of construction disputes, the technical criteria to appointing an adjudicator may comprise knowledge and skills in areas related to typical issues in dispute, such as, valuation of variations, extension of time assessment, contract administration and Malaysian construction law.

**Keywords:** adjudicator, knowledge and skills, 45 working days, claims and counter-claims

## 1.0 Introduction

The Construction Industry Payment and Adjudication Act 2012's (CIPAA 2012) main objective is to provide a new yet expedient legal avenue to resolve cash flow-related problems in the Construction industry. CIPAA 2012 provides for an adjudicator to make an adjudication decision within 45 working days from a service of an Adjudication Response or an Adjudication Reply if such reply is served. Given the likely complexity of the dispute in question that involves multi-facets of construction disputes, what is the technical criteria to appointing an adjudicator apart from impartiality, independence and ability to uphold natural justice?

## Typical Issues in Dispute

CIPAA 2012 provides for a payment claim to be initiated by an unpaid party, say, a Contractor. In this instance, the payment claim is a claim for payment of a construction work done pursuant to express terms of a construction contract. For example, the Contractor carried out a variation work instructed by an Architect's Instruction where no contract rate is applicable. However, the Architect only certified 50% of the Contractor's variation claim on the ground that the Contractor's rate is inflated above the market rate. The Contractor is disputing the Architect's certification as an under-certification and thus claims the balance of its variation claim against an Employer as a payment claim under CIPAA 2012. The Employer in turn serves a payment response on the Contractor under CIPAA 2012 denying any under-certification and counter-claiming liquidated damages for the Contractor's delays.

In view of the Employer's dispute of the Contractor's payment claim, the Contractor has no other alternative but to commence an adjudication proceeding.

After the appointment of an adjudicator, the Contractor serves an Adjudication Claim upon the Employer claiming for the full variation claim amount. The Employer in turn serves an Adjudication Response disputing the Contractor's rate and maintaining the Architect's certification and the Quantity Surveyor's valuation as reflecting the market rate for the variation. Further, the Employer counter-claims liquidated damages for the Contractor's delay. In reply to the Employer's counter-claim, the Contractor serves an Adjudication Reply denying any responsibility for the delay and attributing the delay to the variation work instructed by the Architect thus claiming an extension of time by way of a critical path method of delay analysis. Further, the Contractor asserts that the Architect has not issued any valid Certificate of Non-Completion which is a condition precedent to the Employer's deduction of liquidated damages and that the Employer has suffered no actual loss.

In view of the Employer's dispute of the Contractor's payment claim, the Contractor has no other alternative but to commence an adjudication proceeding. After the appointment of an adjudicator, the Contractor serves an Adjudication Claim upon the Employer claiming for the full variation claim amount

As evident above, although the dispute initially appears to be quite simple with the service of the payment claim, it grows in complexity when the Employer makes a counter-claim against the Contractor for liquidated damages. Such complexity is further exacerbated by the Contractor's claim for an extension of time demonstrated by the critical path method of delay analysis. Accordingly, the adjudicator has to consider several issues in dispute as follows:

(i) Whether the variation claim should be valued based on the Architect's rate or the Contractor's rate;
(ii) Whether the Contractor has demonstrated an entitlement to the extension of time by way of its critical path method of delay analysis;
(iii) If the Contractor is not entitled to any extension of time, whether the Architect has issued a valid Certificate of Non-Completion.
(iv) If so, whether Employer is entitled to deduct any liquidated damages from any monies due to the Contractor.

## Decision Making Factors

The Adjudicator has a period of 45 working days or any other extended period agreed by both the Contractor and the Employer to make an Adjudication Decision that deals with the issues in dispute above.

In order to make a decision in respect of the issues in dispute, the Adjudicator has to consider the following factors as summarized in a diagram chart below:

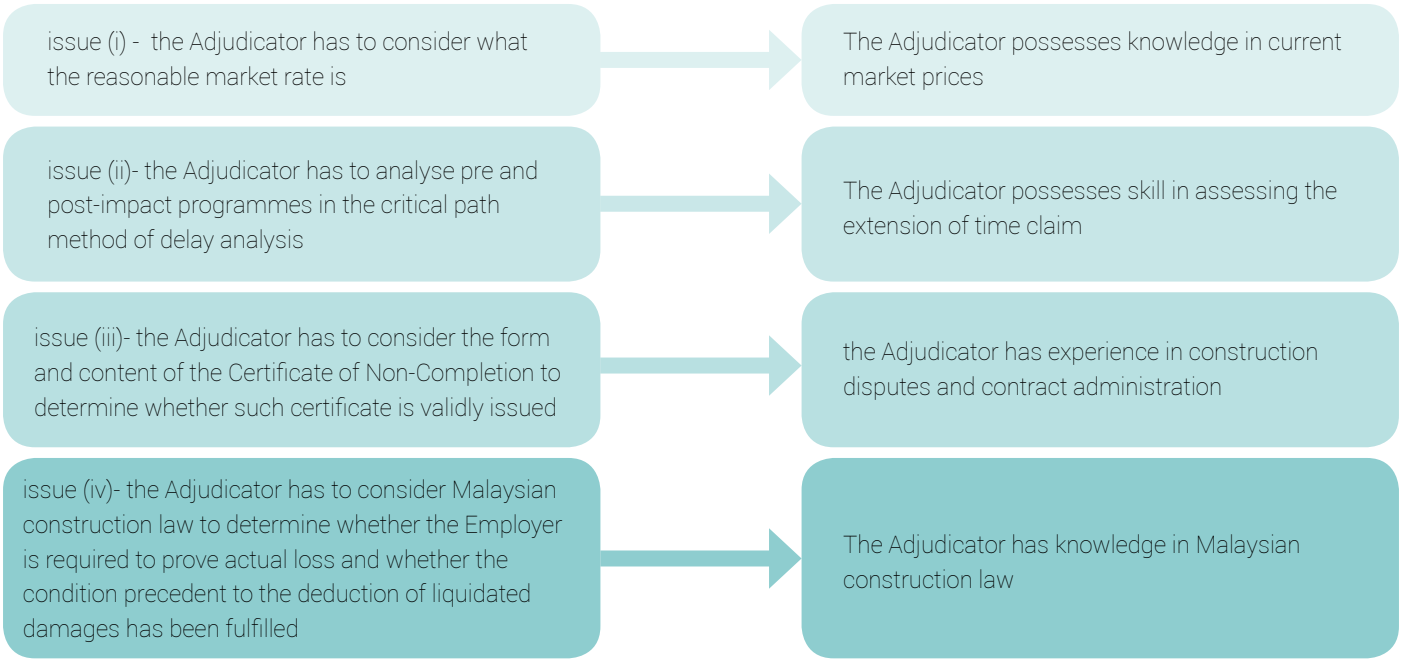
a) In respect of issue (i), the Adjudicator has to consider what the reasonable market rate is and then use it as a basis to find whether the Architect's rate and the Contractor's rate is a reasonable rate for the valuation of the variation. In this respect, the Adjudicator may, with the consent of

the parties and pursuant to Section 25(e) of CIPAA 2012, appoint an independent expert to give evidence as to what the reasonable market rate is. However, if one of the parties does not give the consent due to cost and time constraints, then the Adjudicator is bound to make a decision based on available information submitted by the parties. Nonetheless, it is likely the parties have appointed the Adjudicator who possesses knowledge in current market prices and thus he/she is able draw on his/her own knowledge in accordance with Section 25(d) of CIPAA 2012.

b) In respect of issue (ii), the Adjudicator has to analyse pre and post-impact programmes in the critical path method of delay analysis so as to ascertain the extent of any impact of the variation work on milestone completion dates therein. Similar to paragraph (a) above, the Adjudicator may, with the consent of the parties and pursuant to Section 25(e) of CIPAA 2012, appoint an independent delay analysis expert to assess the Contractor's extension of time claim and to report what the Contractor's likely entitlement to extension of time is. Given the lack of consent by any one of the parties due to cost and time constraints, particularly after the dispute having arisen, it may be that the Adjudicator is compelled to make a decision without the assistance of the expert thus giving rise to a risk of error in his/her decision. Be that as it may, it is likely the parties have appointed the Adjudicator who possesses skill in assessing the extension of time claim. Therefore, the Adjudicator is able to draw on his/her own skill in finding whether the Contractor is entitled to the extension of time.

c) In respect of issue (iii), the Adjudicator has to consider the form and content of the Certificate of Non-Completion against those prescribed in the Contract to determine whether such certificate is validly issued. The Adjudicator has to take into account of any case-law authority submitted by the parties in this respect and understand the legal principles therein before applying them to the issue in question. It is likely the parties have appointed the Adjudicator who has experience in construction disputes and contract administration. Hence, the Adjudicator is able to draw on his/her own knowledge, experience and skill.

d) In respect of issue (iv), the Adjudicator has to consider the present authorities in Malaysian construction law to determine whether the Employer is required to prove actual loss and whether the condition precedent to the deduction of liquidated damages has been fulfilled under the Contract in deciding the Employer's entitlement, if any, to liquidated damages. In order to do so, the Adjudicator has to



possess knowledge in construction law when considering any case-law authority submitted by the parties before applying legal principles therein to the issue in question. It is likely the parties have appointed the Adjudicator who has knowledge in construction law particularly that of Malaysia. Hence, the Adjudicator is able to draw on his/her own knowledge.

## Conclusion

In light of the above, it may be concluded that if the Adjudicator were to make the Adjudication Decision within the 45 working days period which may be a relatively short period depending on the complexity of the dispute where the availability of assistance from any independent expert is unlikely, the Adjudicator may have to possess knowledge and skills in areas related to typical issues in dispute and thus draw upon his/her own knowledge to expedite the making of the Adjudication Decision. Accordingly, the technical criteria to appointing the Adjudicator may comprise such knowledge and skills, such as, valuation of variations, extension of time assessment, contract administration and Malaysian construction law.

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## Disclaimer

This article represents the view of the author alone, and not any organization to which the author is associated/attached.

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# Building Condition Assessment (BCA):

## Kajian Kes Bangunan Stesen Komuter Klang

**Abstrak:** Pengenalan Building condition Assessment (BCA) kepada seluruh bangunan kerajaan di Malaysia memberikan impak positif khususnya dalam menyumbang kepada salah satu keperluan 'Building Performance Assessment' sebagaimana keperluan dalam Tatacara Pengurusan Aset Tak Alih Kerajaan (TPATA). Untuk tujuan ini, pihak BSFB, JKR dengan kerjasama Jabatan Ukur Bangunan, UiTM (Perak) telah melakukan pemeriksaan bersama di Bangunan Stesen Komuter Klang (SKK) sebagai kajian kes. Tujuan utama pemeriksaan bangunan ini adalah untuk memenuhi keperluan

untuk membuat penilaian terhadap bangunan bagi projek berkonsepkan 'Park & Ride' di SKK. Objektif utama adalah untuk memastikan kefungsian, keselamatan, keperluan operasi dan penyenggaraan asset dapat dilaksanakan dengan berkesan. Hasil daripada penemuan kajian mendapati, bangunan ini diberi penarafan 11.79 (sederhana). Walaupun secara keseluruhan taburan kecacatan dan kerosakan bangunan adalah tidak membimbangkan, terdapat 4% kecacatan dan kerosakan bangunan berada dalam skor 21-25 iaitu pada tahap yang sangat kritikal. Ini bermaksud pihak bertanggungjawab hendaklah mengambil perhatian serius kerana kerosakan dan kecacatan elemen dan komponen bangunan ini boleh mendatangkan kecelakaan dan perlu pembaikian dan penggantian yang segera dan sekiranya perlu hendaklah dirujuk kepada pemeriksaan pakar atau pihak yang bertauliah. Penemuan juga mendapati bahawa keadaan bangunan ini boleh terdedah kepada risiko yang berbahaya, kegagalan kepada pengoperasian dan keselesaan pengguna bangunan serta memendekkan jangka hayat bangunan.

**Abstract:** The introduction of building condition assessment (BCA) to all government buildings in Malaysia particularly give a positive impact in contributing to building performance assessment as a main requirement in Tatacara Pengurusan Aset Tak Alih Kerajaan (TPATA). For this purpose, Bahagian Senggara Fasiliti Bangunan, Jabatan Kerja Raya Malaysia in collaboration with Jabatan Ukur Bangunan, UiTM (Perak) has conducted a joint inspection in the Klang Commuter Station Building as a case study. The aim of an inspection is to make an assessment for the existing building in conjunction with the project 'Park & Ride' concept which will be implemented at the Klang Commuter Station. The primary objective of a study is to ensure functionality, safety, operation and maintenance of the asset which needs to be implemented in effective condition. As a result, the building is rated at 11.79 which is in fair condition. Despite the fact that the overall distribution of defects and damage to buildings is not serious, if it has 4% of defect and damage and the building is within the 21-25 score, it is at a very critical stage. This means that the responsible parties must take it seriously because of malfunctions and defects of the building elements and components which could result in an accident. Furthermore, the building also needs a contingency repair and replacement and if necessary, it shall be referred to an expert examination for further clarification. Findings also showed that the existing conditions of the building may be exposed to dangerous risks, failure to operate and discomfort to building user and shortens the lifespan of the building.

**Keywords:** Building Condition Assessment (BCA), Building Assessment Rating System (BARS), Tatacara Pengurusan Aset Tak Alih Kerajaan (TPATA), Penarafan Bangunan, JKR

## 1.0 PENDAHULUAN

Building Condition Assessment (BCA) telah diperkenalkan dan diluluskan pengunaannya pada 28hb Februari 2014 kepada seluruh bangunan kerajaan di Malaysia. Arahan ini berkuatkuasa pada traikh tersebut dan digunapakai untuk semua peringkat pejabat JKR yang terlibat dalam melaksanakan program pemeriksaan bangunan. BCA ini merangkumi Garis Panduan dan Borang Semak Pemeriksaan Keadaan Bangunan serta menggunakan Building Assessment Rating System (BARS). Secara keseluruhannya, penarafan keadaan fizikal bangunan ini dilaksanakan adalah sebagai menyumbang kepada salah satu keperluan 'Building Performance Assessment' sebagaimana keperluan dalam Tatacara Pengurusan Aset Tak Alih Kerajaan (TPATA).

Berpandukan kepada Pekeliling dan Peraturan yang berkuatkuasa iaitu Perintah Am Bab E, Klausa 27 memberitahu bahawa Jabatan Kerja Raya (JKR) bertanggungjawab memeriksa bangunan kerajaan setiap tahun. Selain itu, Akta Jalan, Parit & Bangunan 1993, Akta A903 [Seksyen 85 (A)] menekankan bahawa adalah mandatori bagi bangunan-bangunan diperiksa oleh Jurutera Profesional untuk mengesan apa-apa kemerosotan dan kecacatan pada bangunan.

Bagi memastikan bangunan kerajaan sentiasa berada dalam keadaan yang memuaskan, penggunaan BCA ini secara tidak langsung membantu menghasilkan capaian data dan maklumat keadaan bangunan dengan cepat serta memastikan keupayaan aset berfungsi sebagaimana diperlukan (acceptable standard).

## 2.0 LATAR BELAKANG BANGUNAN

Stesen Komuter Klang telah dibina dalam tahun 1890. Ia dibina adalah untuk menggantikan stesen asal sedia ada iaitu Stesen Bukit Kuda yang telah digunakan semenjak landasan keretapi Selangor pertama disiapkan pada tahun 1875 yang mana terletak 3 KM dari Bandar Klang. Kerajaan negeri pada masa tersebut menghadapi kekangan bajet yang tinggi dan menyebabkan pembinaan landasan terhenti bagi menghubungkan sempadan selatan Bandar Klang. Bagi memenuhi dan menampung pertumbuhan penduduk dan pengangkutan di Bandar Klang, Kerajaan telah membina Jambatan Besi merentasi Sungai Klang dengan kos pembinaan 94,000.00 dollar termasuk Stesen Komuter Klang.

Kerajaan telah membuat keputusan untuk membina satu Pelabuhan baru iaitu Pelabuhan Swettenhem atau dikenali sebagai Pelabuhan Klang. Dalam tahun 1895 hingga 1901 pembinaan landasan sepanjang 6 KM disambung dari Stesen Komuter Klang ke Pelabuhan Kelang bagi memudahkan pengangkutan pada masa itu dan sekarang.

Lima (5) tahun kemudian, jeti Klang telah mencapai tahap kapasiti maksimum pengangkutan terutama produk tin dan kopi. Justeru itu, Kerajaan telah membuat keputusan untuk membina satu Pelabuhan baru iaitu Pelabuhan Swettenhem atau dikenali sebagai Pelabuhan Klang. Dalam tahun 1895 hingga 1901 pembinaan landasan sepanjang 6 KM disambung dari Stesen Komuter Klang ke Pelabuhan Kelang bagi memudahkan pengangkutan pada masa itu dan sekarang.

## 3.0 TUJUAN DAN OBJEKTIF KAJIAN

Tujuan utama laporan pemeriksaan keadaan bangunan ini dihasilkan untuk merekodkan kerosakan dan kecacatan sedia ada yang terdapat pada bangunan Stesen Komuter Klang, Selangor. Pemeriksaan ini dijalankan susulan daripada permohonan pihak Pengurus Projek Cawangan Pangkalan Udara dan Maritim (CPUM) JKR untuk membuat penilaian berkaitan kos pembaikan kerosakan bangunan Stesen Komuter Negeri Selangor bagi projek Cadangan Merekabentuk, Membina, Menaiktaraf dan Menyiapkan Tempat Letak Kereta Bertingkat yang diintegrasi dengan bangunan stesen komuter bertingkat di Stesen Komuter Klang (Park & Ride) pada 7hb Januari 2014.

Objektif pemeriksaan bangunan ini dijalankan adalah sebagai memenuhi keperluan berikut:

a) Memastikan kefungsian, keselamatan dan keselesaan penghuni bangunan;
b) Memastikan keperluan operasi dan penyenggaraan asset dapat dilaksanakan dengan mudah dan berkesan;
c) Memberikan keyakian kepada pengguna bangunan terhadap asset yang diterima.

## 4.0 SKOP KAJIAN

Skop pemeriksaan bangunan adalah meliputi perkara berikut:

a) Pemeriksaan bangunan secara komprehensif Skop pemeriksaan bangunan dijalankan secara komprehensif meliputi semua elemen bangunan seperti bumbung, siling, pintu, tingkap, dinding, kerja luar, perpaipan, sanitari, ramp, lantai dan tiang.
b) Penyediaan Lukisan Terukur Pengukuran semula di tapak berdasarkan ukuran sebenar dilaksanakan oleh BSFB bersama dengan pasukan pemeriksa dari UiTM (Perak). Arahan Kerja Selamat (JKR. AKS.13) untuk penyenggaraan dan Pemeriksaan Bangunan akan dipatuhi dan diberikan kepada pasukan pemeriksa yang terlibat dengan pemeriksaan dan kerja terukur ini. Semua ukuran diambil oleh pasukan pemeriksa dan diserahkan kepada pihak HODT Arkitek selaku pihak yang akan menyedia, menyemak dan mengesahkan lukisan terukur yang disediakan. Ini adalah selaras dengan Arahan KPKR bil 15/2012 mengenai penyediaan lukisan terukur yang terpakai oleh semua peringkat pejabat JKR.
c) Teg Ruang
Teg ruang dilaksanakan untuk keseluruhan ruang bangunan Stesen Komuter Klang, Selangor sebagaimana pematuhan kepada keperluan Sistem Kod Aset Tak Alih (SKATA) Kerajaan bagi tujuan Daftar Aset Khusus (DAK).

## 5.0 LIMITASI KAJIAN

Pemeriksaan ini juga terhad kepada bahagian-bahagian yang boleh diakses sahaja. Tidak ada sebarang ujian terhadap kerosakan dan kecacatan dilakukan. Segala maklumat dan gambar-gambar yang berkaitan kecacatan/ kerosakan dikumpulkan untuk analisis.

## 6.0 PROSEDUR KERJA PEMERIKSAAN BANGUNAN

Prosedur pemeriksaan bangunan adalah prosedur standard yang perlu dijalankan mengikut kepada prosedur yang telah ditetapkan. Berdasarkan amalan daripada pasukan pemeriksaan daripada JKR, prosedur yang telah digunakan dalam menjalankan pemeriksaan di bangunan ini adalah seperti berikut:

### 6.1 Langkah 1

i) Pemeriksaan Awalan
a) Membuat dokumentasi semua penemuan/Maklumat yang diperolehi semasa permeriksaan awalan dijalankan.
b) Mendapatkan pelan tapak, pelan lukisan siap bina dari pihak berkenaan.
c) Mengkaji latar belakang bangunan.

### 6.2 Langkah 2

i) Menjalankan pemeriksaan luaran.
a) Pemeriksaan persekitaran dan luaran bangunan.
b) Pemeriksaan dari segi lokasi, sistem perparitan dan loji rawatan kumbahan

ii) Menjalankan pemeriksaan dalaman
a) Pemeriksaan ruang bumbung
b) Pemeriksaan bilik ke bilik/ ruang ke ruang/ aras ke aras
c) Pemeriksaan ruang bawah tanah.

### 6.3 Langkah 3

i) Pematuhan kepada skala pemeriksaan bangunan (BARS)
a) Tahap keadaan fizikal komponen bangunan (rujuk jadual 1.1)
b) Tahap keutamaan tindakan penyenggaraan bangunan (rujuk jadual 1.2)

**Jadual 1.1:** Tahap keadaan fizikal komponen bangunan
Sumber: BSFB, JKR (2013)

| Gred | Skala Pemeriksaan | Ringkasan | Huraian |
|---|---|---|---|
| 1 | Sangat baik | SB | • Tiada Kecacatan:<br>• Keadaan sangat baik; dan<br>• Boleh berfungsi dengan baik |
| 2 | Baik | B | • Terdapat kecacatan atau kerosakan minor<br>• Keadaan baik; dan<br>• Boleh berfungsi dengan baik |
| 3 | Sederhana | S | • Terdapat kecacatan atau kerosakan major<br>• Keadaan sangat baik; dan<br>• Masih Boleh berfungsi tetapi perlu dipantau |
| 4 | Kritikal | K | • Tiada/terdapat kecacatan atau kerosakan major / minor<br>• Keadaan Kritika; dan<br>• Tidak dapat befrungsi mengikut tahap perkhidmatan dipersetujui |
| 5 | Sangat Kritkal | SK | • Keadaan sangat kritikal<br>• Tidak dapat befrungsi; dan<br>• Berisiko yang boleh menyebabkan kecelakaan dan / atau kecederaan |

**Jadual 1.2:** Tahap keutamaan tindakan penyenggaraan bangunan
Sumber: BSFB, JKR (2013)

| Keutamaan | Skala Penilaian | Ringkasan | Huraian |
|---|---|---|---|
| Normal | 1 | N | • Tiada tanda kecacatan kerosakan<br>• komponen / elemen disenggara dengan baik, tiada keperluan pembaikan |
| Rutin | 2 | R | • Kerosakan / kecatan minor<br>• Perlu dipantau, dibaiki dan diganti untuk mengelakkan kecacatan / kerosakan yang lebih serius |
| Pembaikan | 3 | PB | • Kerosakan / kecatan major<br>• Perlu pembaikan major, perlu dibaiki / diganti |
| Pemulihan | 4 | PM | • Kerosakan / kecatan serius<br>• Keperluan kepada pembaikan yang mendesak, perlu segera dan serta merta |
| Penggantian | 5 | PG | • Kerosakan / kecatan sangat serius<br>• Keperluan kepada penggantian / pembaikan yang mendesak, perlu segera dan serta merta<br>• Memerlukan pemerikssan terperinci pakar |

## 6.4 Langkah 4

i) Pengisian borang pemeriksaan

a) Pengisian borang pemeriksaan (BPKB/ JKR/01) yang memerlukan beberapa maklumat dicatatkan seperti pemeriksa bertanggungjawab, tarikh, cuaca, masa pemeriksaan, lokasi danjenis ruang, elemen dan komponen yang diperiksa, jenis kecacatan dan kerosakan bangunan, keterangan kecacatan dan kerosakan bangunan dan cadangan penambahbaikan.

b) Pengisian borang pemeriksaan dalam dan luar bangunan mengikut kepada jenis ruang yang terdapat di dalam bangunan. Sebagai contoh, ruang /bilik pejabat, stor, utility, ruang tamu, bilik tidur dan sebagainya.

c) Pengisian borang pemeriksaan mekanikal dan elektrikal. Sebagai contoh ruang bilik AHU, bilik server dan sebagainya.

d) Pengisian porang pemeriksaan Kerja Luar meliputi prasarana seperti jalan, dataran kejat, retikulasi bekalan air, system pembentungan dan sebagainya.

## 6.5 Langkah 5

i) Pengisian helaian kecacatan (defect sheet) berpandukan kepada semakan jadual jenis kecacatan dan kerosakan umum bangunan, kecacatan dan kerosakan umum mekanikal dan elektrik serta mengkaji punca-punca berlaku kecacatan dan kerosakan yang dikeluarkan dan diguna pakai oleh JKR.

## 6.6 Langkah 6

i) Pelan indikasi kecacatan (defect indication plan) merupakan pelan terkini bangunan ini dan disertakan dengan indikasi terkini lokasi berlaku kecacatan dan kerosakan bangunan seperti yang disenaraikan di dalam jadual kerosakan bangunan.

## 6.7 Langkah 7

i) Ringkasan Penemuan merupakan hasil kajian (outcome) yang didapati

**Jadual 1.3:** Rating skor keseluruhan bangunan Sumber: BSFB, JKR (2013

| Rating | Keadaan / Kondisi | Matrik Tindakan | Skor |
|---|---|---|---|
| A | Sangat Baik | Penyenggaraan berjadual | 1-5 |
| B | Baik | Penyenggaraan Condition Based | 6-10 |
| C | Sederhana | Pembaikan | 11-15 |
| D | Kritikal | Pemulihan | 16-20 |
| E | Sangat Kritikal | Penggantian | 21-25 |

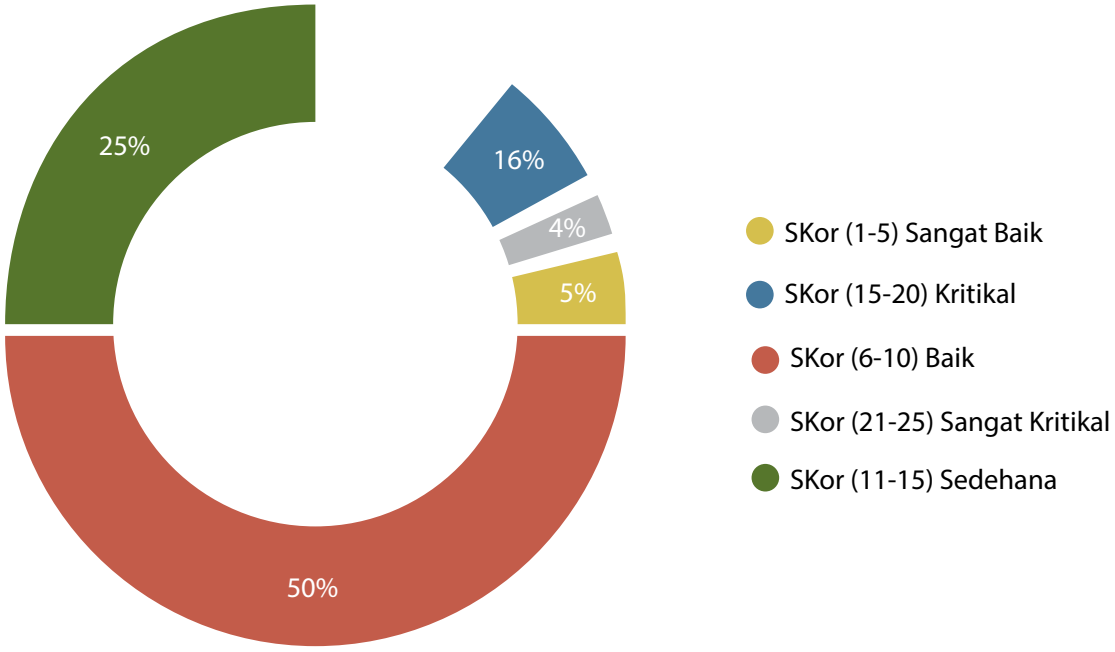
selepas kesemua kecacatan dan kerosakan bangunan dikira di dalam Jadual Keadaan Bangunan (JKB) / Schedule of Building Condition. Berdasarkan jadual ini, bangunan Stesen Komuter Klang dikategorikan sebagai Sederhana. Berikut adalah jadual rating keseluruhan bangunan yang dikeluarkan oleh JKR.

## 7.0 HASIL PENEMUAN PEMERIKSAAN

Penemuan kepada kerosakan atau kecacatan dinilai dengan menggunakan tahap keadaan bangunan yang ditetapkan di dalam Garis Panduan Pemeriksaan dan Penilaian Keadaan Bangunan (JKR 21602-0004-13). Skor Penarafan yang diperolehi adalah sebanyak 11.79 (sederhana) iaitu di antara skor 11 hingga 15. Penilaian dan hasil kajian adalah melalui pemerhatian (visual) dengan mengambilkira impak keadaan bangunan dari aspek keselamatan, kefungsian dan kebolehsenggaraan. Berikut adalah ringkasan taburan bilangan kecacatan dan kerosakan bangunan berpandukan skor 'rating' keseluruhan bangunan.

Berdasarkan Carta 1.1, taburan kecacatan bangunan Stesen Komuter Klang yang paling tinggi adalah 50% iaitu pada skor 6-10 iaitu berada di dalam kondisi baik diikuti oleh 25% iaitu skor 11-15 iaitu berada dalam kondisi sederhana. Berdasarkan pemerhatian ketika kajian dijalankan, kebanyakan kecacatan dan kerosakan bangunan yang dikategorikan mengikut skor 6-10 (baik) adalah kecacatan dan kerosakan pada elemen bangunan, elektrikal dan mekanikal seperti kotor, kotor dan usang, serangan serangga, cat tertanggal dan sebagainya. Kebanyakan kecacatan dan kerosakan yang berlaku dalam skor ini memerlukan pembaikan dan penggantian elemen dan komponen bangunan berdasarkan tahap keseriusan masalah tersebut. Bagi skor 11-15 (sederhana), berdasarkan pemerhatian ketika kajian dijalankan, kebanyakan masalah kecacatan dan kerosakan berlaku adalah seperti keretakan yang minor, elemen dan komponen bangunan yang ditumbuhi lumut, kelembapan bangunan, berkarat dan sebagainya. Bagi kecacatan dan kerosakan dalam skor ini, pemerhatian dan penggantian perlu dilakukan segera bagi mengembalikan fungsi sesuatu elemen dan komponen bangunan bergantung kepada tahap keseriusan masalah tersebut.

Walaubagaimanapun, pemerhatian mendapati, terdapat 4% kecacatan dan kerosakan bangunan berada dalam skor 21-25 iaitu pada tahap yang sangat kritikal. Walaupun dikategorikan sebagai skor yang paling rendah, pada tahap ini, pihak bertanggungjawab hendaklah mengambil perhatian serius disebabkan oleh kerosakan dan kecacatan elemen dan komponen bangunan ini boleh mendatangkan kecederaan serta kecelakaan dan perlu pembaikian dan penggantian yang segera dan sekiranya perlu hendaklah dirujuk kepada pemeriksaan pakar atau pihak yang bertauliah. Berdasarkan pemerhatian, kerosakan dan kecacatan bangunan yang dikategorikan dalam skor ini adalah yang melibatkan isu keselamatan pengguna bangunan seperti pemasangan kabel




**Carta 1.1:** Taburan kecacatan bangunan Stesen Komuter KlangR (2013)


**Foto 1.1:** 'Suspended ceiling' yang melendut dan pemasangan yang tidak mengikut spesifikasi serta keadaan siling yang kotor

elektrik yang tidak mengikut spesifikasi, pemadam api yang tamat tempoh penggunaan, struktur binaan yang tidak kukuh, keretakan yang major, siling melendut, soket pecah dan tidak berfungsi dan sebagainya.

Berikut merupakan antara hasil penemuan kecacatan dan kerosakan bangunan Stesen Komuter Klang mengikut elemen bangunan:

## 7.1 Awam/Struktur dan Kemasan

### 7.1.1 Bumbung Curam

Hasil pemeriksaan mendapati kebanyakan ruang bumbung curam (pitch roof) tidak dipasang dengan kelengkapan lapisan aluminium dan 'chicken netting' yang berkemungkinan menyebabkan kebocoran akibat daripada kegagalan bumbung pada bangunan Stesen Komuter ini.

### 7.1.2 Siling

Pemasangan siling gantung yang dibuat untuk bangunan ini tidak mematuhi spesifikasi pemasangan siling. Siling didapati melendut di kebanyakan lokasi. Hasil penemuan juga menunjukkan bahawa terdapat siling lama yang tidak dibuka sepenuhnya bagi pemasangan siling yang baru. Siling ini dikuatiri dari jenis asbestos dan perlu dilupuskan secara berjadual dan dengan cara yang betul. Didapati juga sarang anai-anai di bahagian atas siling yang menunjukkan kehadiran anai-anai pada kemasan dan kerangka siling.

### 7.1.3 Kerangka Bumbung

Didapati pada kerangka bumbung kayu pada bangunan Stesen Komuter Klang terdapat sarang anai-anai yang berkemungkinan kerangka kayu yang menyokong bumbung tersebut telah diserang anai-anai. Selain daripada itu, terdapat kerangka kayu yang telah patah dan keadaan terjuntai di dalam ruangan atas siling. Keadaan ini boleh menimbulkan bahaya kepada pengguna stesen.

Pada bahagian landasan kerangka besi yang dipasang didapati kebanyakkannya telah berkarat selain daripada bolt dan nut ada sebahagiannya telah tertanggal dan hilang.

### 7.1.4 Peralatan Sanitari

Peralatan Sanitari kebanyakannya kotor dan kelihatan usang. Selain daripada itu, hasil penemuan menunjukkan terdapat air yang bertakung di dalam sinki dan mangkuk tandas yang menunjukan bahawa berkemungkinan loji rawatan kumbahan tidak disenggara dan tidak berfungsi dengan baik.

### 7.1.5 Lantai

Didapati lantai telah usang dan kotor. Terdapat juga kemasan lantai yang telah pecah dan retak berkemungkinan daripada aktiviti penggunaan pengguna dan tiadanya kerja-kerja penyenggaraan secara berjadual dilaksanakan.

### 7.1.6 Tiang

Tiang didapati kotor dan usang. Terdapat juga keretakan lepaan pada tiang yang berkemungkinan disebabkan oleh perubahan, perbezaan suhu serta tindakan cuaca persekitaran. Selain daripada itu didapati ada tiang yang telah dipotong bagi tujuan pembinaan ramp untuk orang kurang upaya dan memudahkan pengangkutan barang-barang. Walau bagaimanapun keadaan ini boleh membahayakan memandangkan tiang ini merupakan struktur utama yang menanggung beban kekuda besi stesen ini.

**Foto 1.2: Kelengkapan sanitari yang using dan kotor**

**Foto 1.3: Lepaan lantai yang retak dan kemasan lantai yang usang berdasarkan kemungkinan tiada penyenggaraan berjadual**

**Foto 1.4: Keadaan struktur tiang yang berkarat dan usang serta keadaan tiang konkrit yang retak**

### 7.1.7 Dinding

Dinding didapati telah mengalami keretakan samada melintang dan juga menegak. Hasil penemuan menunjukkan bahawa panjang keretakan adalah sehingga 3.15m panjang dengan kelebaran antara 0.10mm hingga 0.15mm. Selain daripada itu, dinding juga telah mengalami pengelupasan cat yang teruk, kelembapan, kotor dan jugak usang.

### 7.1.8 Pintu

Pintu didapati sukar dibuka dan telah menyebabkan kebanyakkannya hampir rosak. Tombol juga didapati telah berkarat akibat dari tindakan cuaca persekitaran. Selain daripada itu door closer didapati patah dan berkarat. Keadaan yang berkarat ini telah menyebabkan elemen tersebut cepat patah.

### 7.1.9 Tingkap

Tingkap pada ruang cafetaria telah ditutup dengan kotak. Keadaan ini boleh menimbulkan bahaya jika berlaku kebakaran pada ruangan tersebut. Selain daripada itu tingkap juga didapati tidak dapat dibuka dan disenggara dan dibersihkan secara berjadual.

## 7.2 Elektrik

### 7.2.1 Sistem Pendawaian Elektrik

Sistem pendawaian elektrik secara keseluruhannya telah lama dan ada yang tidak diganti tetapi masih boleh berfungsi. Selain daripada itu didapati pepasangan elektrik yang dipasang

**Foto 1.5: Keadaan struktur dinding bangunan yang retak dan lembap serta keadaan cat menggelupas**

**Foto 1.6: Keadaan pintu yang sukar dibuka dan elemen pintu yang sudah using dan berkarat**

**Foto 1.7: Keadaan tingkap yang tidak berfungsi dan ditutupi oleh kotak mendatangkan risiko jika berlaku kebakaran dan keadaan elemn tingkap yang using dan berkarat**

**Foto 1.8: Keadaan system pendawaian elektrik yang lama dan tidak mengikut spesifikasi**

**Foto 1.8: Keadaan system pendawaian untuk penghawa dingin yang lama dan tidak diselenggara dengan baik**

tidak mengikut spesifikasi pemasangan yang betul. Keadaan ini tidak langsung menjejaskan sistem pendawaian elektrik pada bangunan ini.

### 7.3 Mekanikal

### 7.3.1 Sistem Mekanikal

Didapati unit penghawa dingin yang dipasang pada bangunan ini kebanyakkannya tidak dapat berfungsi dengan baik disebabkan keadaannya yang telah usang dan lama tanpa disenggara. Selain daripada itu unit-unit luar hawa dingin yang dipasang pada bangunan ini secara tidak langsung telah menjejaskan pandangan bahagian hadapan Bangunan Stesen Komuter. Salur penebat yang telah pecah dan dawai pengikat hawa dingin ada juga yang telah berkarat kerana terdedah dengan cuaca persekitaran.

## 8.0 CADANGAN

Berdasarkan kepada hasil pemeriksaan bangunan yang dijalankan, bangunan Stesen Komuter Klang ini mempunyai kecacatan dan kerosakan yang memerlukan pembaikian dan penambahbaikan secara efektif dan berkesan bagi mengelakkan kerosakan yang lebih serius berlaku jika tidak dipantau dengan sempurna. Berikut merupakan antara cadangan bagi memastikan kecacatan dan kerosakan bangunan dapat diminimakan:

### a) Pembaikan berdasarkan faktor keselamatan

embaikan atas faktor keselamatan memerlukan perancangan yang rapi dan disegerakan dalam memastikan faktor keselamatan dan kesihatan pengguna bangunan diutamakan.

### b) Pelupusan bahan buangan dan kitar semula hendaklah

### mengikut Akta 672 (Garis Panduan Sistem Pengurusan Sisa Pepejal)

Perancangan pembaikan dan penggantian terutamanya elemen dan komponen bangunan yang digantikan dan perlu dikitar semula dan dijual semula dan jika perlu hendaklah dilupuskan berpandukan kepada Akta 672.

### c) Penyenggaraan berjadual

Pembaikan berdasarkan penemuan hendaklah disegerakan terutama yang melibatkan operasi seharian bangunan stesen komuter ini. Sebagai contoh, penyenggaraan dari segi system penyamanan udara secara berjadual sekurang-kurangya membantu penghuni bangunan (kakitangan) dalam menyempurnakan tugas dengan lebih efisen dan sistematik. Oleh itu, penyenggaraan yang berjadual hendaklah dititikberatkan dalam usaha memastikan penyenggaraan yang lebih sistematik.

Selain itu, cadangan penambahbaikan ketika menjalankan kerja-kerja pemeriksaan bangunan secara bersama antara pihak JKR - UiTM (Perak) juga boleh dilakukan dalam usaha memastikan keberkesanan dalam pemeriksaan bangunan pada masa akan datang. Berikut adalah kerja penambahbaikan yang boleh dijalankan:

### a) Penambahan ahli pasukan dalam menjalankan kerja pemeriksaan

Berdasarkan pemerhatian ketika kajian dijalankan, cadangan penambahan ahli pasukan adalah perlu dalam memastikan pemeriksaan bangunan yang lebih sistematik.

### b) Pengemaskinian data secara terus

Berdasarkan kajian yang dijalankan, adalah dicadangkan agar pemeriksaan bangunan yang dijalankan ini mengemaskini data pemeriksaan bangunan secara terus sejurus selepas pemeriksaan yang dijalankan tamat pada hari tersebut. Ini adalah untuk memastikan ketulenan data dan penyimpanan data yang lebih sistematik dan komprehensif.

Stesen Komuter Klang Selangor ini masih berfungsi tetapi dalam keadaan yang Sederhana. Jika ianya tidak dipantau secara berterusan terutama kepada kecacatan / kerosakan bumbung, siling dan sistem elektrikal, perkara ini boleh menyebabkan penyampaian perkhidmatan Stesen Komuter Klang terjejas sama sekali

### c) Peletakan penyelia dalam setiap pasukan pemeriksaan

Berdasarkan pemerhatian, peletakan penyelia dari pasukan JKR adalah sangat diperlukan dalam setiap pasukan pemeriksaan bangunan yang dianggotai secara bersama oleh pihak UiTM (Perak). Ini adalah untuk memastikan ketulenan dari segi data yang diperoleh dan memastikan prosedur yang dijalankan adalah mengikut kepada standard daripada Bahagian Senggara dan Fasiliti Bangunan, JKR.

## 9.0 KESIMPULAN

Secara keseluruhannya keadaan bangunan Stesen Komuter Klang Selangor ini masih berfungsi tetapi dalam keadaan yang Sederhana. Jika ianya tidak dipantau secara berterusan terutama kepada kecacatan / kerosakan bumbung, siling dan sistem elektrikal, perkara ini boleh menyebabkan penyampaian perkhidmatan Stesen Komuter Klang terjejas sama sekali. Penemuan pemeriksaan mendapati bahawa keadaan bangunan stesen ini boleh terdedah kepada keadaan risiko yang berbahaya, kegagalan kepada pengoperasian dan keselesaan penggunaan bangunan serta boleh memendekkan jangka hayat bangunan.

Antara faktor-faktor lain yang menjadi penyumbang kepada kerosakan dan kecacatan bangunan Stesen Komuter Kelang Selangor adalah seperti berikut:

a) Tiada kerja-kerja penyenggaraan secara berjadual dijalankan tertama yang meliputi kerja-kerja pembersihan, sistem elektrik, sistem penyamanan udara dan sistem perpaipan.
b) Kerja-kerja penyenggaraan dijalankan secara pembaikan 'Ad-Hoc' dan tiada pernacangan kerja yang sistematik.
c) Kualiti dan mutu kerja-kerja pengubahsuaian bangunan tidak dilaksanakan mengikut spesifikasi yang telah ditetapkan disebakan tiada pemantauan oleh pihak yang bertanggungjawab.

## 10.0 RUJUKAN

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# Interview With Sr Hasan Jamil, President Session 2014/2015

## Brief background of President Sr Hasan Jamil

I was born on 29th June 1957 in Jementah, Segamat, Johor. My primary education is at Primary English School Segamat, Johor. My secondary education is at Sekolah Menengah Jementah, Segamat, Johor and Sekolah Menengah Teknik, Kuala Lumpur (also known as Technical Institute Kuala Lumpur at that time).

I joined Institut Teknologi Kebangsaan (later known as Universiti Teknologi Malaysia) in 1974 and graduated with a Bachelor Degree in Land Surveying in 1979. After working for several years, I continued my studies and graduated with MSc in Geographical Information System from University of Edinburgh, United Kingdom in 1993.

## Q. Why did you choose a career as a surveyor and how long have you been with the industry?

Land surveying is one of the subjects taught at Technical Institute Kuala Lumpur but little did I knew regarding the surveying profession as a whole at that time. After the Malaysia Certificate of Education results in 1974, I was accepted for the land surveying degree course at Institut Teknologi Kebangsaan (now known as Universiti Teknologi Malaysia) and graduated in 1979.

I was appointed as a land surveyor in the Department of Survey and Mapping Malaysia (JUPEM) on 12 April 1979. My first appointment was in Terengganu. That was the beginning of my career in the surveying industry. Apart from Terengganu, I have served in various capacities within JUPEM in Kelantan, Sabah, Penang, Selangor, Wilayah Persekutuan Kuala Lumpur/ Putrajaya and also at JUPEM Headquarters. My present designation is Deputy Director General I.

I joined RISM in 1980 and have served in various capacities within the Institution in the Sabah Branch, Penang Branch, Geomatics and Land Surveying Division and as Deputy President for 2013/2014.

## Q. What do you know about the early formation of RISM?

Prior to March 1961, there are two professional bodies representing surveyors, i.e. the Malayan Institution of Surveyors (former R.I.C.S. Federation of Malaya Branch) and the Institution of Land Surveyors. On 13 March 1961, these two bodies merged to form The Institution of Surveyors (Federation of Malaya). On June 1966, the name of the Institution was changed to The Institution of Surveyors, Malaysia. On 28 March 2011, the Institution was conferred the royal status by His Royal Highness the Sultan of Selangor.

At present RISM consists of four surveying disciplines, i.e. Geomatics and Land Surveying, Quantity Surveying, Property Management and Valuation Surveying and Building Surveying.

## Q. As the current President, what do you hope to achieve during your tenure?

The tenure of RISM's President is only for a year; therefore within this short period it is my sincere hope that RISM would be able to encourage more young surveyors to join the Institution as members by streamlining the admission procedures, without diluting its quality criteria both for local and international membership. This entails not only using modern technology, but requires that members seek to encourage eligible surveyors to join the Institution, to brief them on what membership means and explain why the strength and unity of our profession benefits all surveyors.

To achieve all or part of these, we need to have:

- An efficient and representative structure;
- An efficient and modern Secretariat; and
- Involvement of members in projects and activities.

## Q. In what areas do you feel that RISM can further improve on?

All the Divisions and Branches should continue to carry out the Continuing Professional Development (CPD) Programmes and Surveyors Social Responsibility (SSR) Programmes that will benefit the members and the society.

RISM should continue to be involved in the evaluation and standardisation of new surveying technologies, such as Building Information Modelling and Valuation Standards, enhancing new skills in geospatial data acquisition and processing, management of property and building maintenance. We should enhance the cooperation with the authorities, the various Surveying Regulatory Boards and other professional bodies.

## Q. How do you plan to improve the profile of RISM/surveyors?

RISM must continue to increasingly use advanced information and communication technologies and the RISM website should eventually become the preferred interface for members and public who seek information about RISM, conferences, technologies and surveying services.

## Q. With the many international and national surveying organisations, what do you consider the prime focus for RISM?

RISM must continue to preserve our core values and commitment to protect the public interest which is the cornerstone of our profession. Integrity, objectivity, professional competence and due care, confidentiality, and professional behaviour are central to instilling public trust. RISM should also play a role in the development of the country by providing professional inputs to the policy makers.

## Q. How would surveying firms remain relevant in this competitive market?

The services sector has been identified by the Government as the next engine of growth to elevate the country's economic standing. Global competitiveness has made it necessary to develop the standard of professional services in our country to the next level in order to penetrate the world market. Our key agenda is therefore to enhance the skills and knowledge of all RISM professionals to meet the challenges of globalisation and deregulation.

## Q. Are there any regulatory impediments to the industry and/or profession which you feel should be reviewed?

At present, the Building Surveying is the only profession within the arms of RISM that has not been legally regulated. All the other three professions i.e. Quantity Surveying, Land Surveying; and Property Management and Valuation Surveying are regulated under the respective Acts to govern the professional practices.

The fundamental role of Building Surveyor is to ensure that buildings are functionally safe and fits for its purposes. It must adhere to its design and consequently comply with all statutory requirements such as the building bye-laws and regulations. They contribute in improving standards and quality of buildings. It gives impact on the design, planning and construction of buildings by reducing defects, detects and diagnoses problems with design issues, construction techniques and materials. They manage building control process, inspects compliance to the approved building plans from foundations to completion.

A building control legislative scheme should be designed with the objective of ensuring that Building Surveyors act with a high degree of professionalism and integrity in order to protect the public. Building Surveyors should be mandated by legislation to exercise specific professional skills when they evaluate and assess plans and specifications. They are required to perform their work in a competent manner and to a professional standard.

For the other three surveying professions, RISM will work together with the respective Boards of Quantity Surveyors, Land Surveyors and Valuers to improve standards of services and professionalism.

## Q. Are there any messages that you would like to convey to your members?

In view of the challenges facing the profession, members must continue to uphold and maintain public trust and confidence. We should ensure our services and conduct must be rigorous to engender confidence among the parties that rely on information, including investors, regulators, financial institutions and government.

## Q. What is your advice to young Surveyors?

Young surveyors should get themselves involved in the activities of RISM. There are many committees and sub-committees that need involvement and contribution from young surveyors. From these involvements, they can gain invaluable experience that can develop them into future leaders.

The propects of the surveying industry is still bright even though the competition is stiff. My advice to young surveyors therefore is to dare dream of being successful but should not to be afraid to work hard, maintain a lifelong learning attitude and persevere. Be proud to be a member of RISM!

**Wan Hussin W.M.A.**
**PhD, MBA, BSc., Dip.LSurv, FRISM, MSP, MAALS**

Licensed Land Surveyor under Act 458 [Rev. 1991]
Malaysian Speaking Professional
Universiti Sains Malaysia

# How to enjoy a stress-less holiday?

It is the end of the year and many of us plan to have a holiday with our family members, be it a local destination or overseas, or feeling in need of a break somewhere for the hard work we all do the year round. This is also the time we set up our plans to start the New Year feeling ready for anything.

But more often, many spend the holiday season in a flurry of activity that leaves them feeling like they need a vacation from their holiday, or feeling as though they have lesser energy than before, less money, wasted time, regretting moments and even more unwanted weight than they would like than they had before the holiday season began.

## A holiday meant for a better new year

Most of us want to start the New Year poised to make some healthy and life-affirming changes. While we try to maintain what is working in our lives, we always want to improve better as we start the New Year feeling like we need to recover from the holidays. A holiday to end the year should be a reward for the hard work done for the whole year and to start the New Year with betterment and commitment.

## How to survive a holiday?

The holiday season is a time filled with happy and memorable moments with family members, and trying lots of new food. To enjoy a stress-free holiday, maintaining a healthy and nutritious diet can make us feel better and have more energy to enjoy the season. When we know the causes of emotional eating, we can easily prevent it.

The struggle to continue maintaining a healthy diet and staying fit is always a challenge for many of us. This is because, even if we know what we are supposed to be eating, there are additional factors that influence how much and what type of food we consume, and one of these factors is the holiday stress, which is linked to an increased emotional eating.

## Emotional eating

Emotional eating has many causes. While there are many reasons for emotional eating, and it is now a prevalent fixture in our society, it's not necessarily good for us while enjoying the holiday. If we now admit that we are one of them, it is now the time to accept the fact that it is an unhealthy attitude and start a new life by developing some effective stress management techniques and coping skills so that our body stays healthy and try to be choosy with our diet, rather than feeling out of control. So, start by being practical by understanding the true facts of emotional eating.

Emotional eating can bring on increased levels of cortisol, also known as "the stress hormone". Cortisol has a beneficial function in the body, but excessive levels of cortisol brought on by chronic stress can cause a slew of problems in the body

Emotional eating can bring on increased levels of cortisol, also known as "the stress hormone". Cortisol has a beneficial function in the body, but excessive levels of cortisol brought on by chronic stress can cause a slew of problems in the body. Among other things, high levels of cortisol can create cravings for salty and sweet foods.

When we are under stress, we normally seek out social support, which is a great way to relieve stress. But many may think that uncontrolled food intake can reduce stress. This may be termed as emotional eating, which can make us feel better in the short term, but we may regret later. Sometimes this leads to nail biting or teeth grinding, and often it leads to continuous eating when not hungry. Many people, out of nervousness or boredom, just munch on tidbits or drink soda to give their mouths something to do.

## How to survive the holiday?

The holiday season presents too many opportunities to overindulge in unhealthy fare. It is difficult to resist this special once-a-year feast food when everyone around you is indulging as well, and when happy memories are being created around the whole experience. Emotional eating is also common when the holiday season is stressful. Many people decide to take a break from watching what they eat, and just plan to get back to healthy habits in the New Year. Unfortunately, people can pack on extra weight in these few weeks that set them up to feel discouraged and even overwhelmed in the New Year. Sometimes this can lead to a resolution that is unrealistically challenging and often leads to failure or giving up before they even try it.

## Don't skip meals but control your diet

The old saying to "treat breakfast like a king" is always true after the long night break. Many people believe that if they skip breakfast or lunch, they can save up all of those calories for dinner. That sounds like an amazing idea, but skipping meals can make you crabby and tired and may lead to a headache that just might ruin your holiday. When you are really hungry and surrounded by high-calorie holiday treats, you may turn into a raving eating-machine and consume many more calories than the ones you skipped earlier in the day.

So, it is a test to challenge the situation, even during the holidays. For breakfast, try to eat a bowl of whole grain cereal with low-fat milk, followed by a mid-morning snack of dates, raisins and nuts and a healthy lunch with a big salad or a sandwich made with whole grain bread. Try to avoid rice. This can keep your body and your brain fueled throughout the day.

If a big dinner was planned for the night, try to have a snack on some fiber-filled

foods like low-calorie vegetables, a small salad, a piece of fresh fruit, or a small bowl of oatmeal which now comes in many flavors. Fiber helps you to feel full, and if you aren't feeling so hungry, you might not eat so much for the dinner. The rest of the dinner plate can be filled with healthy vegetables and fruits, whole grain crackers, fish and lean meats. It only takes a few minutes for your brain to realize your stomach is getting full.

Drink plenty of water. Many people believe that mild dehydration feels like hunger and the best way to avoid becoming dehydrated is to drink plenty of water. You can also use water to slow down your eating by taking a sip or two between bites.

True enough, it is difficult to avoid overeating during the holidays. You always want to try new things, especially when it looks and smells good. If you do slip up now and then, don't beat yourself up for it but rather be good to yourself. Remember that maintaining a healthy diet throughout the holidays takes practice. Try some new ways to make your holiday meals healthier. This can be as simple as serving steamed vegetables or fresh salads instead of casseroles or removing skin from the lamb. Just choosing fruit instead of a dessert can save hundreds of calories. Try to admit to yourself that small changes can add up to a big difference. What more if those small changes all start up during a holiday?

## Ways to avoid holiday weight gain

Holiday weight gain isn't inevitable and seems guaranteed, but the fact is, the holiday season doesn't mean your scale will become your worst enemy. Try to do things in moderation by keeping your serving sizes in check at all times and you really can enjoy your favorite holiday treats without gaining weight.

Stay active during the holidays and those extra pounds won't creep up on you. A 30-minute brisk walk most days of the week can do wonders for maintaining your waistline. Get outside if the weather permits or hit the mall before it opens for a workout while window-shopping.

Exercise habits can go by the wayside during the holiday season because we generally become busier with ground tours, gift-buying, and other responsibilities, while our regular responsibilities generally stay the same. When we become busy to the point of feeling overwhelmed, the gym can be one of the most common items to omit from our "to go" list. Don't be so quick to give up your workouts. Exercise, even in smaller doses can be a great source of stress relief. Maintaining regular workouts when busy, even if they are shortened, can make it easier to get back into a more robust fitness routine in the New Year. You can start the New Year off feeling like you are a step ahead if you maintain a modified fitness routine.

Try to admit to yourself that small changes can add up to a big difference. What more if those small changes all start up during a holiday?

## Get prepared and stay in control

Planning ahead for a good holiday can make all the difference. Use whatever means to get the necessary information and the various options available for anything. This could be the nearby park trails for walking or jogging, the available fitness facilities at the hotel, and the possible walking opportunities to those tourist spots. Getting ready with a good pair of walking shoes is a brilliant idea. To plan for these schedules well in advance is already a wise step to manage stress.

The most important thing is to be realistic and go easy on yourself. You aren't always in charge of your schedule during the holidays so you can only do your best and hope for the best. Accept the fact that you can get back to your routine when you're back home.

The trick to making it through the holidays without guilt is to stay in control. Be conscious of your eating and exercise choices. Everything you do is always a choice, and you are the one who makes it. So knowing the consequences of your decisions will help you enjoy the holiday season. As holidays are only an annual event, you may use this as an excuse to try and eat more for some reason. But if there is something that you wish to do, you may end up eating more and exercising less. Realizing that you will probably gain a little weight as you expect it, the readiness to deal with it when the holiday is over is already a battle half won.

## So, enjoy your holiday

The holiday season can be an amazing and memorable time of the year. It can leave you feeling overwhelmed for the year ahead. It is so effective to make a plan for the holiday that can give you a boost in energy and help you to end the year feeling empowered.

This can be a great way to relieve stress.

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

# Glodon Integrated Solution for Construction Project

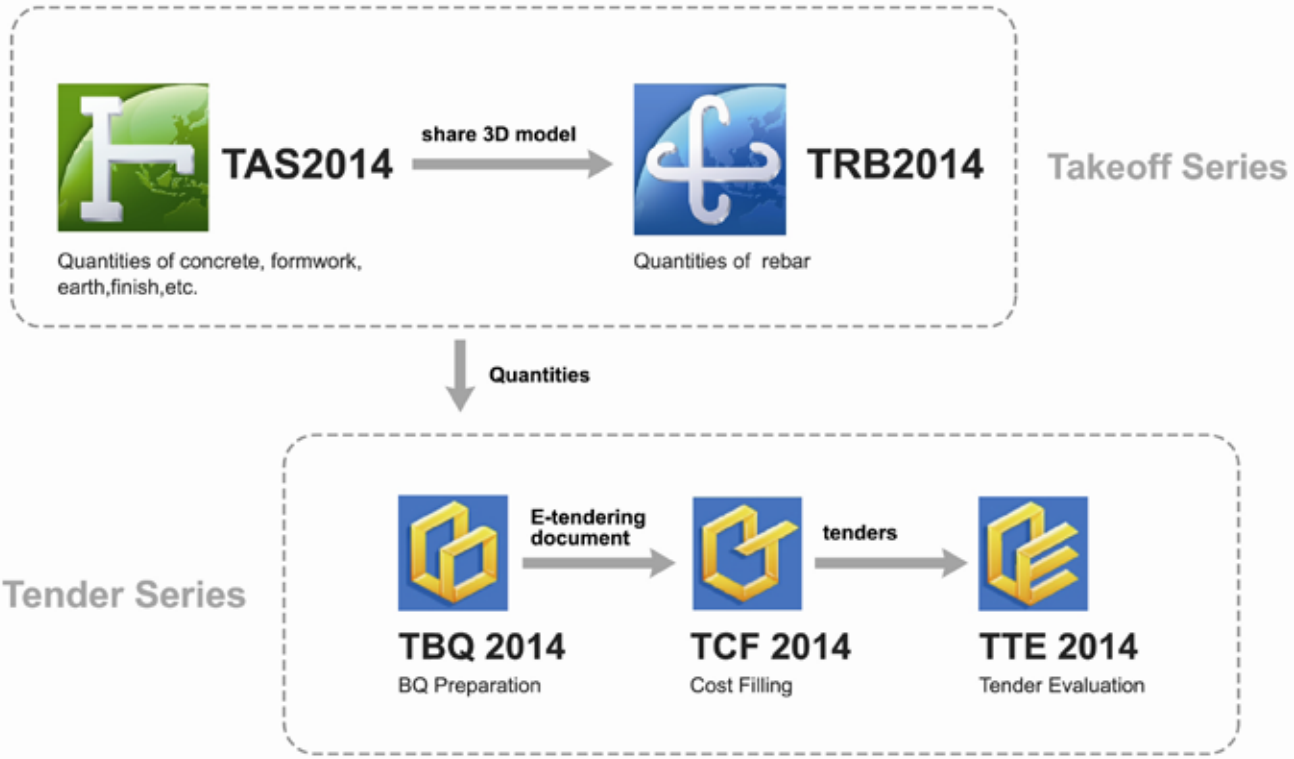
In the life cycle of construction,the core activities for QS are quantity take-off and cost estimate.To meet these needs, Glodon provides professional products and services.

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.


# Surveyors' Social Responsibility (SSR) Programme in the Cancer Paediatric Ward, Hospital Universiti Kebangsaan Malaysia (HUKM)

The Publicity and Promotion sub-committee proposed a SSR program to the Council at the last Session (2013/2014) to collaborate with Red Bubbles, a non-profit organisation that brings smiles and laughter to seriously ill children in hospitals and other healthcare settings through regular clowning visits. The project, comprising a mini library, murals and a monthly clowning visit for a year, was accepted by the General Council and subsequently a sum of RM26,000.00 was collected from the members.

The SSR Programme was then successfully organised and the Handing Over Ceremony of the Charity Project of Mini Library by RISM at Paediatric Ward 4D (Oncology & Haematology), UKM Medical Centre, Cheras, Kuala Lumpur was held on Wednesday, 10 September 2014.

PPUKM was represented by Encik Adli Muhammad, the Director of Operations who delivered a speech on behalf of the Dean of Medical Faulty & Director of PPUK, YBhg. Prof. Dato' Dr. Raymond Azman Ali.

RISM's delegation, led by the President, Sr Hasan Jamil and included Immediate Past President Sr

P. Tangga Peragasam, Past President Sr Dr Khoo Boo Kean and Organising Chair Prof Sr Dr Wan Maimun Wan Abdullah and several RISM members, visited the Mini Library, the Paediatric Ward and also distributed the goodie bags to the young patients. A few media recorded the event and interviewed the President and Past President regarding the project and RISM. It was broadcasted on TV Alhijrah.

The General Council and the Organising committee wished to thank all members who have contributed and making this charity project a success. Special appreciation goes to Red Bubbles and management and staff of UKM particularly the Paediatric Ward. Based on the success of this project, the Council agrees to continue with the SSR project at other hospitals.


# Technical and Study Tour to Central Asia– Kazakhstan and Kyrgyzstan From 13th to 20th September 2014

The Study Tour attracted 27 Members and 18 accompanying persons and it was led by the President, Sr Hasan Jamil. The 8 day study tour comprised visits to numerous places of interest which were technical, historical and cultural in nature.

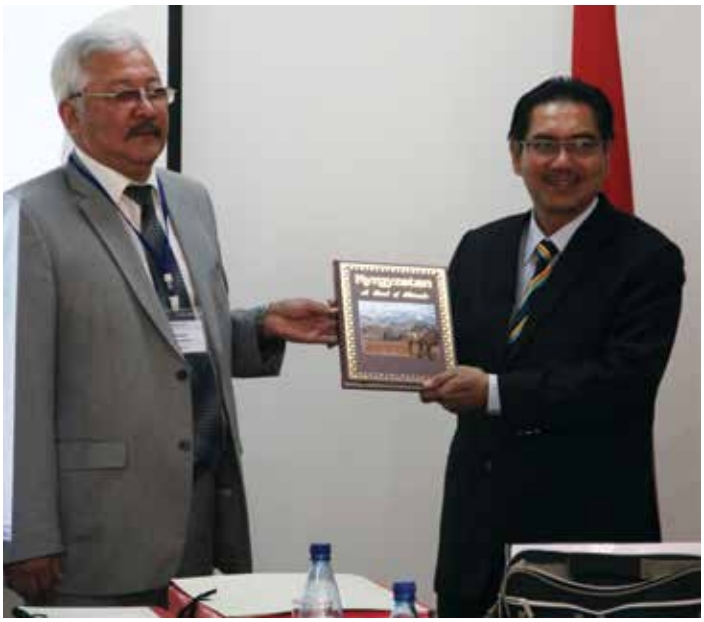
On 17th September 2014, a small delegation comprising mainly of the Geomatic & Land Surveyors and the Quantity Surveyors visited the State Enterprise – the State Design Institute of Land Management "Kyrgyzgiprozem" which was established by Decree of the Council of Ministers of the Kyrgyz SSR on 18th January 1964 and it is a public planning and surveying enterprise, based on the rights of economic jurisdiction, located in Bishkek, Kyrgyz Republic.

This Institute, with regional land surveying departments and the Republican soil-agrochemical station (RSAS) included in its structure forms a single administrative system of design and research enterprises of Land Management, offers various services on a contractual basis.

After the above visit, the delegation then continued with its technical visit to Kyrgyz State Service of Geodesy and Cartography which was founded in 1976. The activities of this organisation are regulated by the law of Geodesy and Cartography, regulations of Goskartography, and also a number of other laws and regulations.

The main functions of this organisation are:

- Supply geodetic, topographic and cartographic materials for national security, defence, industry, science, culture and education in the Kyrgyz Republic.
- Perform surveying, astronomy, gravity and topography works on the territory of the Kyrgyz Republic.
- Compilation and publication of maps and atlases for various purposes.
- Re-registration of maps and plans of a large-scale (1:10,000, 1:5,000, 1:2,000) in the new coordinate system Kyrg-06 of public use, accessible to all users regardless of ownership.

On 18th September 2014, the official delegation visited the Almaty City Administration, Land Relations Department, Division of Land Management, Kazakhstan.

Despite the hectic and tight schedules, the technical visits to the three departments were educational, enjoyable and rewarding. The delegation had also developed stronger bonds of fellowship amongst themselves within the fraternity and the counterparts while broadening one's perspective of the countries.

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*Lee Swee Siang and Rakan-Rakan*

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*SSC Survey Consultant*

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Mohd Safiuddin Mohd Salleh
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*Tiram Realty*

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CASIO


## CIVIL ENGINEERING

# SURVEYING CALCULATOR

**Shock-resistance*1, water-resistance, and dust-resistance*2 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)
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### 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. INTSEC1
16. INTSEC2 17. V-LINE 18. TRIANGLE 19. QUADRANG 20. HERON 21. STADIA


Shock-resistant

Water-resistant

Dust-resistant

USB

SD

## 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: 38 + 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.