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The Practice of Building Inspection from the Perspective of Building Management: A Preliminary Survey

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Abstract: Building condition assessment is a fundamental activity in building management during building's life cycle. Building condition can be assessed by performing building inspection to gather all the information and data needed. Therefore, it is important for building management team to master the building inspection work in order to get the accurate data to perform an effective building maintenance. This study seek to reveal the practice of building inspection from the perspective of building management team. The method used for data collection was through questionnaire survey that involved 27 participants. All the participants were involved in managing building with experience between 10-20 years. Participants were asked to response about the need of building inspection, their preferences of performing building inspection and their familiarity with building inspection standards or protocols. The data obtained were analyzed using SPSS Software to get the mean scores. The result indicates that all respondents were aware about the need of building inspection under some circumstances. However, they do not have good knowledge in building inspections works. Furthermore, the result show that the majority of respondents were unfamiliar with building inspection standards or protocols.

Key words: Building inspection, building defects, building maintenance, building management, preliminary survey, unfamiliar

INTRODUCTION

The quality of life in built environment is closely related to asset performance (Evans *et al*., 2001; Newcombe *et al*., 2005). Proper building maintenance could assure a good health and safety of building users (Reese, 2004; Hui, 2005; Ho *et al*., 2006). Therefore, building should be maintained with a good practice and an effective maintenance work depends on the accurate data provided. Therefore, before any maintenance work take place, building inspection works need to be conducted to provide the updated and accurate data as the reference to maintenance works.

Building inspection works is the best method to collect and analysed building current condition. Therefore, parties involved in this process should be proficient on the task in order to obtain the accurate result. Failed in building inspection works may cause inefficient maintenance works. Thus, this study seeks to reveals the understanding of Malaysian asset management personnel about building inspection practice by the preliminary survey.

Literature review: Yau (2011) asserted that building performance will decrease from time to time, if not properly maintained. However, proper building management that include building inspection and maintenance will provide a comfortable living environment to the residents in the long term (Ho *et al*., 2006). Proper building management not only provide better health but have a positive impact on economic aspects (Lair, 2003; Wei, 2003) and in line with sustainability (Yau, 2011). Contrary, improper building management work may cause accidents and harm the users (Raouf, 2004).

Building inspection is the key activity in building management. Building inspection is one of sub-activities in building condition assessment. Building condition assessment is the activity to determine the priorities for

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maintenance planning process (Rohayah, 2010). Management activities such as planning, execute, control and upgrade the maintenance process is difficult to conduct without building condition assessment (Parida and Chattopadhyay, 2007).

Abdul-Rahman (1996) stated that education and training in the management of asset quality are important. This is because the proper asset management is a key to achieving quality in construction (Chan *et al*., 2006) as well as post-construction. Therefore, building management team should be fluent in all building management process, especially, building condition assessment.

MATERIALS AND METHODS

The method of data collection was through questionnaire survey that involved 27 participants. The respondents are participants of building maintenance seminar held in October 2014 located in Ipoh, Perak. Respondents were required to fill up the form during the seminar. All the respondents were involved in managing health care building with experience between 10-20 years.

The questionnaire questioned about respondents agreement on the need of building inspection, preference of performing building inspection and their familiarity with building inspection standards or protocols. The collected data were key-in into SPSS Software for further analysis process. From the software, the mean score of each question were obtained. The result presented in table form and explained descriptively.

RESULTS AND DISCUSSION

The need of building inspection: Building inspection is an important practice in building management process that will indicate the condition of the buildings. Moreover, this practice is necessary to gather information on a building for management purposes. Thus, there is a need to conduct building inspection under certain circumstances. Table 1 shows respondents, agreement on the need of building inspection.

Result presented in Table 1 shows that all situation obtained means score which indicate that the respondents agree on the need of building inspection to be conducted. The highest score obtained by the need of building inspection before the issuance of Certificate of Practical Completion (CPC) with mean score of 4.33. Meanwhile, the need of building inspection to be done periodically once in 2 years obtained the lowest agreement and the respondents more prefer to conduct building inspection once a year. This result indicate that most of the respondents were aware about the important of building inspection under certain circumstances.

Table 1: Respondent's agreement on the need of building inspection

Situations	Mean scores	Average agreements
Before purchasing the property	4.00	Agree
Before completing of building	4.15	Agree
After (just) completion of building	4.26	Agree
Before the issuance of Certificate of Practical Completion (CPC)	4.33	Agree
Done periodically (once a year)	4.11	Agree
Done periodically (once in 2 years)	3.85	Agree

Preference of performing building inspection: Performing building inspection must be done is the best way to obtained the best result apart from minimizing the manpower, time and cost. The best way or options need to be determined based on theories and actual experiences on field. This study will discuss respondent's preferences of performing building inspection under following methods/approaches/circumstances. Table 2 shows respondent's preference on performing building inspection.

Overall, respondents were preferred with the presence of owner/occupier during inspection works. The presence of owner/occupier during inspection is good to assist building surveyors to understand the real condition of the building. The owner/occupier has a better understanding of the situation that exists in a building and knows about the history of the building. They are able to give additional information such as causes of defects, the frequencies of defects, the impact of building defects and others. The additional information is very useful to determine the level of defects (condition) and the priority.

Preliminary inspection aims to survey site's environmental conditions before starting building inspection. During preliminary inspection, building surveyor able to identified any potential hazards, condition of weather, work limitations and other aspects related to the site. The information is very useful in planning the inspection works. The result shows that the respondents were preferred to conduct preliminary inspection once arrived at site.

Based on Table 2, respondents were more preferred to perform building inspection work from 'external to internal' compare to 'internal to external'. In theory, building inspection need to be done from external to internal area. The advantage of this technique is building surveyor able to predict internal building defect based on external defect. For example, moisture problem on external wall may trigger another defect on the internal wall at the

Table 2: Respondent's preference on performing building inspection

Methods/approaches/circumstances	Mean scores	Preferences
The presence of owner/occupier during inspection	4.15	Prefer
Preliminary inspection once arrived at site	3.96	Prefer
External to internal	4.00	Prefer
Internal to external	3.85	Prefer
Start at top and working down (top down)	3.93	Prefer
Start at bottom and working up (bottom up)	3.56	Prefer
Start at roof space	3.56	Prefer
Defect recording by long hand (free flow writing)	3.44	Quite prefer
Defect recording by tape recorder	3.07	Quite prefer
Defect recording by site-prepared sketches	3.63	Prefer
Defect recording by pre-printed form/checklist	4.11	Prefer
Defect recording by on-site computer	3.70	Prefer
Defect recording by hand-held device (PDA, Smart phone, Tablet, etc.)	3.70	Prefer

same spot. Building defect usually occur on the external area before spreading into internal area because most of building defect factors came from outside.

In term building levels, respondents were more preferred to perform building inspection 'start at top and working down' compare to 'start at bottom and working up' and 'start at roof space'. Proper building inspection works should be started at the top and working down. This is because the defects at the upper level may trigger other defects on the lower level. For example, defects on upper level floor (such as moisture) may affect the ceiling at below level. Therefore, when the surveyors detect such defects on the upper level, they are able to predict or aware about defect that may occur at the below level (at the same spot). However, the best point to start building is at the roof top but must consider some factors such as accessibility and safety.

In terms of defects recording technique, there are six techniques listed in the table. Based on mean score, the most preferred technique selected by respondent's is defect recording by pre-printed form/checklist. Then, defect recording both by on-site computer and hand-held device at the second place. The lowest mean score obtained by defect recording by tape recorder and by long hand method. Both techniques that obtained lowest score were at preference level of 'Quite Prefer' while other four methods were at 'Prefer'. The result indicated that the respondents more prefer to the well-prepared method, especially, by pre-printed form/checklist. Besides, they also prefer to use equipment in line with the latest technology such as on-site computer and hand-held devices.

Familiarity with building inspection standard/protocol: Building inspection standards or protocols are very important because these document is a guideline for building assessment works. These document usually highlight the method of inspection and analysis processes. There are many standard/protocol developed worldwide and locally. Besides, there are some standard that developed for general uses and some standard were developed for a special use. The selection of standard for building inspection is depend on the purposes of inspection and type of building. Therefore, building surveyor/inspection should have a knowledge about all these standard to conduct a proper building inspection works. Thus, this research studied on the familiarity of respondents with listed building inspection standards/ protocols. Table 3 shows respondent's familiarity with building inspection standards/protocols.

Table 3: Respondent's familiarity with building inspection standards/protocols

Standards/protocols	Mean scores	Familiarities
RICS Building Survey Report (2005)	2.19	Not familiar
BRE Design Quality Manual (2007)	2.11	Not familiar
ASTM E-2018 (2008)	1.93	Not familiar
RICS Home Buyer Report (2009)	2.00	Not familiar
Condition Survey Protocol (CSP) 1 Matrix (2010)	2.22	Not familiar
RICS Condition Report (2010)	2.07	Not familiar
RISM Code of Practice for Building Inspection (CPBS101) (2011)	2.30	Not familiar
BCA JKR: Garis Panduan Pemeriksaan and Penilaian Keadaan Bangunan (GPPPB) (2013)	2.63	Quite familiar

Table 3 listed 8 standards/protocols for building inspection work that consist of 3 local standards and 5 international standards. Local standards listed in the table are Condition Survey Protocol (CSP) 1 matrix, RISM Code of Practice for Building Inspection (CPBS101) and BCA JKR. Based on mean score in Table 3, overall result show that most of respondents were not familiar with all these standards with the highest score obtained by BCA JKR (2.63). However, this highest score is between 2-3 which indicated that the level of familiarity is between not familiar and quite familiar but more likely to quite familiar. The lowest score obtained by ASTM E-2018 with 1.9259 while other standards obtained score which indicated that most of respondents were not familiar with all these standards. This result indicate that the respondents have a minimal knowledge about proper building inspection standards.

CONCLUSION

Building inspection is a key activity in determining building condition. Information obtained from building inspection work are very valuable in order to plan, execute, control and upgrade building maintenance. Therefore, it is important for building management team to be fluent in this activities and it is essential for them to master building condition assessment standards or protocols (at least some of the standards).

The survey found that the majority of respondents were aware that building inspection need to be conducted in particular circumstances. This is important to assess building condition before go to the next level. In term of practicing building inspection, the respondents give mix response between the bad and good practice. It show that some of them have a lack of knowledge on performing building inspection. However, they were preferred to use modern equipment in handling the works. Meanwhile, majority of respondents does not familiar with building inspection standards or protocols that have been put into listing in the survey form. This is a disappointing result as most of the respondents participated in this study are senior management team that have more than 10 year's working experiences.

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