

## CHAPTER 7

### CONCLUSION AND RECOMMENDATION

#### 7.1 Conclusion

There are some well-known building quality assessments to evaluate the construction project and each assessment are practicing with their own evaluates aspect. They derive the score is based on a systematic testing that involves mechanical and electrical, structural, architectural, random testing carried out by different team throughout the construction period.

After taken vacant possession from the developer, normally the owners of the property would launch the building defects to the developer, and the contractor would rectify the defects for the owner. However, the expectation on the defects between the developer and the property buyer is not the same. Therefore, there is a need of a guidelines for everyone to refer and stated the limitation to the standard of building quality.

Quality in building construction is not easy to define. Quality may mean different meaning to different people or different purposes. The product can be the whole building, a part of a building or just a component of a building. Therefore, a quality product of building construction is one that optimum cost and time meets of all contractual requirements.

The quality of the completed works is controlled by method of materials on site are judges by random sampling and testing, and a thorough inspection of the finished works is performed without exception before final acceptance. For quality assurance practice, an organization need to establish and maintain a quality management system usually abbreviated to quality system in its daily operation.

A framework for quality management is a quality system which to maintain consistent product quality. The organization carry out the production must have same means to ensure that every time a process is performed the same control is exercised and the same method is exercised. Quality system standard is a reference base is required against which the adequacy of a quality system can be judged.

During construction, inspection and testing should be progressively carried out to ensure that any defect is not rectified. Corrective and preventive action should be implemented by the authorized person (s) following an established procedure.

There were several of causes of building defects. For the primary causes, it can be categorize as design deficiencies, construction faults, lack of maintenance, change of use building and vandalism. Weathering agents such as solar radiation, wind, driving rain and atmospheric gases are also caused of the building defects occurrence. The chemical agents would also attack the building can cause building defects by corrosion, sulphates attack, crystallisation of salts and biological agents. There are also mechanical agents would also cause the defects on a building.

Building diagnosis involves in relevant experts investigate the building process existing condition, evaluate the data collected, carry out the necessary test, make professional recommendations, and foresee the future performance of the building. We need building diagnosis when the building persistent defects, aging structure, change of use or rehabilitation, sale of property, budgeting maintenance costs, post-crisis assessment and satisfying statutory requirements.

Normally building diagnosis would be carried out with the preliminaries, visual inspection, testing and monitoring and exploratory works. It may need the basic equipment and specialized equipment, which depends to the needs of the building surveyor. After gaining the information from the relevant sources, the building surveyor would need to prepare a written report with their opinion and recommendation.

During the handing over of vacant possession period, normally the finishes and decorations of the building would be investigated. All of the building elements: floor, wall, ceiling, doors, windows, sanitary fittings, M&E and so on; have the possibility of defects occurrences. Therefore, we may need the relevant guideline to help us in this process.

To achieve the research objective No. 1, three (3) Building Quality Assessments (BQA) have been selected and studied. The case studies have also been selected and inspected with referring to the BQA

From the research, we get to know that there was a lot of Building Quality Assessments (BQA) in building construction field. In Malaysia, there were only few BQA are practicing in the building industry. The Construction Quality Assessment System (CONQUAS) was developed by the Building and Construction Authority (BCA) in conjunction with the major public sector agencies and the various leading industry professional bodies to measure the quality level achieved in a completed project.

QLASSIS, the Malaysia Construction Industry Standards (CIS), was developed in year 2006, as a quality assessment system for building construction work standard by the technical committee on Quality Assessment in Construction with the assistance of Construction Industry Development Board Malaysia (CIDB) which acted as moderator and facilitator for the technical committee throughout the development process of this standard.

Hong Kong Housing Authority have developed the Performance Assessment Scoring System (PASS) and the Maintenance Assessment Scoring System (MASS) respectively, to maintain the standard of works for maintenance projects and new building works projects. However, this may not be introduced to Malaysia and we were not so familiar with these assessments.

To achieve the research objective No. 2, questionnaires had been distributed to the occupants of the case studies. From the feedback of the occupants, it could be understand

that the most of complaints by the occupants of the properties on the building defects and the efficient rectification works during vacant possession handover process. This could highlight to the occupants that the elements and defects to be noted during the handing over vacant possession inspection in order to direct the scope of the handover checklist design.

During the handing over of vacant possession period, there were a lot of defects on the building elements which would be commented by the owners. From the research, most of the purchasers claimed that there were rusty ironmongery for the doors, windows, cabinets' handles and some of the accessories in the unit.

There were also complaints that the ceiling soffit evenness of the unit. They concern that when installation of lights or lamps on the ceiling, the reflection of the light on the ceiling with uneven soffit, the ceiling would become wavy and it would create another esthetic issue. There were also complaints to the defective of sanitary fitting, unevenness of wall surfaces and chipped floor or wall tiles in the unit.

After handing over the vacant possession, the owners of the property may encounter other defects. The building elements which were always facing problem or defects by house owner were sanitary fittings, Ironmongery, piping, wall plastering and M&E fittings.

Most of the developer or contractor would rectify the building defects which were complaint by the owners. Most of the defects would be rectified less than one week. However, there were also some "subjective defects" which would be alleged by the

property owner. To remain the good impression and good name of the property company, normally the developer and contractor may carry out the “additional works” to suit the owners’ favour. However, it doesn’t mean that the owners were in the right position.

After the completion of a building, it has to meet various requirements, withstand the changes of weather. It is expected with minimal maintenance to withstand for many years. It is common that building defects and failure frequently occur. Every stage of the building process; consideration must be provided, of ways of reducing the occurrence of building defects and maintain the durability of the building.

In Malaysia, most of the property owners were more familiar with Construction Quality Assessment System (CONQUAS) rather than Quality Assessment System for Building Construction work (QLASSIC) and Building Performance Assessment (PASS). This is because CONQUAS had been practicing and used in Malaysia for longer period. It was also be introduced by the local property company to the property buyer as an additional marks to encourage they purchase the property.

Building Quality Assessment (BQA) is important to building construction industry. In the property buyer view, BQA is a benchmark to ensure the standard and quality of the property. BQA is representing the property buyer, especially the “layman” property buyers to ensure the purchased property in good condition and they do not need to worry about the quality aspect of the property.

BQA is also a guideline or reference for developer or contractor to follow and to ensure that the building quality is up to the standard and achieve the minimum requirements or within the tolerant. Although many latent defects are captured in the building quality standards, Building Quality Assessment is still found to be unable to detect latent defects. The main cause of this is due to the time which building inspection is carried out during the construction stage while latent defect only emerge at the occupancy stage

## 7.2 Recommendation

From the research, we know that every property owner would come across the process of handing over of vacant possession after the completion of the project. Therefore all of the owners should have a guideline or checklist as their reference during their handing over process. To achieve the research objective No. 3, herewith recommendation of the building quality survey procedure for the property owners.

1. The property owner should prepare a layout plan to their own unit. The layout plan could be copied from the Sale and Purchase Agreement. The layout plan could let the owner understand the orientation of the units. Besides that, the owner could also mark out all the detected defects on the layout plan as reference.
2. The inspection should be carried out by location basis, such as Living Room, Master Bedroom, Kitchen, and Common Bathroom. The owner could start the survey or inspection from the Main Entrance Door.
3. When come to a location, the survey could be start from the main building elements which is floor, wall and ceiling. When walk along these building elements, the surveyor should follow clock wise and carry out the inspection by visualization. If need, tapping and touching need to be done to ensure there were no hollowness on the building elements.



4. While the defects were detected, mark on the layout plan the location where you detected the defects and record down the defects type and the building elements. For example: Two (2) fine cracks on the wall and chipped floor tile. Photographs of the defects could be captured if necessary for record purpose. The photographs could be compared after the rectification work done.
5. The owner should test or turn on all the sanitary fittings and M&E equipment to ensure that all of the fittings and equipment are functioning well. Normally there were no lamp would be installed in the unit. Therefore the owner could bring along the torchlight to inspect the darker areas such as storeroom or bedroom.
6. The owner could give a copy of the layout plan to the developer or contractor and keep one copy for reference in the future. After the rectification, the developer or contractor would request for another inspection for the defect rectification works. Therefore, the owner could refer the previous record to inspect the work done.
7. If there are some defects which the owner could not identify or confirm, they can refer to the building quality assessments as their guideline for the minimum requirement and tolerant.

The proposed Building Handover Inspection Checklist (HOIC) could be referred at the Appendix.

Based on the research, the existing Building Quality Assessments (BQA) such as CONQUAS and QLASSIC are well organized and complied, especially QLASSIC, which had included more sections and elements than CONQUAS. However, we are of the view that there were some parts of the BQA are too general and no specific defects can be refer to a certain building elements.

For example if there is a scratch on the timber door, there is no “scratch” defect state in the BQA. Therefore we could only group the scratch defect into the item “No. stain marks and any visible damage” which is too general. Therefore we recommend that the BQA should include all the possible Building Elements and Building Defects into the guidelines.

Besides that, the existing BQAs would only be used by the person who is practicing in the building construction industry and only the relevant person would more understand the BQA. Therefore, we recommend that to produce a simple BQA which can be used by a “layman”, especially the property owners, to understand and use the guidelines as their references.