The viewpoint of developers background of study construction essay

Nowadays, building quality has been one of the important factors to satisfy customers. The priority of the customer is mainly based on quality rather than cost. In today's economy competition, it is getting more fierce and cruel than before. Products with good quality can attact buyers to purchase, therefore the pressure has been formed from customers leads the developers to provide the building product with excellence quality (Connections Magazine 2003). Connie (2001) acknowledges that facilities, exterior and interior design are included in building quality.

Due to the inconsistency in construction quality, the naissance of Construction Quality Assessment System or CONQUAS by the Construction Industry Development Board Singapore (now known as the Building and Construction Authority (BCA)), in conjunction with major public agencies and some leading industry professional bodies and organisations, had been designed to measure the construction quality level in construction industry in year 1988 (The National House Buyer Association 2008a). The CONQUAS has been evolved in seventh edition which renamed as CONQUAS 21.

Although having the different name, but still, QLASSIC aka Construction Industry Standard (CIS: 7) serves the same objectives as CONQUAS 21. Quality Assessment System in Construction or QLASSIC was developed by Construction Industry Development Board (CIDB) Malaysia together with various professional bodies, association, universities and government agencies to resolve the inconsistency construction quality. It is designed to standardise the quality standards in construction, to evaluate the performance of the construction, to have a proper standard of assessment system as well as to collect data for statistical analysis to continually

improve quality of construction (The National House Buyer Association 2008a). In other words, QLASSIC can be served as a quality yard stick for the construction industry and is able to let outsiders to compare relatively and quantitatively the quality of workmanship between construction projects.

Furthermore, some developers can set a CONQUAS score as a target for contractor to achieve (Building and Construction Authority 2008). Once the contractor has reached the targeted score, he will be awarded, but if the contractor is below the base line, he will be penalised. This will encourage the contractor to provide a superior building product.

Both CONQUAS 21 and QLASSIC are an independent assessment which is conducted by inspectors from BCA Singopore or CIDB Malaysia. Sample of building will be selected randomly and inspected to represent the quality of overall project, means that the inspection will not evaluate and measure every single unit in the project (The National House Buyer Association 2008a).

Problem Statement

Recently, people are more concerned about quality achieved in building project. So, many people will hesitate whether the property is up to the standard and worth to purchase with the amount of money that they pay (The National House Buyer Association 2008a)? Building project with high quality can ensure future marketability and enhances the clients' confidence to the building (Building and Construction Authority 2008). Therefore, developers should deliver the final building product with high quality standard to the purchasers.

Quality is always being emphasized in a construction project, the establishment of CONQUAS 21 or QLASSIC is an additional assurance for the developers to ensure the quality of the workmanship in the project is infallible. Moreover, the result of the assessment can present impartially the overall quality of the completed project as well as represent the performance of the building by the developer and the contractor. Furthermore, the higher score of the building can give a great sense of confidence to the house buyers to purchase the houses.

However, some developers in Malaysia are adopting either CONQUAS 21 or QLASSIC to ensure the quality of the product. There is no study being conducted regarding the preference of application of these two assessment methods. Therefore, a study on preference of application between CONQUAS 21 and QLASSIC will be proposed to find out the preference of developers. At the meantime, the researcher also wants to compare the application between CONQUAS 21 and QLASSIC and to determine the advantages of applying CONQUAS or QLASSIC. Finally, the researcher also wants to find out the constraints when implementing CONQUAS 21 or QLASSIC.

Project aim and objectives

Aim

The aim of this research is to study the preference of application between CONQUAS 21 and QLASSIC from the viewpoint of developers

Objectives

In order to achieve the aim mentioned above, several objectives are created.

To compare the application of CONQUAS 21 and QLASSIC;

To determine the advantages of applying CONQUAS 21 and QLASSIC in construction projects;

To examine the problems or constraints when implementing CONQUAS 21 and QLASSIC in construction projects;

To find out the preference of developers in the application of CONQUAS 21 and QLASSIC and the reasons.

Key Questions

The following key questions are formed in order to achieve the objectives:

What are the differences between application of CONQUAS 21 and QLASSIC?

What are the advantages of applying CONQUAS 21 or QLASSIC?

What are the constrains or problems to be faced when implementing CONQUAS 21 or QLASSIC?

Which type of construction quality assessment system is more preferred among Malaysian developers?

Importance and benefits of study

This study is to find out the preference of developers on application of CONQUAS 21 and QLASSIC. This can gather the opinions from developers in order to determine which construction quality assessment system is more preferred among Malaysian developers. Besides, this study also can increase

the level of awareness for the Malaysian developers who do not apply either CONQUAS 21 or QLASSIC.

Other than that, the research also focuses on the advantages and constraints in applying CONQUAS 21 and QLASSIC. The benefits of this study provide better understanding to the developers about the advantages when applying CONQUAS 21 or QLASSIC and encourage them to apply either system for further improvement in the quality aspects of construction projects. Besides, this study highlights the constraints when implementing CONQUAS 21 and QLASSIC so that developers are aware of these issues and able to avoid or mitigate them for effective application of the aforesaid construction quality system in their construction projects.

Scope of study

To achieve the objectives mentioned, this study will just focus on two construction quality assessment systems, namely, CONQUAS 21 and QLASSIC. This research does not include other construction quality assessment system such as European Association for Quality Assurance (ENQA), Project Quality Performance in Hong Kong developed by Chan (2001) and Blueprint in United States developed by the Quality Performance Measurement Task Force (QPMTF) of Construction Industry Institute (CII) (Stevens 1996).

Additionally, the researcher will conduct an in-depth study on the advantages and constraints of applying CONQUAS 21 or QLASSIC. The researcher will also cover the preferences of application between CONQUAS 21 and QLASSIC from the viewpoint of developers. Data collection will be

done by conducting a structured interview among developers in Malaysia to ascertain the advantages and constraints of applying CONQUAS 21 and QLASSIC and to find out the preferences of developers in the application of CONQUAS 21 and QLASSIC and the reason.

Due to time constraint, the structure interview will be conducted on developers, which are registered under Construction Industry Developer Board (CIDB) within Selangor and Kuala Lumpur area only. Thus, the contractors as well as developers from other states will not be considered for this study.

Methodology

In order to achieve the objectives of this study, there are two methods to be used to collect data, they are respectively the primary data sources and secondary sources.

Primary Data Sources

The second, third and fourth objectives, which are determining the advantages of applying CONQUAS 21 or QLASSIC, problem or constrains when implementing CONQUAS 21 or QLASSIC and preference of the developer in application of CONQUAS 21 and QLASSIC and the reasons, can be obtained by conducting structured interview. Structure interview will be conducted with developers who adopted both CONQUAS 21 and QLASSIC in the previous or current projects. The interview mentioned will be conducted within Selangor and Kuala Lumpur area.

Secondary Data Sources

Literature review is an essential material for researchers to enhance basic knowledge regarding to the research topic. Journal articles, government articles, newspapers, journals, books, magazines and internal research are used in secondary data sources. The review from those sources would complement the information for the first, second and third objective, which are compare the differences between application of CONQUAS 21 and QLASSIC, advantages and constrains of applying CONQUAS 21 or QLASSIC. Besides, information can also be obtained from library at TARC, National Library and the resources centre of CIDB.

Figure 1. Outline of research proposal

– Literature Review

Quality Philosophy

Definition of Quality

The word of " quality" has a wide definition and it is an elusive concept, because different people view it differently (Joel E. Ross 2009). It can be further proven by Kerzner's (2009, p. 875) study, he indicated that quality cannot be defined accurately, the major reason for quality depends on the view of the customer. Quality is always treated as a complicated term, the explanation is inadequate to help a quality professional fully understand the concept. However, quality experts define quality in a different way as well, which is based on the customer's perspective, speciafication-based prespective (Assignment Expert n. d.).

However, there is a modern definition derived by Prof. R. K. Gupta (2008) that quality is " fitness for intended use". It can be explained as " meeting or

exceeding customer expectations". It can be further defined as the " degree of fulfillment of customer needs and expectations" by a supplier or service provider. Undoubtedly, quality is an essential element in a series of activities that has been preceived and value much by end users, not the suppliers.

There are seven essentials of measuring quality, they are " Functions", " Safety", " Aesthetics", " Reliability", " Longevity (product lift and maintenance)", " Service-delivery (effectiveness of marketing channel)" and customer communication (effectiveness of communication channel)". Those are the main elements to cover customers' satisfaction and developers' preception about quality of product (Prof. R. K. Gupta 2008).

David's study (cited in Joel E. Ross 2009) stated that quality can be summarised into five principal approaches, which are transcendentel view of quality, product-based view, user-based view, manufacturing-based view, and value-based view. The explanation of each view is shown as below:

Transcendental view of quality – cannot be defined, but it can be differentiated by looking product. For instance, advertisement.

Product-based view – quality is deemed as quantifiable and measurable characteristics. For instance, measure product's durability or reliability (e. g. mean time of failure or finish) and design the product to the benchmark. Although this approach has a lot of benefit, but it has restriction as well. In fact, quality is mostly based on individual taste or preference, therefore the benchmark for measuring may be misleading.

User-based view – products that meet customers' preferences are esteemed as highest quality. This may lead to two problems, one is the differences of customers' preferences and the other is the difficulty of unifying the different preferences of customers. This approach can identify the products that meet the needs of major customers.

Manufacturing-based view – products are complied with the requirements, or specification. This concept applies to both services and products. Good quality product is not necessary in the eye of end-user but in the standards or specification set by the organisation.

Value-based view – quality is defined in terms of costs, prices and other attributes. Therefore, the materialization of customers' decision mostly depends on the quality at an acceptable price.

Evolution of Quality

There is a changing view of quality during the past twenty years, so improvement of quality is occured from time to time. Quality improvement not only focused in product but also services (Harold kerzner 2009, p. 875). Additionally, Harold kerzner has introduced a changing view of quality from past to present as shown in table 2. 1.

Table 2. Changing views of quality

Past

Present

Quality is the responsibility of blue-collar workers and direct labour employees working on the floor

Quality is everyone’s responsibility, including white-collar workers, the indirect labour force, and the overhead staff

Quality defects should be hidden from the customer (and possibily management)

Defect should be highlighted and brought to the surface for corrective action

Quality problems lead to blame, faulty justification, and excuses

Quality problems lead to cooperative solutions

Corrections-to-quality problems should be accomplished with minimum documentation

Documentation is essential for “ lesson learned” so that mistakes are not repeated

Increased quality will increase project costs

Improved quality saves money and increases business

Quality is internally focused

Quality is customer focused

Quality will not occur without close supervision of people

People want to ptoduce quality product

Quality occurs during project execution

Quality occurs at project initiation and must be planned for within the project

(Source: Harold kerzner 2009, p. 875).

Importance of Quality

There is no doubt that quality is extremely important because it will bring benefits. The benefits can be divided into two, they are internal benefits and external benefits. The figure 2. 1 below shows the internal benefits and external benefits from good quality.

(Source: Abhiman DasMulmi 2009, p. 7)

Figure 2. Internal benefits and external benefits from good quality

Historical Perspectives of Total Quality Management

There are four stages of evolution of Total Quality Management, they are Quality Inspection, Quality Control, Quality Assurance and Total Quality Management (TQM) (UTM 2003). Figure 2. 2 shows the four stages of Quality Management. Abhiman DasMulmi (2009) recogonised that quality management is also a hirarchical process which is initiated with rough inspection and then developed through quality control, followed by quality assurance under the wider management approach of TQM. Figure 2. 3 shows the different characteristics of different stages in TQM. The concept of TQM has been developed since 1950 by various American experts. Among the experts, W Edwards Deming, Joeseph Juran and A. V. Feigenbaum have contributed significantly in developing the concept of TQM.

Quality Inspection

Abhiman DasMulmi (April 2009) has stated that in order to ensure the basic level of quality to be accomplish, the most suitable use of quality control will be quality inspection. Once the inspector found out the poor quality product which is separated from the acceptable quality product, the product would be scrapped, reworked or sold as lower quality. Therefore, the method of inspection mainly sorts out the conformance and non-conformance of the product, it usually is done by visual inspection or testing (UTM 2003).

(Source: Dale 1994)

Figure 2. Four stages of quality management

Quality Control (QC)

Due to industrial advancement, it came to second stage of TQM development. Quality control is a stage above inspection (Abhiman DasMulmi April 2009). The quality was controlled through supervised skills, written specification, measurement and standardisation (Prof. Alessandro Brun 2010-2011).

The process of QC involves monitoring and then utilizing statistical techniques to make decision. Quality standard of products and services can be improved and maintained through QC (Abhiman DasMulmi April 2009).

Quality Assurance (QA)

Quality assurance (QA) is the third stages of quality evolution. It is aim to provide products and services that fulfill customers' expectations and needs (UTM 2003). QA can be defined as " a process of checking, correcting and

controlling is conducted in such a manner that the manufacture/ service providers are aware that all stages of the process are being conducted correctly with the specified standard" (Abhiman DasMulmi April 2009). Other activities such as comprehensive quality manuals, use of cost of quality, development of process control and auditing of quality systems are also developed in order to progress from quality control to the quality assurance (UTM 2003).

Total Quality Management (TQM)

Total Quality Management is the last stages of this development, it involves the understanding and implementation of quality management principles and concepts in every aspect of activities. (Prof. Alessandro Brun 2010-2011) The purpose of TQM is to fully utilise these activities to provide customers with best quality products or services at the lowest cost. Additionally, continually improve quality is the main aim of TQM to become a winning strategy to gain customer loyalty (UTM 2003).

(Source: Chew 2000)

Figure 2. Different characteristics of different stages in TQM

2. 2 Quality Assessment System in Construction (QLASSIC) & Construction Quality Assessment System (CONQUAS 21)

Introduction

In current scenario in Construction Industry, performance of completed product can be measured by implementing either QLASSIC or CONQUAS 21. Both of them are an independent assessment carried out by assessors to inspect, evaluate and measure the quality of workmanship.

QLASSIC

Quality Assessment System in Construction or QLASSIC is an independent method that developed by CIDB Malaysia to assess and evaluate the construction work which done by workman based on the approved standard (CIDB n. d.). On other hand, QLASSIC also act as a benchmark for contractor to achieve and maintain the quality of construction work (CIDB 2011) According to Ali & Faizal (n. d.), QLASSIC is a standard which expected to reduce contentious disputes between relevent parties such as architects, engineers, developers, purchasers, contractor regarding on constitution of acceptable quality and to ensure that the interest of buyers or purchasers is secured.

CONQUAS 21

Since year 1989, Construction Quality Assessment System or CONQUAS is introduced in Singapore to serve as a standard assessment system on building project. In year 1998, several features was added into CONQUAS by BCA, therefore, CONQUAS has evolved in a new edition which renamed as CONQUAS 21 (Building and Construction Authority 2008).

Comparison

Both quality assessment systems served as a same function to assess and evaluate the quality of workmanship of building project based on the approved standard. Besides, both of them are carried out through site inspection by assessors that have no any relationship with that particular project. Marks will be given after the assessment system is completed. Additionally, regardless of QLASSIC and CONQUAS, both of them are act as a

benchmark for contractor to achieve and maintain the quality of construction work.

Objective

CONQUAS 21 was designed with three objectives while the QLASSIC was designed with five objectives. Those objectives was designed and developed for the users to achieve.

QLASSIC (CIDB 2006)

To standardize the level of quality of the construction industry in Malaysia;

To measure the quality of workmanship of building project by implementing standard quality assessment system;

To measure quality of workmanship of a building project based on approved standard;

To appraise the performance of contractors based on quality of workmanship; and

To collect data for statistical analysis

CONQUAS 21 (BCA 2008)

To have a standard quality assessment system to assess quality of workmanship for construction works

To make quality assessment objective by

Measuring constructed work against workmanship standard and specification

Using a sampling approach to suitably represent the whole project

To enable quality assessment to be carried out systematically within timeframe budget

Comparison

On the whole, most of the objectives between CONQUAS 21 and QLASSIC are same, just present in different wording. The similarity of the objectives between both quality assessment systems is having a standard quality assessment to evaluate the quality of workmanship and measure construction work against workmanship standard and specification. There are some differences between CONQUAS 21 and QLASSIC. Firstly, one of the objectives of CONQUAS 21 is to enable quality assessment to be carried out systematically within time frame and budget. Secondly, QLASSIC is designed with another two objectives, they are to appraise the performance of contractors based on quality of workmanship and to collect data for statistical analysis.

Scope

In general, scope has been defined as the area or extent of an activity (Kernerman English Multilingual Dictionary 2010). CONQUAS 21 and QLASSIC have set out their scope or the covered area of the assessment. Therefore, both of the quality assessment systems set out the standards for various aspects of construction work (BCA 2008). Assessment on the quality of workmanship is carried out based on the various construction elements in the project and marks awarded are then summed up to give a total quality score for the building project (CIDB 2006).

QLASSIC (CIDB 2006)

Main elements to be covered in Quality Assessment System are as follows:

Structural works

Architectural works

Mechanical & Electrical works

External works

The above mentioned components can be further broken into different items such as internal finishes, external finishes, roof, sanitary work, electrical work and so on. However, the works such as piling, heavy foundation and sub-structure works which are heavily equipment-based and called under separate contracts or sub-contracts are excluded.

Undoubtedly, assessment is primarily based on workmanship standard through site inspection and field testing. Therefore, assessment on structural work and M&E works is carried out during the construction process, while for completed building project, assessment on architectural, M&E fitting and external works is executed to measure the quality of workmanship.

Other than site inspection, test on the material and the functional performance of selected services and installation also will be included in the assessment. Those tests can protect the interest of occupants in term of safety, comfort and aesthetic defects which will be surfaced only after some time.

CONQUAS 21 (BCA 2008)

Main components to be covered in CONQUAS are as follows:

Structural works

Architectural works

Mechanical & Electrical works

The above mentioned components can be further broken into different item such as internal finishes, external finishes, roof, sanitary work, electrical work and so on. However, the works such as piling, heavy foundation and sub-structure works which are heavily equipment-based, buried or covered and called under separate contracts or sub-contracts are excluded.

Undoubtedly, assessment is primarily based on workmanship standard through site inspection and field testing. Therefore, assessment on structural work and M&E works is carried out during the construction process, while for completed building project, assessment is only carried out on architectural work to measure the quality of workmanship.

Other than site inspection, test on the material and the functional performance of selected services and installation also will be included in the assessment. Those tests can protect the interest of occupants in term of safety, comfort and aesthetic defects which will be surfaced only after some time.

Comparison

It is obviously shown that there are four components covered in the QLASSIC while three components for the CONQUAS 21. The only difference between them is QLASSIC has an additional component, which is External works. In fact, the external work of CONQUAS 21 is grouped together with structural work.

Due to the additional component of QLASSIC, there are slightly differences on the quality assessment. For better understanding, the following table shows the differences of the quality assessment between them.

Table 2. Comparison of Components to be Tested Between QLASSIC and CONQUAS 21

Components to be tested

QLASSIC

During Construction process

Structural works and Mechanical & Electrical works.

Completed Building

Architectural works, Mechanical & Electrical works and External works.

Components to be Assessed

QLASSIC (CIDB 2006)

For the QLASSIC, the assessment is divided into 4 components:

Structural works

Structural is always deemed as an importance element of whole building because it might incur big amount of failure and repair cost once it failure. Therefore, the assessment of structural work comprises:

Site inspection of formwork, steel reinforcement, prefabricated or pre-cast elements, etc during construction.

Laboratory testing of compressive strength of concrete and tensile strength of steel reinforcement.

Non-destructive testing of the cover and the uniformity of hardened concrete.

Architectural works

Architectural works are mainly deal with the finishes. The quality and standards of workmanship can be showed obviously through the finishes.

Floors, ceiling, window and door and internal wall, fittings and fixtures, external wall, roofs, driveway, apron and porch are works under architectural.

Mechanical and Electrical (M&E) works

The quality of M&E works is also important because it might impact the performance of the building once its failure and high cost is involve in rectification works and installation works as well. Electrical works, air-conditioning and mechanical ventilation works (ACMV), fire protection works,

sanitary and plumbing works, lifts, escalator and other basic M&E fittings are covered under the assessment.

External works

Lastly, the external works cover the general external works elements in building construction such as the link ways/shelter, drains, road works, car parks, footpaths, turfings, playgrounds, gates and fences, swimming pools, hardscapes and electrical substation.

CONQUAS 21 (BCA 2008)

For the CONQUAS 21, the assessment is divided into 4 components:

Structural works

Structural is always deemed as an importance element of whole building because it might incur big amount of failure and repair cost once it failure. Therefore, the assessment of structural work comprises:

Site inspection of formwork, steel reinforcement, prefabricated or pre-cast elements, etc during construction.

Laboratory testing of compressive strength of concrete and tensile strength of steel reinforcement.

Non-destructive testing of the cover and the uniformity of hardened concrete.

Architectural works

Architectural works are mainly deal with the finishes. The quality and standards of workmanship can be showed obviously through the finishes. The assessment covers the following:

Site inspection of floors, internal walls, ceiling, window and door, fittings, roof, external walls of the building.

Material & functional tests such as window water-tightness, wet area water-tightness and adhesion of internal wall tiles. Installation of waterproofing for internal wet areas also included in the process of assessment.

Mechanical and Electrical (M&E) works

The quality of M&E works is also important because it might impact the performance of the building once its failure and high cost is involve in rectification works and installation works as well. Electrical works, air-conditioning and mechanical ventilation works (ACMV), fire protection works, sanitary and plumbing works, lifts, escalator and other basic M&E fittings are covered under the assessment. The stages of the assessment include:

Site inspection of installed works before they are concealed such as the concealed pipes

Site inspection of final installed works such as the Air-Handling units (AHU), cooling tower, fire alarm control panel, etc.

Performance tests on selected works such as earthing test, dry riser test and water pressure test, etc.

Comparison

The components of CONQUAS 21 and QLASSIC are quite similar. However, there is only one difference, it is CONQUAS 21 does not have external works. In fact, the external works was grouped together with structural works.

The following tables are the comparison of sub-components to be assessed between QLASSIC and CONQUAS 21:

Structural works

Table 2. Comparison of Sub-Components to be Assessed between QLASSIC and CONQUAS 21 (Structural Works)

Sub components to be assessed

QLASSIC

CONQUAS 21

Part 1: Reinforced Concrete Structures

Formwork

âˆš

âˆš

Reinforcement (Cash in-situ and Precast)

âˆš

âˆš

Finished Concrete (Cash in-situ and Precast)

âˆš

âˆš

Precast Specific Requirements

âˆš

âˆš

Structure Quality

âˆš

âˆš

Non-Destructive Testing

âˆš

âˆš

Part 2: Structural Steel Works

Main Member/ Partial Assembled Component

âˆš

âˆš

Metal Decking

âˆš

âˆš

Erection Tolerances

âˆš

âˆš

Corrosion and Fire Protection

âˆš

âˆš

Welding Test Reports

âˆš

Part 3: Pre-Stressed Concrete

Condition of Tendons & Anchorages

âˆš

âˆš

Installation of Sheathing

âˆš

âˆš

Stressing & Grouting Process

âˆš

âˆš

Debondling

âˆš

âˆš

(Source: CIDB 2006 and BCA 2008)

Architectural works

Table 2. Comparison of Sub-Components to be Assessed between QLASSIC and CONQUAS 21 (Architectural Works)

Sub-components to be assessed

QLASSIC

CONQUAS