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DEFECTS IN THE LIBYAN CONSTRUCTION INDUSTRY: A CASE STUDY OF BANI WALID CITY

Abstract:
Defects in newly completed buildings are fast becoming serious phenomena as more low cost and medium cost houses are being built. One of the many approaches that have been utilized to alleviate defects is the introduction of the zero defects concept in construction. This research is undertaken to find out the level of awareness and perception of construction industry players about this concept, and whether zero defects or an aim towards achieving zero defects is attainable. A review of the relevant literature on the subject of defects and the zero defects concepts was executed, followed by a field research in the form of a questionnaire. The scope of this paper encompasses a study of defects in construction industry, and the concept and its application in the local construction scene in Libya. This paper has managed to ascertain that despite the unenthusiastic responses from members in the industry towards this concept in general, most industry players are optimistic that defects can be reduced if certain constructive measures are taken. In summary, the findings of this paper are suggested that absolute zero defects may not be attainable, in concurrence with the literature review earlier. However, if proactive steps are taken, the quest towards achieving zero defects can be obtained.

Keywords:
zero defects, construction industry, awareness and perception, Libya

INTRODUCTION

The construction industry all around the world is getting modern, advance and growing day by day with the help of information technology age. Libya has a very big covered land and accordingly the requirement of the people is to develop big and better facility in the houses as well as in the housing society. One of the competition which government is facing is people want to pay more to buy better quality houses for the better living. To build an affordable and good quality housing schemes government has to use the strategic planning to over come this issue. Another important aspect of the construction industry is the residential part, the planning and the development of residential properties which hold special interest for estate management surveyors. Building designers' decisions affect long term quality a life cycle cost of buildings; the three most important design-related failure causes were weather impact, impacts from occupants and loads as well as moistures from the wet areas. Insufficient considerations for these failures causes were found to be the key in preventing these defects. The design strategies that could successfully prevent triggering these defects include aligning material performance against adverse weather conditions, preventing impact from occupants

and loads, preventing water leakage, improving specifications and improving design clarity, details, and layout. The Oxford Dictionary of Current English (1984) defines defects as 'lack of something essential, imperfection, shortcoming, failing. A defect is defined in ISO 8402 as the non-fulfillment of intended usage requirements. It means lacking and not meeting the required standard. A defect is present when there is a difference the required standard and the actual delivered standard. The concept of Zero defects are performance to agreed specification (Eaton, 1996; Al-Mahade et al., 2008). It literally means 100% error free. Is it attainable, or is it good enough to achieve a certain percentage of acceptable defects? The zero defects concept became popular when Crosby a quality manager developed a concept based on his beliefs that product should be defect-free when delivered to the customer (Harrington, 1998). This concept was neither a technique nor a methodology; it embodied an attitude that Crosby sought to instill in every individual. It focused on an individual's commitment to always meet the engineering specification. Defects may appear as a building is constructed or after an element of work is completed. In most standard forms of buildings contractors, there are usually provisions that require rectification of defects by the contractor at his own costs. The defects Liability Period (DLP) is a period of a number of months s stated in the contract, commencing from the day a project is certified practically completed and handed over to the client (Sikan, 2001). Defects in construction can result in very large costs. Even with minor defects; the operations of a quality may be impaired, resulting in increased costs and delays. Generally construction industry players believe that to achieve zero defects in construction is not possible. However it must be highlighted that the concept of zero defects in not only about achieving zero effects as an absolute goal, but also generating a different attitude towards work. It is about looking at projects from a customer's point of view and catering for their needs. It is about getting the work right the first time and delivering the project on time (Costain, 1998). Application of the zero defects concept in construction is relatively new, especially in Libya. It is a subject of discussion in many forums and researchers overseas and is being implemented to a certain extent in other parts of the world, especially in western countries and some Asian countries like Malaysia and Singapore. However, defects occur either because of poor design or low quality workmanship or because the building was not constructed according to the design or because it has been subjected to factors not followed for in the design. These causes may operate singly or in combination and result in defects indicated by changes in composition of materials in the construction itself; in the size, shape or weight of materials or parts of a building; or simply in appearance. One of the many approaches that have been devised to reduce this problem of defects in newly completed buildings is the introduction of the zero defects concept. This concept, which is generally synonymous with the manufacturing industry has become the subject of discussions in many forums, and has recorded laudable results in selected demonstration projects overseas. Therefore, the objective of this study is to identify the level of awareness of local industry players towards zero defects in Libyan construction, to find out the perception of local industry players towards zero defects. To study on the perception of local industry players in achieving zero. This study is exploratory and analytical in nature. The purpose is purely to provide some conclusive evidence on the construction defects in Libya.

RESEARCH PROBLEM

There are huge amount of standards and codes available internationally. However, each is designed specifically to overcome regional problems. There are some common problems from construction defects in homes and condominiums. As home buyer, it is the best interest to at least be aware of the potential construction defects that can occur in a home or a condominium (Steven, 2005). There are some common construction defect lists Al-Mahade et al., 2008. However, the following are descriptions of some common problems arising from some constructions defects in homes and condominiums in Libya (GPC, 2006; Al-Mahade et al., 2008): (i) Construction defects could be the result of improper design or installation deficiencies; and (ii) Construction defects could be due to substandard construction strategies, faulty workmanship inside and outside house,

bad building materials, poor drainage systems or improper soil analysis and preparation.

RESEARCH METHODOLOGY

All the date and information was collected from basically two sources. The first data sources are from published book, articles and journals, and internet websites. Secondly, primary date to be analyzed was collected from field researches, which are through questionnaires. The questionnaires were administrated over a period of two (20 weeks and another two (2) weeks were used to collect and key in the data. This questionnaire was distributed to 40 respondents, consisting of client's developers, consultants and contractors. The questionnaires were delivered personally, sent out by fax and e-mailed to the respondents. From 40 questionnaires distributed, 32 (80%) returned with completed answers. Data was coded and transferred to the computer and analyzed using the Statistical Package for Social Sciences (SPSS). The testing methods used were Descriptive statistics.

RESULTS ANALYSIS

From the responses gathered, it can be clearly figured out that the majority of respondents agreed that the local construction industry is plagued with defective works, especially in low cost and medium cost houses. Seventy nine percent had answered 'yes' whist only the remaining 21% answered in the negative. This corresponds with the increasing number of complaints received by the Ministry of Housing and Local Government for the past several years. When questioned about what are the most common defects often encountered in newly completed building? It resealed from that the most defects are cracks (70.7%) followed by defects related to structural defects (14.6%) while defects related to water intrusion/damp and other defects were least selected (Table 1). However, cracks in building may appear in many forms. Most cracks such as hairline cracks are not dangerous the appearance of a building. However, there are wide gaping cracks which are not only eyesores, but also pose a danger to inhabitants.

Thirty one and seven percent from the respondents selected poor workmanship as the major cause of defects (Table 2). All the respondents grouping also indicated a large majority for poor workmanship.

Table 1. Illustrate the most common defects in completed building in Libya

Type of defers	Percentages
Cracks	29 (70.7%)
Defect related to water intrusion / damp	4 (9.8%)
Detachment	2(4.9%)
Structural defects	6 (14.6%)

Table 2. What are the common causes often encountered

Type of causes	Percentages
Poor workmanship	13 (31.7%)
Poor supervision	19 (46.3%)
Inappropriate design / selection of materials	7 (17.1%)
Substandard materials	2 (4.9%)

The responded were also asked about their satisfaction with the overall quality of completed buildings by their organization. However, the majority (43.8%) stated they were sometimes satisfied while the remaining 34.4% were satisfied yes (Table 3).

Table 3. Overall quality of completed buildings by the organizations in Libya

Type of causes	Percentages and Frequencies
Yes	11 (26.8%)
Sometimes	18 (43.9%)
Most of the time	11 (26.8%)
Never	1 (2.4%)

When asked whether the implementation of quality programmes can help to reduce defects in construction end products, 84.4% had answered 'yes', whilst only the remaining 15.6% answered in the negative. However, as results, it is clearly observed that a huge number of the respondents gave positive answers. Awareness about the zero defects concept in construction is not relatively high because 44 % had answered 'yes', whilst only the remaining 56% answered negatively. When questioned "are you aware of the zero defects house construction programme launched by the Ministry of Housing and Local Government. The results of the survey showed that the awareness of the clients. 54% had answered, 'Yes', whilst only the remaining 46 % answered in the negative. On the other hand, when we questioned " Are you aware of the construction industry standard. Fifty six percent of the respondents were aware of these systems from their responses to the above mentioned question. The respondents 80% surveyed

believed that the Ministry of Housing and Local Government is not doing enough to increase the awareness of industry players to reduce defects in newly completed building. This strengthens the point that more need to be done on the part of the authorities to assist industry players in producing better quality building with fewer defects. A majority of the respondents (80%) have believed that quality programme can be implemented effectively in the local construction industry which respondents a rather optimistic view. Therefore to ensure effective implementation, certain aspects which are unique to the construction industry must be addressed. To improve the quality in construction end products and eventually promote a zero defects culture in the industry. An overall large majority of 34.1% of respondents pointed towards that training and implementation as the most important factors followed by awareness programmes (Table4).

Table 4. Contributing towards reducing defects, and eventually promote a zero defects culture

Type of causes	*Percentages and Frequencies*
Awareness	*10 (24.4%)*
Training	*14 (34.1%)*
Implementation	*14 (34.1%)*
Alternative	*3 (7.3%)*

Selection training programmes for both local and foreign workers as the next contributor is very much related to the common causes of defects where, poor workmanship had been chosen as the most common cause of defects in building. Thus, proper and effective training programmes as well as stricter enforcement must be devised by the relevant authorities to ensure only qualified or skilled workman are followed on sites.

CONCLUSION AND RECOMMENDATION

Defects in buildings are numerous and varied, either in the local construction scenario, or in other parts of the world. The problem of the considerable extent of defects present in our newly completed buildings must be overcome as it severely affects the construction industry. It has been accomplished through this paper that many industry players agreed with the assumption that the local construction industry is plagued with defective works. If the present situation persists, the local industry will not be able to complete either locally or internationally, given the current tend towards globalization. Therefore, this problem must be given due consideration and not to be taken lightly by all the parties involved. The role of authorities such as MHLG was also found to be lacking. More programmes to increase awareness of the people involved in the industry should be carried out. The result of this paper indicated that a fair majority of industry players believe that, while 100% defect free, or zero defects is not free attainable, the setting of a goal towards zero defects is achievable. Stricter enforcement must also be employed in implementing quality programmes.

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