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## **Poor Workmanship in Construction of Low Cost Housing**

*Most defects in construction projects are due to human error. In other word, we can say that human error happened due to poor performance in workmanship during construction of a building. Poor workmanship in housing construction, and poor management and control of building contractors have contributed to the housing problem. According to research conducted by the Building Research Establishment (BRE), 90% of building failures are due to problems arising in the design and construction stages. These problems include poor communication, inadequate information or failure to check information, inadequate checks and controls, lack of technical expertise and skills, and inadequate feedback leading to recurring errors. The quality issues of low cost housing nowadays begin to arise as there are many complaints about defects in some of the building elements of the house. One of the causes of this condition is due to poor quality of workmanship during construction. This will affect the quality of life of occupants and also giving bad image of the parties involved in the construction of low cost housing. This paper will discuss some variables that related to the causes of poor quality of workmanship in construction projects and some common building defects found at low cost housing.*

**Keywords:** *building defects, workmanship, low cost housing, project management, poor quality*

### **1. Introduction**

Atkinson [1] stated that most defects in construction projects are due to human error. In other word, we can say that human error happened due to poor performance in workmanship during construction of a building.

Zunguzane [2] found that poor workmanship in housing construction, and poor management and control of building contractors have contributed to the housing problem. He also quoted from Nima et. al. [3], which found that according

to research conducted by the Building Research Establishment (BRE), 90% of building failures are due to problems arising in the design and construction stages. This problems include poor communication, inadequate information or failure to check information, inadequate checks and controls, lack of technical expertise and skills, and inadequate feedback leading to recurring errors. Shittu et al [4] note that most of these problems are mainly 'people' related problem.

Ali and Wen [5] found that, factors contributing to the lack of success and the non-achievement of quality in the low-income housing sector include lack of sufficient finance, use of unskilled labour, use of emerging contractors, lack of contribution by the private sector, lack of managemet commitment towars quality achievement, and substandard quality of workmanship.

Ahzahar et al [6] mentioned that faulty during construction or better known as poor workmanship is one of the popular factor that lead to building defects and failures problems. Usually residential buildings are the one which experienced most of the defects or failures problems due to poor workmanship. Poor workmanship problems are closely related to the developer and also the contractor that construct the buildings. He added that in Malaysia's construction industry, these problems always been a highlight in the media especially through television, and newspapers reported that newly constructed residential experienced defects due to poor workmanship by the developer.

Zaidi et al [7] through their research in Australian housing industry, mention that the Australian housing industry is beset with quality issues with repeated building defects causing problems with customer satisfaction and housing performance. He added that these defects are caused by a combination of initial poor workmanship and poor quality materials and subsequently by poorly executed or inadequate maintenance. These poor work practices increase the cost and maintenance of housing.

According to Abdul Rahman et al [8], the rate of construction project accomplishment is weak because of the rapid increasing rate of major defects in building as a result of poor quality materials and workmanship which has been identified as the major cause of defects in construction projects.

## **2. Causes of Poor Quality of Workmanship in Construction**

Abdul Rahman et al [8] stated that workmanship was classified as one of the most frequent non-conformance on construction site and therefore through literatures, eight variables that related to the causes of poor quality of workmanship in construction projects had been found out.

### **2.1. Poor project management**

Ineptitude management is generally recognized as a major factor of poor construction productivity. Management factors may due to the insufficient of

supervision on site [9]. In addition, poor supervision on site also contributes to poor workmanship during construction and this can be seen at many occasion on site. Besides that, he added the ability of management especially on construction site is important as it is the primary cause which affects the labours daily productivity. Therefore, poor project management is one of the factors contribute to poor workmanship.

## **2.2. Complicated role of subcontractor**

Kasun and Janaka [10] quoted, the role of subcontractor is one of the factors contribute to construction deficiency (poor workmanship) and many people are not always focus on this factor. However, in fact, the role of subcontractor is important in construction work. This is because most of the site work is completed by subcontractors. Approximately 90% of the site work is done by variety of subcontractors whereas main contractor is only focus on management and coordination.

Besides, because of there are involvement of various types of subcontractor in same construction project, the main contractor is difficult to inspect, supervise and control the works that have been done by the subcontractors and therefore, this complicated role of subcontractor in construction projects can contribute to poor workmanship.

## **2.3. Lack of skills and experience and issue of labors competency**

Industry stakeholders agreed that insufficient of skilled manpower is the most important matter that they concern about in construction. Apart from that, some construction companies in Turkey usually prefer to employ short-term unskilled labours and consequently cause the fault in the process of attaining the stability of quality associated issues. Hence, lack of experiences and competency of labours must be taken into account as a factor contributes to poor workmanship as "productivity cannot be achieved by speed and harder work only without adopting better work practices".

## **2.4. Language barrier to communication and lack of communication**

Different language between the foreign labours and local supervisors causes the communication failure on the site. This is because many foreign workers are not able to speak in local language fluently. This consequently causes the misunderstanding by the labours in their work scope and then lead to poor workmanship

## **2.5. Unsuitable construction equipments**

Suitability of construction equipments can influence the workmanship quality in construction.

## **2.6. Poor weather condition**

Extreme climate condition is one of the factors that affecting construction labour productivity and workmanship.

## **2.7. Limited time**

Atkinson [1] mentioned that insufficient time caused the construction projects executed to be rushed. A number of "show houses" on the site were required for many construction projects. Many concurrent works were carried out and inadequate checking had been carried out by the senior managers sequentially caused by the speed of working. As a result, the deficiency of workmanship had been happened. In short, limited time causes low quality of workmanship in construction.

## **2.8. Limited cost**

Insufficient cost or budget would cause inadequate allocation of cost in construction project. Labour cost is included in construction cost. Labour element is considered as the most difficult component to price within the reasonable level of accuracy. Obviously, labour costs estimation is considered as uncertainty. In addition, contractors who are not preparing sufficient budget from the project will cause the labour cost cut down correspondingly. As a result, the labour supplied are not sufficient to complete a project and construction defects may appear.

## **2.9. Unsuitable construction materials**

Most buildings use building materials which are easily available locally. Such building materials include timber, stone, brick and plaster. In the materials management of building, understanding the nature of the building materials and accurate diagnosis of defects is most important [6]. Therefore, lack of understanding about the proper technique of preservation of the materials and structures and familiarity with the common building materials used by the consultant and contractors can contribute to building defects.

On the other hand, sometimes the contractors responsible to construct the building manage to use lower grades materials such as concrete, and method that are not according to the specification without the permission or without the client and consultant awareness.

### **3. Types of Building Defects**

A housing or construction defects is a building flaw or design mistake that reduce the value of the house, and/or cause a dangerous condition. Some defects are obvious (such as water seepages) but many are less obvious and do not become apparent until years after a building was constructed and being occupied.

A construction defects can arise from a variety of factors, such as poor workmanship or the use of unsuitable or low quality of materials. Among the most common defects that can be found on building element of housing are as follows.

#### **3.1. Cracking**

In construction, cracks on building element such as walls usually occurred because of overloading or the structure has settled or heaved. Vertical and angled cracks are usually caused by settlement or heaving. Horizontal cracks are more likely to be caused by lateral pressure. Cracks commonly occur in areas such as interior walls, exterior walls, and at the corner of door, windows and ceiling.

#### **3.2. Settlement**

Settlement in a structure refers to the distortion or disruption of parts of a building due to either unequal compression of its foundation, shrinkage such as that which occurs in timber framed buildings as the frame adjust its moisture content, or by undue loads being applied to the building after its initial construction.

#### **3.3. Deterioration of roof covering**

Roofing system contains many components, such as framing, plywood decking, felt underlayment, sheet metal flashing and other exterior roofing material. Construction defects in roof system can cause damage to personal property in a home or building, and also to the interior framing members, ceiling, drywall, and paint by allowing water into the building. Common roof system construction defects are broken roof tiles, damaged framing, exposed damage felt, improper flashing, raised shadow board and loose tiles. A faulty installation grammatically increases the likelihood of problems and reduces a roof system's life expectancy.

#### **3.4. Internal staining, mould growth and fungal on external wall**

If there is a water intrusion, the chances of mold growth are high. The presence of mold on a wall of house can affect occupant's health. Once discovered, mold infestation should be remediated immediately in an effort to minimize the possibility of health issues.

### **3.5. Dampness**

In general, damp is defined as unwanted water or moisture and its existence in building is one of the most damaging failures that can occur. It can cause damage in brickwork by saturating it, decay and break-up mortar joints, rot timber structures, make iron and steel corrode and damage to building equipment.

### **3.6. Peeling paint**

Peeling paint usually occurs on building facades, mainly on plastered walls, columns and other areas that are exposed to excessive rain and dampness. The amount of constant wind, rain and sun received can easily turn the surfaces of the paint to become chalky and wrinkled or blistered. This problem can become worse if the paint used during construction are low quality and mixed with excessive amount of water.

### **3.7. Leakage**

Leaking is water that seeps out from behind walls, under concrete slabs and asphalts, basements, landscaping, water intrusion in roofs, irrigation systems, and radiant heat system. Leaking mostly happened due to improper installation of piping system that can cause dampness and mold growth.

## **4. Conclusions**

Poor workmanship is one of the popular factor that lead to building defects and failures problems. Usually residential buildings are the one which experienced most of the defects or failures problems due to poor workmanship. Poor workmanship problems are closely related to the developer and also the contractor that construct the buildings. It should be pointed out that 90% of the building failures are due to problems arising in the design and construction stages. This problems include poor communication, inadequate information or failure to check information, inadequate checks and controls, lack of technical expertise and skills, and inadequate feedback leading to recurring errors.

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