

QUALITY ASSESSMENT COSTS IN BUILDING CONSTRUCTION

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Abstract: *Building activity focuses activity of several people, such as builders, designers, developers, authorities, beneficiaries. Quality in construction is a main problem faced by them. Quality is a concept defined by experts over time as being: quality is fitness to use, conformance to requirements, quality is everyone's job, quality is free. Quality costs, an important factor in decision making, are divided into four categories: prevention costs, evaluation costs, internal failures costs, external failures costs. Quality assessment costs represent those costs made in order to check whether the quality requirements. These include costs of inspection, verification, laboratory testing, clarifications and so on. The purpose of this paper is to analyze the costs of quality assessment in a project to achieve a residential construction.*

Key words: *quality, quality costs, quality assessment costs, constructions defects*

1. Introduction

An important role in the development and economic growth of a strong country is occupied by the history of constructions. January 2016 recorded an increase of 6.7% of the construction works over the same month of the previous year. The construction sector contributed to GDP last year to 7.4%, increased by 20%, an increase which must be associated with the previous period. The volume of construction works performed on construction objects, have increased as follows: 18.7% residential buildings, 15.8% engineering constructions and non-residential buildings by 5.5%.

In a study published by the National Statistics Institute specifies that at the end of 2015 new buildings increased by 4.8%, capital repair works by 23.5% and the maintenance and current repairs by 14.4% (www.zf.ro).

2. Sources for Defects in Construction

Construction defects are found quite often and have different causes. In order to correct and eliminate defects it is absolutely necessary to know the source and causes.

A construction defect is one component that is not built as planned, specifications or in accordance with the rules and

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standards. The features defects are varied and depend on many factors. A classification of defects characteristics is shown in Fig. 1

(<http://insurancethoughtleadership.com>).

The materials used for stable and reliable construction must be high quality to last long and leave no place for flaws. Some problems that may arise due to the use of inferior quality materials are cracks in concrete structures bearing capacity decrease, degradations that can lead to the inability of using the building.

The lack of a quality is a very important cause of the construction achievement. First, failure to check the quality of construction works can lead to defects requiring difficult to repair or rebuilding. Secondly, by lack quality system, can further enhance Expenditures of the project.

According to ISO 9001, each procedure must be detailed and contain all the necessary steps to achieve. In a construction company must have procedures for cation type of work. The existence of these procedures contribute to good management quality hence the achievement prevent defects in construction.

The execution details and specifications ensure the smooth execution of construction. The lack of these details can lead to execution of construction with large unsupported deviations. A complex structure needs time to achievement of the way and execution details. In a complex structures can lose sight of the very important elements - sustaining. It is very important that a complex structure to be easily understood. These possible sources can cause costs extra work hours, wasted materials, and so on.

Defects and nonconformities are difficult to avoid construction activity. Through a system of quality assurance by respecting of the project, execution details, the

specifications and using skilled labor will result minimizing defects, and avoiding increased project costs.



Fig. 1. Causes of construction defects
(<http://insurancethoughtleadership.com>)

3. Quality costs

Since 1950 they have developed different theories regarding quality-oriented costs. "Cost of Quality" can have different meanings. For some people can mean costs of poor quality, and for other costs to achieve quality. Quality costs are usually understood as the sum of the costs of compliance and non-compliance. Compliance costs are paid to prevent deficiencies and noncompliance those costs are known to be of poor quality due to lack of quality products and services. Companies in the construction business, rarely have a realistic idea about the profit lost through poor quality.

Small firms often have no allocated budget for quality and do not try to monitor the quality costs.

Basically, quality costs represent an association between prevention costs, appraisal costs and internal and external failures costs and is an indicator that expresses the efforts that are made to maintain and improve quality.

Fig. 2 are presented detailing quality costs specific construction activity.

It is estimated that approximately 60-70% of total quality costs are the result of internal and external failures. These are controllable with efforts from management.

The largest share in the cost quality structure quality is the external cost of failure. On the next position they are located internal failures costs. Costs quality assessment are located in third place. Prevention costs have the lowest share.

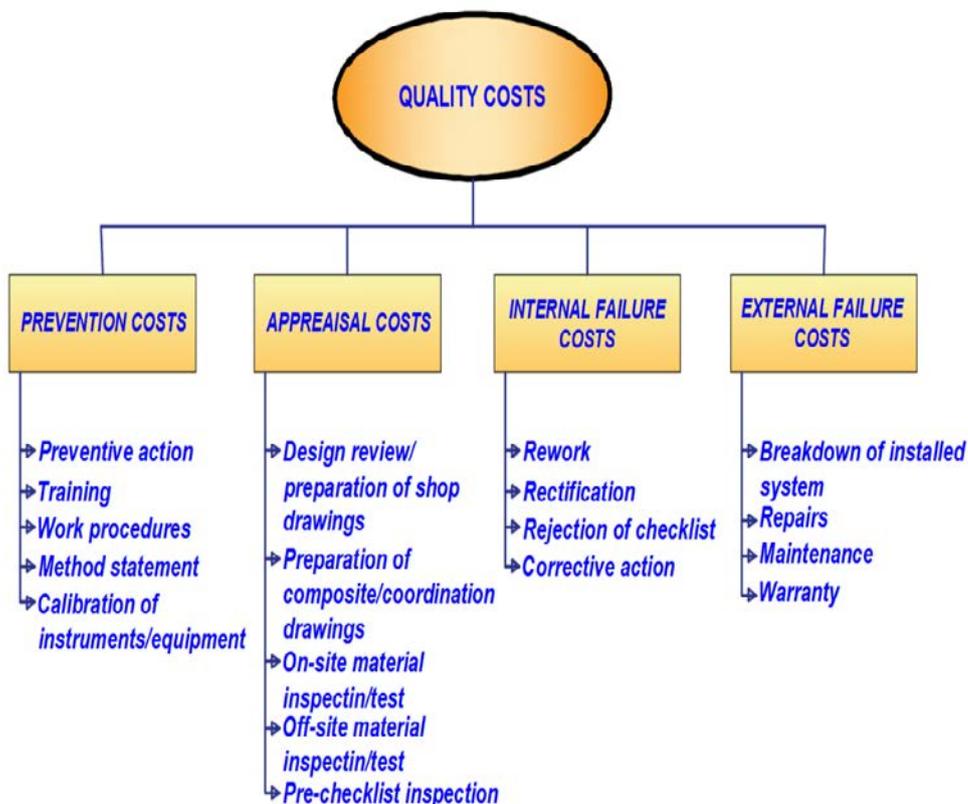


Fig.2. *Quality costs*

3.1. Prevention Cost

These costs are incurred to keep failures and appraisal costs to a minimum. Prevention costs are costs due to any activity undertaken to investigate, prevent or reduce defects, errors, undertake any activity that makes the product does not meet a certain specification.

In general, these costs are considered investments, having practically aimed at identifying and controlling the causes of quality defects and other non-conformances.

3.2. Quality Assessment Costs

Quality assurance is based primarily on the principle of quality and is part of the broad concept of quality control. The main purpose of quality assurance is to check if quality requirements are met.

Quality assurance involves performance evaluation after operations are completed and the information are communicated to the persons responsible for quality control.

Fig. 3 represents Ishikawa's diagram and illustrates that the quality assurance is in the center of quality control, so trust and satisfaction to be long term. Quality assessment costs represent costs incurred to establish the compliance with the quality requirements, appropriate, specified by the quality system.

These costs include the activities of the quality control checks, inspections and laboratory tests.

They do not reduce the number of errors, but reduce the number of errors that reach the customer.

A synonym for quality assessment costs can be cost inspection. Making a construction quality control and laboratory tests are required. Control can take place before production phase, during or after step.

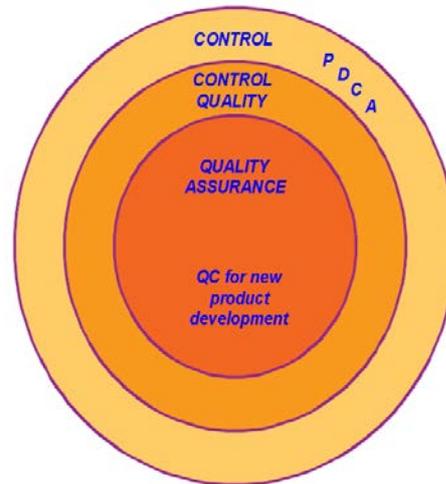


Fig. 3. *Company-wide Quality Control* (Ishikawa, 1985)

The stability of a building is very important. Failures and repair costs have significant value. Structure works evaluated are presented in Fig. 4.

3.3. External Failure Costs

External failure costs are associated with deficiencies that are found after the customer receives the product. External failure costs represent a category of the total cost of quality that are related to defects founded after product is delivered to customer.

External failure cost is generally the biggest part of the categories of quality costs, because all the processes involved were effectuate to get the product to the customer. These costs are supported because the shipped product failed to comply with the quality requirements.

3.4. Internal Failure Costs

Internal failure costs occur from manufacturing firms, from failure to achieve specified quality, being the cost of correcting the products or services that do

not meet the provisions of the quality standards.

These costs arise when the quality deficiencies / defects are discovered within the company before to delivery of products to the client.

These costs include costs for delays, redesign, retest, weak competence and poor management.

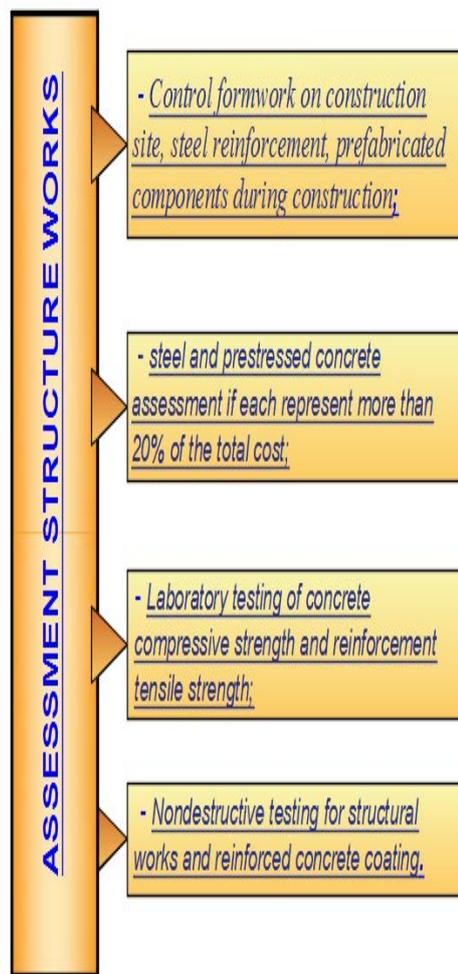


Fig. 4. Evaluated structure works

4. Summary

Quality costs is an important indicator for expressing a valuable efforts made for

improving and maintaining an optimal quality level.

Making quality construction must be done in terms of efficiency. Therefore, there must be an optimal balance between quality and cost.

Quality assessment costs arising from need for the verification and ensure the quality requirements at every stage of execution. Control can be achieved in stages during execution or immediately afterwards.

This prevents transmission errors in subsequent stages and, most importantly, reducing errors that reach the recipient. Using quality cost provides effective management quality assessment and identification errors.

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