Analysis of Quality Management System In Construction

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Abstract- *Construction industry plays an important role in the development of any country. The development of construction industry depends on the quality of construction products and projects. Quality is one of the critical factors in the success of construction projects in Pakistan. Improvement in the quality of construction projects is linked with quality management in the project life cycle. Although quality management at every stage of project life cycle is important but the quality management at the design and construction stage contributes significantly on final quality outcome of construction projects. This paper therefore highlights the importance of quality management in the design and construction phase. It presents the findings of two major cities in Pakistan and suggests some proactive measures for the improvement of quality in the design and execution phase of construction projects.*

Keywords- Quality Management, Project Life Cycle, Design and Construction Phase

I. INTRODUCTION

Globally, construction industry is one of the largest contributors to the Gross Domestic Profit (GDP) of any country. The construction projects has increased rapidly in the recent years, reflecting the interest of private and public sector investing more funds into property development. As the investment has increased the expectation of quality product has also increased. Now quality management has become an integral part of construction. Acknowledging the quality issues in construction and increasing demand for quality products, specific regulations to the implementation of the Quality Management Systems have been framed. ISO 9001 standards were set up for this purpose. Market quality problem for Russian companies is very acute because the competition on the international is intense. Implementation of the quality management system (QMS) will help bring the company to a new level, because the QMS is designed to continually improve the activities of companies. The largest developer of voluntary international standards is the international organization for standardization – ISO. It began its work in 1947, and since then has published more than 21 thousands of standards covering almost all aspects of technology and production.

A. Importance of Quality Management

Quality is one of the critical factors in the success of construction projects. Quality of construction projects, as well as project success, can be regarded as the fulfillment of expectations (i.e. the satisfaction) of the project participants. The construction industry in Pakistan has been struggling with quality issues for many years. A significant amount of the budget is spent each year on infrastructure and other development projects. Since the quality outcomes of the projects are not according to required standards, faulty construction takes place. Consequently additional investments are required for removal of defects and maintenance work. A construction project in its life span goes through different phases. The main phases of a project can be described as: conceptual planning, feasibility study, design, procurement, construction, acceptance, operation and maintenance. Quality of construction projects is linked with proper quality management in all the phases of project life cycle. Design and construction are the two important phases of project life cycle which affect the quality outcome of construction projects significantly. In a NEDO (National Economic Development Office), London survey aimed at improving methods of quality control for building works, it was found that "design" and "poor workmanship in the construction process" combined to form more than 90% of the total failure events . This paper therefore, focuses on the quality management in the design and execution phase of construction projects. The aim of this paper is to highlight the importance of quality management in the design and execution phase of construction projects. In order to achieve that, a case study is designed for two major cities of Pakistan.

B. Objectives

The main objectives of the project are:

- This project mainly focuses the importance and factors that affects the quality management in the execution(Construction) phase.

- The project also includes visiting of some construction companies and identifies the quality problems.
- To identify the benefits of implementing ISO 9001 Quality Management System in the construction companies.

II. LITERATURE REVIEW

Sergey Lukichev et.al. The quality management system needs to be developed in our country. ISO 9001:2015 aims to create a management system, therefore, the QMS may improve competitiveness in the global market. And therefore further demand for certification will increase.

Anup W S et.al.the results of the analysis and the case study data. Suitable suggestions on how to overcome the issues of implementation of QMS has been made by consulting the experts through an unstructured interview.

D.Ashokkumar et.al. Analyze the difficulties (major factors) and the cost variance due to quality defect in quality management and suggests some proactive measures for the improvement of quality in the execution phase of construction projects.

Pravin P. Mane et.al the questionnaires have been prepared by authors based on quality aspects in construction project for builder / contractor, consultants and customers / occupants of buildings. This paper describes the analysis of data collected during interviews & questionnaires with builder / contractor.

Abdul-Rahman et.al. The state of quality management in construction projects in Malaysia needs to be strengthened and there are problems in relation to quality management implementation that require attention and further research.

J. J. Smallwood et.al. Implementing a documented QMS; cost, client satisfaction, productivity and future work predominated among factors negatively affected by non-achievement of quality, and unqualified artisans, shortened project periods, inadequate details and inadequate specifications predominated among factors which negatively affect quality.

III. METHODOLOGY

A. ISO 9001

ISO 9001 is an International Standard that gives requirements for an organization's quality management system (QMS). It is part of a family of standards published by the International Organization for Standardization (ISO) and often referred to collectively as the " ISO 9000 series " or " ISO 9000 family ". For this reason, you may sometimes hear your suppliers refer to being " ISO 9000 certified ", or having an " ISO 9000-compliant QMS ". This will normally mean that they are claiming to have a QMS that meets the requirements of ISO 9001, the only standard in the ISO 9000 family that can be used for the purpose of conformity assessment. It is important to understand, however, that ISO is the body that develops and publishes the standard – ISO does not "certify " organizations, as will be explained later in this text. The quality concept has been known since antiquity, but the significance and approach to quality have evolved over time. Associated until recently within the technical field, quality is currently associated with management. As Feigenbaum (1983) says, "quality is a way of manage". Quality has become a big issue in the 1980s since Japanese companies have won international markets by investing in quality.

IV. PROBLEM STATEMENT

A. Study Area 1- Pebbles Urbenia

Fig 1.3D view of Pebbles Urbenia

Table 1. Project Details

1	Name of Project	Pride Purple Square
2	Name of Developer	Pride Purple Properties
3	Structural consultant	G.H bhilare consultant
4	Project Management Consultant	Arcon3aharashtr
5	RCC contractor	Sanavi Enterprises
6	Area of Project	5 acres
7	Total Cost	35 cr
8	Location Of site	Bavdhanpune ,Maharashtra
9	ISO 9001	Applied

B. Study Area 2 – Pride Purple Square

Fig 2. 3D view of Pride Purple Square

Table 2.Project Details

1	Name of Project	Pebbles urbania
2	Name of Developer	ASR promoters & Developers LLP
3	Structural consultant	Deltacom Structural Consultants
4	Project Management Consultant	MoonsezConsultants
5	RCC contractor	Rishonn Infrastructure
6	Number of Floors	G+5
7	Total Units	159
8	Location Of site	Wakad, Pune ,Maharashtra
9	ISO 9001	Not Applied

IV. FACTOR AFFECTING CONSTRUCTION QUALITY MANAGEMENT

There are several factors that impede the management of construction quality in developing countries.

- **Organizational Structure**

Baring few corporate firms, most construction companies lack the well-defined organizational setup. The Indian construction sector comprises of approximately 250 corporate firms as against 7.2 lakh Class A contractors and sub- contractors who execute 90 percent of construction jobs. Most contractors operate with skeletal and have an adhoc approach towards resource mobilization. Quality management through sound organizational setup is still an alien concept to these firms.

- **Lack of Technical Expertise**

Construction industry in developing countries needs to equip itself with technical capabilities, both the human and nonhuman, to ensure effective quality assurance on and off the construction sites. Most contractors lack the financial capabilities to support such kind of in-house facility. The staff responsible for implementation of quality is inadequately trained and in most construction projects on-site quality checks are carried out by relatively less experienced supervisory personnel.

- **Technological Developments in Allied Industries**

The construction sector has major linkages with the building material industry since material accounts for 58-60 per cent of Construction cost. These materials include cement, steel, building blocks, roofing material, fittings/fixtures, glass, paints, chemicals etc. Bulk of these materials is manufactured in the unorganized sector using low-grade technology. The quality of materials is critical in ensuring the construction quality; ironically the locally produced materials are characterized by lack of quality and standards.

- **Quality Certification**

With the emergence of new trade regime under WTO, companies are being persuaded to adopt quality management systems in order to meet the demands of customers in a globalized market. During last two decades, ISO 9000, a series of international quality standards, has emerged as a system that can be applied to different types of business organizations to obtain improvements in quality procedure and product. The appropriateness of ISO 9000 to construction industry is still a matter of debate since the end product of construction process is not a repetitive unit but an endeavor that may be unique in its design and composition. International construction firms operating in developing countries pursuing ISO certification as it is increasingly becomingmandatory for bidding in projects funded by national and international agencies.

V. EXPECTED CONCLUSION

Poor quality in design and construction affects the maintenance cost and level of service of the project. Therefore this paper will concludes that the consultants and contractors

should take some proactive measures in order to improve the quality in the design and execution phase of construction projects.

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