ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 8, Issue, 07, pp.34019-34022, July, 2016

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

REVIEW ARTICLE

STUDY OF QUALITY ASSURANCE AND QUALITY MANAGEMENT SYSTEM IN MULTISTROYED RCC BUILDING

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ARTICLE INFO

Article History:
Received 30th April, 2016
Received in revised form
25th May, 2016
Accepted 04th June, 2016
Published online 16th July, 2016

Key words:

Quality management.

ABSTRACT

Quality is one of the important aspects for construction projects. The level of success of construction projects depends upon the quality performance. Quality management provides the environment within related tools, techniques, procedures that can be deployed effectively leading to success of construction project. Though quality management is important at every stage of the project but quality management at execution stage contribute significantly on final quality outcome of construction projects. This paper proposes Quality Management System for a construction site located in Pune which aims to raise quality of works and to improve the consciousness in staff at different managerial level about the quality management concepts and its importance in construction industry.

Citation: Dheeraj A Bumb and Ghaitidak, D. M. 2016. "Study of quality assurance and quality management system in Multistroyed RCC building", *International Journal of Current Research*, 8, (07), 34019-34022.

INTRODUCTION

Construction Industry plays a major role in the economic growth of a nation and occupies a pivotal position in the nation's development plans. India's construction industry employs a work force of nearly 3.2crores. It is the second largest contributor to the GDP after the agricultural sector. Construction sector is seen as a service industry. It generates substantial employment and provides growth in other manufacturing sectors like cement, bitumen, iron and steel, chemicals, bricks, paints, tiles etc. 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 of the project participants. The construction industry in India 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

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Literature review

A. Lydia (2010)

The guidelines to ensure the quality in planning are: (i) Ensure that all relevant parties involved including consultants, subcontractors and suppliers are included in the task of quality planning for the project; (ii) Establish and define the purpose of the quality system; (iii) In the plan, minimize the effort required to amend copies of documents; (iv) Set up a quality system development team so that the team can produce an effective plan; (v) Ensure that throughout the quality planning task constantly focused on the customer requirements. Construction is a multifarious process involving many organizations on a single project; however, the contractor's, consultant's and client's roles are pivotal for the success of any project. Contractors work as the interface between the public and the industry and they demonstrate the real performance of the industry. They are the public face of the construction industry. Their performance, focuses, policies, processes and methods have a direct impact on all stakeholders in the industry.

B. Abdul Aziz *et al*. (1999)

Quality systems involve internal and external aspects. An internal quality system covers activities aimed at providing confidence to the management of an organization that the

intended quality is being achieved. This is called a "quality management system". Successful implementation of quality management system can contribute to an increase in product quality, improvement in workmanship and efficiency, a decrease in wastage, and increase profit. Meanwhile, an external quality system covers activities aimed at inspiring confidence in the client that the supplier's quality system will provide a product or service that will satisfy the client's quality requirements.

C. Kam and Tang (1997)

Mentioned that quality management system implementation can improve the competitiveness of an organization by focusing on customer needs and providing quality training for all levels in an organization in order to meet the customer requirements. Hence, the implementation of QMS not only improving intra- project communication, it also increase client confident and help the construction company to be more focus on customer expectation.

D. Saqhi *et al*. (2015)

Reported a research to give insight about quality practices, tools, techniques, management commitment towards quality implementation in construction projects. It also explores the issues faced during the implementation of Quality Management Systems. The research uses a qualitative questionnaire approach to gather data. A case study which substantiates the questionnaire is conducted using content analysis method. Conclusions are drawn based on 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.

Problem statement and objective

In other manufacturing industries are establishing the TQM (Total Quality Management) system but in construction industry we are not able to establish even QMS (Quality Management System). The reason behind this is quality which is ever changing factor i.e. quality changes time to time, place to place. But many common activities in construction project like the concreting work, Brick work, plastering, waterproofing etc. Those common works are affected by some major factors like quality of material, quality of workmanship, construction detailing and drawing, concrete work, etc. Quality Management System is more helpful for creating cost oriented quality awareness in construction companies

A.Objectives

- Investigate the implementation of QMS in the construction industry.
- Determine the major factors that are mostly affect the quality of construction during the construction particularly during execution phase.
- To minimize the indirect cost of the project and also reduce the wastage of wastage of materials, time, money, manpower, etc.
- To propose site quality control system for construction project

B.Methodology

- Adopting mix of literature survey.
- Taking market studies from different types of companies.
- Discussion with different construction company's management and taking detailed questionnaire survey

Data collection and analysis

The main purpose of the proposed site management system is to:

1. Verify, during the course of the construction that the site works are executed according to the required level of quality specified in work order or the contract document
2. Create documents, which demonstrate that the quality of the related work has been monitored during the execution works itself.

Responsibility and Authority of the Quality Management Department

In order to achieve the requirements of quality management for the quality management department, the high management for these companies has to give this department the necessary authorization and give each person who works in this department his/her responsibility. These authorizations and responsibilities must be delegated and assigned to the quality management department to improve its ability in:

1. Indicating the weaknesses in any department or section in the company, and giving solutions to the top management of the company about those weaknesses;
2. Suggesting new systems for quality management to serve the site work;
3. Modifying the decisions of the site quality management, when necessary;
4. Ensuring the quality of the design;
5. Checking the construction team's requirements to be employed for the site;
6. Giving advises that are concerned with the cost of the required quality;
7. Improving the qualification of the company's personnel by training them on the quality management concepts;
8. Choosing the work team to achieve the site quality management requirements;
9. Establishing the suitable site quality system and giving the work team their responsibilities;
10. Developing a computerized information center concerned with the site quality management of the construction projects.

The purpose of this center is to keep documented all the quality management information to be used for cost analysis of any quality management decision.

Responsibilities of the Site Quality Management System Personnel:

The quality management team has to determine the responsibility of each one of the personnel working for site quality management. These are:

1. Site Quality Manager

Quality management elects the site quality manager; he is always questioned by the quality management department.

2. Auto-Control Engineer and His Team

The project management elects the auto control Engineer. He is always questioned by the site manager and has to do the following things
a. Producing the reasons that justify all the unacceptable works
b. Check the control Engineer's documents.

3. Control Engineer and his Team

He has to perform duties such as checking the site work, in order to keep it coping with the standards, writing all the control documents such as checklist and confirming them, executing all the site quality management decisions and suggestions.

4. Laboratory Control

Laboratory control has to take samples of material and test them in laboratory, Producing monthly test reports in laboratory and sending these reports to the site quality manager

5. Store Control

Store control Documents the materials' movement in and out of the store, produce semi-monthly reports showing the materials' movement from the store to the site. Management documents for proposed site quality management system

1. Weekly Pursuance Table

Each supervisor has to fill a weekly pursuance table. This table is to be submitted to the quality management department in order to check the works against the required standards according to the designs, with the existence of auto-control Engineer.

2. Material Control Certificate

This certificate is used as a document of receiving materials and giving payments to contractors, in order to approve the actual use of materials and site works before giving permission for payment.

3. Monthly Repot of Stocking Materials

This table is filled every fifteen days by the storekeeper who is elected by the project management and by the chief of the store control. This table shows the materials taken from the store and sent to the situations.

4. Engineer Card

This card is given to each supervisor at the site. It explains the quantity of materials received by the supervisor, according to the situations. Each engineer has to keep this card and submit it to the site quality management, when the necessity requires that.

5. Monthly Material Wastage Report

The site quality management fills this table. The percentage of actual waste is determined in order to compare it with the allowable waste.

6. The Monthly Observation Report

The site quality management fills this table in order to determine all the obstacles and defects in the project's requirements like working staff, condition of materials in the project etc.

7. Laboratory Test Report

This document is represented as a monthly table for laboratory tests. In this table, all the laboratory tests are documented with the suggestions of the consultant engineer about the results of the refused tests. The laboratory control engineer and the auto-control engineer fill this table on a monthly basis to be given to the site quality Management.

Conclusion

The research comes out with the following points as the overall conclusion of the research work:

1. Quality management works mean checking and judging site works against the required specifications; before, during and after the completion of the works. When the work is completed, there is another step for evaluating it.
2. Site quality management for construction works does not mean a temporary work, but it shoud be a continuous work during the whole construction period of the project;
3. The construction companies are still suffering from a lack of a system of site quality management. The importance of this system lies in enabling the company to know the quality level of the site works for any project at any time.
4. There is no separate site team that is specialized in quality management in the constructing companies. The constructing team members manage the quality of their works by themselves.
5. The construction site indicated that the main reason of quality fault is poor construction techniques used in construction industry.

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