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QUALITY AUDIT FOR SUSTAINABLE CONSTRUCTION MANAGEMENT

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Abstract: Human's basic needs are food, clothing, and shelter in which shelter has the longest life span. With increasing population, the need of shelters is becoming very intensive as it incorporates enormous resources. Understanding the seriousness of the quality audit for efficiency, efforts are taken worldwide by setting standards like ISO 9000, respective IS codes and practising them to the best possible extent. This paper so put forth the concept of quality audit and gives surround information regarding it clearing the objectives and types of quality audit. Sincere efforts are taken to highlight the key differences among the various types of audits and usefulness of them. Paper elaborates the process of quality audit and proposes the life cycle of it. Thus, complete idea regarding quality audit for construction industry is discussed to the best way possible.

Keywords: ISO 9000, quality audit, materials, construction.



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INTRODUCTION

India shelters about 1.252 billion people with this huge population, there comes a never-ending need of food, clothing, and shelter. One must understand that life expectancy of these shelters is about 50 years and the money invested is high. Any construction project has three vital parameters viz. Cost, Quality, and Time

Due to such parameters, any construction ought to have quality that will ensure the end user that the structure he/she uses is safe and can fulfil his/ her needs. With this, the concept of quality is generated, which can be defined as “degree of excellence”. For ensuring standardisation and quality in the field of construction, India has Indian Standard code, which is identical to ISO 9000: 2008. Such international and national codes are the lights to guide the managers to enhance their works by having sound management strategies to satisfy their customers.

With time the considerations regarding quality has change largely first, it was about specifications and now it is all about customer satisfaction. Quality according to the ISO- 8402 (1994) is as follows “the totality of features and characteristics of a product or services that can bear on its ability to satisfy stated or implied needs”. Quality management system is a complex system of processes, procedures, and methodologies focusing to meet the customer requirements on the continuous basis also known as QMS. The basic feature of this QMS is to develop tools to achieve the stated goal and such tool is Quality Audit.

2. SIGNIFICANCE OF QUALITY AUDIT

An organisation when in business needs to reflect its worth in regards of consistency to demonstrate its ability to provide customer with quality product and fulfil statutory requirements, and for which quality audit is an efficient tool, which will provide this in continual process. Quality of audit is independent of auditor in charge because small auditor if carries the work efficiently it is beneficiary in various aspects. The audit quality can be described in number of manners but consideration should in regards of customer satisfaction, customer loyalty, auditors turn over and most important is auditor’s behaviour and his principles in his work. In the era of globalisation, third party audit is the game changer and has increasing importance irrespective to the field whether it is core construction, repair works, or even regular maintenance works. Construction industry is an industry which demands use of depleting natural resources and huge of money thus in order to make this sustainable, quality audit plays important as it not only guides the contractors but also supports the end user to enjoy the benefits of there investments. Quality of any construction is significantly dependent on man, machine, material and methodology using quality audit will surely curtail cost of construction to a great extend.

3. QUALITY AUDIT

Quality audit can be defined as a tool that examines the work for achieving targeted quality. It is a systematic approach, which not only checks and examines the processes but also certifies the process in various prospective in order to meet the customer needs and satisfaction. Quality Audit is generally done by the personnel which is no in direct responsibility in the area audit is done but working in cooperation with the personnel concerned. Auditing is done by a single person or team with below given objectives.

3.1 Objectives of Quality Audit

Objective behind any audit in construction industry is very important because it directs the team to plan the audit process and makes the process effective and successful. Quality audit have two objectives viz. general and specific, which are discussed below.

General objectives of Quality Audit can be briefed as follows

- i. To evaluate the effectiveness of implemented quality system in order to meet the specified objective
- ii. To conform requirements of customers and stake holders
- iii. To evaluate the issues and providing counter measures for it
- iv. To meet the required standards for the respective jobs
- v. To provide an opportunity to the QMS to improve
- vi. To verify that QMS meets the requirements on the continuous basis

Specific objectives of Quality Audit

- i. To evaluate own quality system against standard quality system
- ii. To check the effectiveness within the frame work
- iii. To evaluate the supplier before entering contractual relationship

With this, one can conclude that Quality Audit is focusing on finding the need for improvement and corrective plan at the same time it is not fault finding but fact-finding process.

3.2 Types of Quality Audit

Any construction company is subjected to two types of auditing viz. Internal and External. Internal audits are done for the evaluation of self and when the organisation does, auditing of other then it is called as External Audit. This phenomenon can be elaborated as below

i. First Party Audit

When a construction firm does self-audit for the purpose of evaluation of any product i.e. project or of the system, it is also known as Internal Audit. The purpose behind it is evaluation of internal quality system and the mechanism. It also suggests the corrective plans for the non-conformities

ii. Second Audit Party

When the construction firm does the audit of supplier (sub-contractor) it is Second Party Audit. It evaluates the capability of the supplier whether it is worth to deal and ability to provide the material and required services. This audit is beneficial to supplier also because it gives complete idea to the supplier that what QMS needs and can know the weakness to improve.

iii. Third Party Audit

Third party audit is done by the team or competent authority who is not responsible to construction company and who are nowhere in the organisational structure. Issue of Quality Certificate can be issued only after the the third party audit is done. Achieving this certificate, it ensures that firm has met all the standard requirements and the owners that the construction firm provides respective construction of consistent quality.

Further, on the basis area of coverage, Audit can be classified as follows

i. Construction System Audit

System Audit can be worked out externally or internally. It is done to evaluate whether the construction company works as per the standard documents (I.S. Codes) and procedures. It also checks whether the products meets the standards and construction firm obligates to fulfil quality system. It evaluates any process which effects the final output.

ii. Construction Process Audit

Process Audit can be done internally or externally. This audit focuses to evaluate the processing and manufacturing processes whether they are according to the standard codes or as documented. This audit is executed during the system audit, it is applicable for the manufacturing industry related to construction.

iii. Construction Product Audit

This audit can be done internally or externally. The purpose in this audit is to ensure that the construction meets the standards specified and to verify whether the structure will satisfy the customer needs. It checks the accuracy of construction equipment, tools and machineries that are used to check the quality. It also works to fulfil all the regulation like environment etc.

4. PROCESS OF CONSTRUCTION QUALITY AUDIT

The process of Construction Quality Audit is peculiar and more or less similar to large extent that holds same for construction industry also. This includes the step wise follow up of each steps in order to achieve the stated fundamental goal. Basic flow chart replicates any standard audit process.

- i. Top Managements lays the needs and goals of construction Quality Audit
- ii. Selection of Audit team and team leader is done
- iii. Team leader notices to the respective construction regarding the upcoming audit
- iv. Team leader and team does the Construction Quality Audit
- v. Team leader completes the audit.

- vi. Analysing the checklist (analysing against the standards) report is drafted.
 - vii. Report copy is sent back to concerned authority.
 - viii. If required corrective action plan is demanded from the organisation
 - ix. Construction firm then prepares corrective action plan and submits it to the team leader
 - x. Verification Audit is done for the corrective action plan by the team and/ or team leader.
- Above procedure is a standard process of Construction Quality Audit and holds true to great extent with minor changes if any. The process can be summarised as below.

4.1 Generic Methodology for Quality Audit at Construction Site

Quality audit program is a set of enormous activities intended to verify the process, techniques and the issues related to fund. Some typical tasks which formulate this audit is discussed below.

- i. Construction Procedure audit
- ii. Construction Equipment audit
- iii. Construction Safety audit
- iv. Construction Labour audit
- v. Construction Material audit
- vi. Subcontract analysis
- vii. Expenditure audit
- viii. Structural audit

4.1.1 Construction Procedure Audit

In this tasks the audit team scrutinizes whether the work is going on in standard ways i.e. according to the IS Code recommendations or at least as documented. This audit is essential because construction fulfils the strength requirement, finishing of the work and quality if only if the work execution is standardised.

4.1.2 Construction Equipment Audit

For this audit team checks the machineries, tools and all the equipments in order to verify whether they are in working condition, do the equipments fulfil the work as per standards and also checks the rent, purchase, maintenances documents related to the equipments.

4.1.3 Construction Safety Audit

In this auditing all the works are analysed on the grounds of safety of labours, and all those who share the site. Team checks the site and verifies the activities according the phase of construction to test the safety practices. This audit not only checks whether the labourers use safety equipments like gloves, goggles during welding, helmets while on height etc but also the work procedure, work execution method is safe or not.

4.1.4 Construction Labour Audit

Labour auditing is very important not only from the labour point of view but also contractor point of view, because in this task the team checks the allotment of labours to the respective works, verifies payroll sheets, checks whether the personnel appointed is doing the same work and also checks individual work records against the payroll records. At the same time, it shows the concern for labour burden and acts accordingly.

4.1.5 Construction Material Audit

This audit is prime audit because not only the material quality is checked but also the inventory assessment is done in the same context. This audit gives complete knowledge of material quality, material strength, and the capital deployed over it. The team verifies the inventory, bills, vouchers and invoice related to material and stock is reviewed. Quality is checked on the basis of various tests and procedures laid down by standard codes.

4.1.6 Subcontract Analysis

In this all the subcontractors are known and the work allotted are understood, accordingly the invoices, bills are checked. Transaction and accounts are checked for the financial status, at the same time the liability of all the subcontractors is observed. Later the receipts are confirmed accordingly.

4.1.7 Construction Expenditure Audit

In this, the team collects all the data related to the expenditure of the owner. Later the bills are segregated and studied to evaluate the cash transactions. Itemized payments are studied for each work and complete payment done to the vendor for respective work is analysed.

4.1.8 Structural Audit

Structural audit is one of the most important audits because it checks the output for which the capital is invested. In this, audit the structural behaviour is checked for which various standard test are used viz. non-destructive test. The motive behind this test is to verify, whether the health of the structure is satisfactory and is safe to use. Checklist during audit plays a key role in analysing the data and helps to meet the objectives of the auditing at the same time guide the auditor making his job smoother and flawless. They are the form that is to be filled in, to know the actual condition and the worth of the respective work. This checklist may differ from organisation to organisation but the objective is to check and analyse the process in respect to make them sustainable and satisfactory for the end user.

5. BENEFITS OF QUALITY AUDIT IN CONSTRUCTION INDUSTRY

- i. Quality Audit gives clarity about customer requirements and assures the customers regarding the quality consistency if the construction firm is certified.

- ii. It also guides the construction firms and other stakeholders to meet standards and fulfil demands of end users. It gives complete idea of responsibilities of the respective department.
- iii. Quality Audit acts as a driving force to achieve standardisation, neatness, and efficient working of any organisation. At the same time, it optimises the man, machine, material, money, consequently complete process.
- iv. Auditing develops transparency in the work done, thus helps to find the gaps and indirectly supports the betterment of the organisation by corrective audits. Moreover, helps the contractors to understand their hidden potential to meet the standards and achieve the ultimate efficiency.

6. CONCLUSIONS

- i. For quality audit systematic record and document, maintenance is mandatory.
- ii. Quality audit identifies good construction practises adopted also ensures that good quality construction have been executed. At the same time highlights the improvement required in management of construction project.
- iii. The process of Construction Quality Audit is teamwork and is a continuous process that goes on and on. It should be noted that audit is a process in which facts are discovered and deciphered to know the reality.
- iv. Construction Quality audit is successful only when the motive and objectives are clear to the audit team.
- v. Audit can be successful only if the process is done efficiently and the actual testing and checklist are precise and strong to meet the aim behind the audit.
- vi. Audit is a tool of quality management system that not only detects process quality but also guides the stakeholders to optimise the processes, and methodology indirectly achieving sustainability.

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