

Performance of Contracting Agencies by Adopting Checklists in Quality Assessment

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Abstract: In order to improve quality in construction industry it is important to understand the factors affecting the quality and analyze these factors in terms of its effects. Better management would result in increased efficiency with reduced quality failures while saving tremendous amount of money. Better management is dependent on the different agencies involved in a project and their attitude towards quality improvement, measurement and efforts taken to achieve quality. The purpose of this paper is to provide information regarding assessment of contractor's performance, from the point of view of achieving quality on site. Checklist fulfills the criteria for quality assurance requirements of construction activities. The checklists are provided as part of the evaluation process for the quality assurance plan.

Keywords: Contractor Performance Assessment, Construction Quality, Quality Improvement and Measurement.

I. Introduction-Importance of Assessing Contractors Performance:

Compliance with quality specifications is an important performance measure of any construction project. The consequences of poor quality can be a loss in productivity; additional expenditure by way of rework and repair; loss of reputation, leading to loss in market share; and eventually being put out of business. Contractor Performance Information aims to ensure a clear record of a contractor's performance on every contract, task order or other contractual document based on a discussion with the contractor about recent performance. Performance assessments will be used as an aid in awarding contracts to contractors that consistently provide quality, on-time products and services that conform to contractual requirements.

According to one of the paper-**Modeling Client Satisfaction Levels: The Impact of Contractor Performance** By Robby Soetanto And David G. Proverbs; University Of Wolverhampton:

The authors stated that- Contractors whose past performance is good are more likely to satisfy their clients. Moreover, health and safety, quality control, and the variations caused by contractors were also found to be of importance. Health and safety is emerging as a significant determinant of client satisfaction. The most important variables indicate that client satisfaction levels are, to some extent, within the 'control' of contractor.

Similarly another paper on **Assessing The Viability Of Total Quality Management Implementation In Contracting Firms Of Pakistani Construction Industry** By Rizwan U. Farooqui, Rehan Masood, Junaid Aziz

According to this paper- It is evident that contractors give only average importance to important issues related to TQM such as quality in the organization, employee training and organizational culture. Contractors usually focus on organizational practices however; these do not tend to reflect in their efforts as the people in key positions do not have a concise and exact definition of quality. In contrary client firms has learnt the importance of TQM but only for cost estimating, warranty claims and project economy. A wide gap has been observed between both stakeholders only because of level of knowledge and awareness about TQM.

II. Objectives and Methodology:

The objectives of the study set were as follows.

- 1) To identify and evaluate various factors affecting the quality performance of construction projects.
- 2) To suggest ways to improve the quality performance of construction projects.

Owing to the non-availability of documented data on completed projects, a questionnaire in form of checklist (ref. Table 1) was considered to find the impacts of various attributes on quality performance. Leading journals and project management textbooks were referred to for this.

2.1 Use of Checklists in Quality Improvement and Measurement:

The quality improvement programs establish actions for achieving the objectives and targets. Quality Improvement is the best possible means to make customer delight by reducing reworks and ultimately reducing the costs associated with it. A typical checklist (verification list) is given below (ref. Table 1). In this checklist,

a list of indicators is included for assessing contractor’s performance. There may be other items missed on this list. This checklist can help contractors to understand their strengths and weaknesses, thus prepare themselves effectively when they consider competing for large construction works and improve the effectiveness of formulating competition strategies. Project clients can also find the results valuable when they consider choosing proper checklists items in a particular project environment to assess ‘contractors’ competitiveness for contractor selection.

Sr. no	Checklist Items	Contractor	
		A	B
1	Were scope and scope responsibilities clearly defined?	√	√
2	Does the contractor's organization have adequate resources?	x	x
3	Does the contractor personnel have enough technical qualification, knowledge and experience to complete the activity	x	x
4	Was the information regarding technical specifications adequate?	√	√
5	Was there consistency between various plan sections (plan view, section, elevations etc.)?	x	√
6	Did the contractor have problems reading or understanding the plans?	√	√
7	Identify reoccurring problems – resolved or unresolved.	x	x
8	Has the contractor appointed a supervisor who has the responsibility to ensure that quality norms are implemented, and maintained in accordance with the specification?	√	√
9	Efforts to prevent the occurrence of any nonconformities relating to quality issues?	x	x
10	Analysis of the root cause of the nonconformity relating to quality?	x	x
11	Does the contractor personnel have enough technical qualification, knowledge and experience to complete the activity	x	x
12	The contractor conducts regular site safety inspections and records of the inspections are available	√	x

Table1. Checklist for assessing Contractors performance

Note: √ sign is interpreted as contractors satisfy the checklist item while x sign indicates that contractors are not able to give satisfying results.

2.2 Data analysis:

The finding of the checklists indicates that, quality management in construction projects needs to be strengthened and there are problems in relation to contractor’s quality management implementation that require attention. Quality control in construction is process of verifying that errors are within tolerance allowable by standard and that the finished project meets with the quality standard.

On construction sites, subcontractors have specific responsibilities. Supervisors and project managers try to maintain high quality standards but they can’t be everywhere at once. Contractors have a person, someone who is responsible for going through the building or project, ensuring compliance and maintaining an ongoing list of corrective items that must be accomplished before the contractor who installed it is paid or leaves the job.

Data focuses on developing answer to the underlying question that was considered to be central to the study:

Why have project experienced significant quality-related problems on account of contractor A & B?

- (1) Inadequate staffing for the project, in numbers, in qualifications, and in applicable experience.
- (2) Selection of contractors who may have been used successful in small projects but who had very limited experience in high rise structures.
- (3) Over-reliance on the same contractors in managing the project and evaluating its progress.
- (4) Use of contracts that emphasized cost and schedule to the detriment of quality.
- (5) Lack of management commitment to and understanding of how to achieve quality
- (6) Lack of management support for the quality program.
- (7) Lack of adherence to is specifications.
- (8) Inability to recognize that recurring problems in the quality of construction were indications of severe problems.

III. Case Study: Pittie Kourtyard At Kharadi

3.1 Project Details:

- a) **Name of the Project:** “Construction of Residential High Rise Towers.
- b) **Client:** Raja Bahadur International Limited.
- c) **Quality Consultant:** CQRA
- d) **Architect:** Rajeev Sathe
- e) **Contractor:** For RCC works, Sai Deep Enterprises- A&C BLDG
Mr. Takwale-B BLDG
- f) **Type of Contract:** Item rate contract.
- g) **Present Status of Project:** For RCC work completion of Buildings is as follows
- h) A-45% B-40% C-35%
- i) **Location of the Site:** Site is located near Pune Airport, Kharadi, Maharashtra, India.

3.2 Advanced Technical Features:

- a) Gas Leak Detector & Controller
- b) Environment friendly green building registered with IGBC.
- c) Vastu principles incorporated.
- d) Earthquake resistant RCC frame structure.
- e) 3 high speed elevators including 1 stretcher lift
- f) Vehicle free garden podium
- g) Eco friendly waste management system and sewage treatment plant.

3.3 Contractors Obligation:

The contractor’s obligation is to carry out and complete the works in a proper workmanlike manner. The contractor must carry out the works with required skill, to the satisfaction of the client.

3.4 Third Party Inspection By CQRA:

In addition to the contractor’s own quality control measures, a third party inspection team working on behalf of the client, inspect the contractor’s works to verify compliance with the specifications. In order to achieve quality on site, some frameworks are used by CQRA (Construction quality rating agency) on this project. The details of frameworks are given in Fig 1 & 2 below:

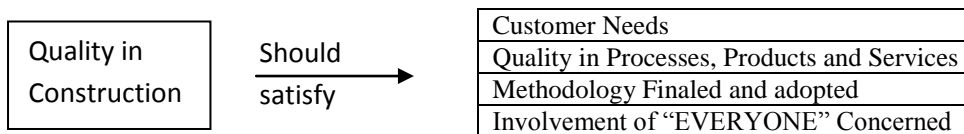


Fig. 1: Quality in Construction.

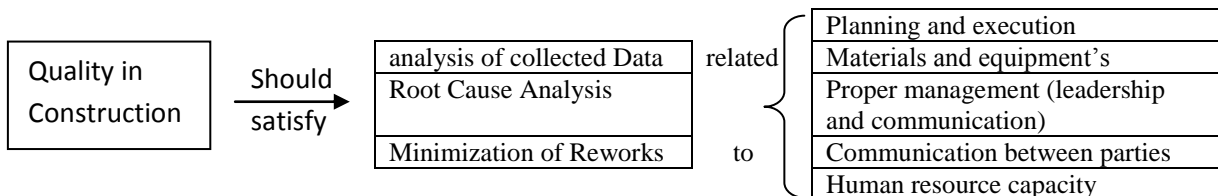


Fig. 2: Quality in Construction.

By adopting above frameworks, contractors work is again analyzed by CQRA using checklists in specialized formats, sample of which is as given below. A typical checklist for “external plaster works” is as given below in Table2. The following checklist provides a list of all items that need to be considered as part of the complete step by step evaluation of an activity.

Checklist For External Plaster			
Sr. No	Equipment And Tools	Checked	Remark
1	Necessary Tools Available With Masons		
2	Mechanical Mixer Used For Mixing Mortar		
3	Double Scaffolding Used As Specified		
4	Safety Equipments Used As Specified		
Procedure Before Work			
1	14 Days Gap Between Masonry And Plaster		
2	Masonry Surface Cleaned As Specified		
3	Sequence Of Plastering Decided In Advance		
4	Scaffolding Material Checked And Erected As Specified		
5	Beam Bulges Chipped Off		
6	Gaps In Brickwork Filled From Outside 2days In Advance As Specified		
7	Wetting Of Brick Surface Done As Specified		
8	Protection Against Drying/ Wind Provided As Specified		
9	Level Pads Taken/ Line Doris Stretched As Specified		
10	Chicken Mesh/ Fiber Mesh Fixed At BBM And Concrete Joints As Specified		
11	Coping To Sills Of Windows And Parallel Top Complete		
12	Drain Spouts Fixed In External Box Type Structures/ Toilet Sunk		
13	Plumbing Pipe Holes Made And Finished As Specified		
Procedure During Work			
1	Mortar Preparation And Dosage Of Admixture As Specified		
2	Mortar Preparation In Mechanical Mixer As Specified		
3	Mortar Used Within 90 Min. Of Preparation		
4	Water-Proofing Compound Added As Specified		
5	Thickness Of First Coat Kept Max. 15mm		
6	Thickness Of Second Coat Kept Max. 8mm		
7	Time Gap/ Curing/ Application Of Bonding Agent Between Two Coats As Specified		
9	Max. Gap Between 2 Coats Kept 5 Days Or Bonding Agent Used		
10	Panipatti Provided As Specified		
11	Chajja Top Plaster Merged Inside With External Plaster		
12	Finishing Of Plaster Done As Specified		
13	Plaster Taken Over Parapet Wall Inside Terrace Without Joint		
14	Plaster Joints Kept At Centre Of Beams		
Procedure After Work			
15	Cleaning Of Frames/ Other Surfaces Done As Specified		
16	Date Of Plastering Marked For Monitoring Curing		
17	Curing Carried Out For 7days As Specified		
18	Parapet Top Given Inside Slope As Specified		
19	Window Sills Finished As Per Drawing		
20	Roughening Of Plaster Surface Done Where Tiles Are To Be Fixed		

Table2: Checklist for External Plaster Works

Note: Checklist items marked with \checkmark are termed as “Conformities” while items marked with X are termed as “Non-Conformities”.

IV. Conclusion:

By adopting the above frameworks, we have observed that, quality in construction is maintained high. In cases of occurrence of non-conformities, they are corrected and some non-conformity is mitigated by adopting preventive measures for each item in specialized formats.

The completed checklist is a confirmed record of the high quality of construction works. This record can be offered to the homebuyer as an important assurance of quality. Include the completed checklist in a homeowner manual that contains other important documents.

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