

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, ISO 9001

I. INTRODUCTION

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

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.

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. PROBLEM STATEMENT

A. Study Area 1- Pebbles Urbania

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	Arcon6990aharashtr
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

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

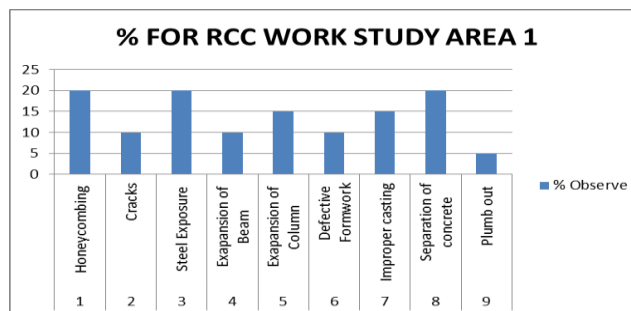
III. RESULT AND DISCUSSION

A. ANALYSIS FOR RCC DEFECTS

- For Study Area 1

Table 3 For RCC Defects Study Area 1

FOR RCC WORK		
SR NO	FACTORS	% OBSERVE
1	Honeycombing	20
2	Cracks	10
3	Steel Exposure	20
4	Expansion of Beam	10
5	Expansion of Column	15
6	Defective Formwork	10
7	Improper casting	15
8	Separation of concrete	20
9	Plumb out	5



Graph 1 ForRcc Defects Study Area 1

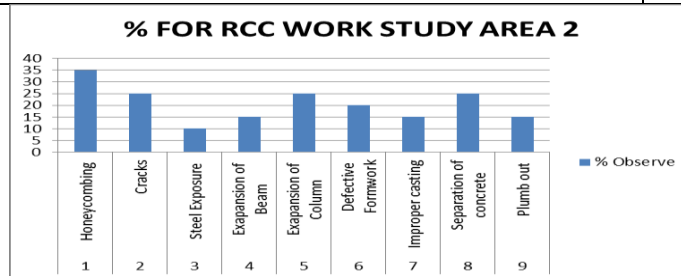


After Following Above Check List Its Observe That RCC Work On Site Pebbles Urbenia , The Defects In Quality Management Of RCC Work Are Around 13%

• For Study Area 2

Table 4 for RCC Defects Study Area 2

FOR RCC WORK		
SR NO	FACTORS	% OBSERVE
1	Honeycombing	35
2	Cracks	25
3	Steel Exposure	10
4	Expansion of Beam	15
5	Expansion of Column	25
6	Defective Formwork	20
7	Improper casting	15
8	Separation of concrete	25
9	Plumb out	15



Graph 2 For RCC Defects Study Area 2

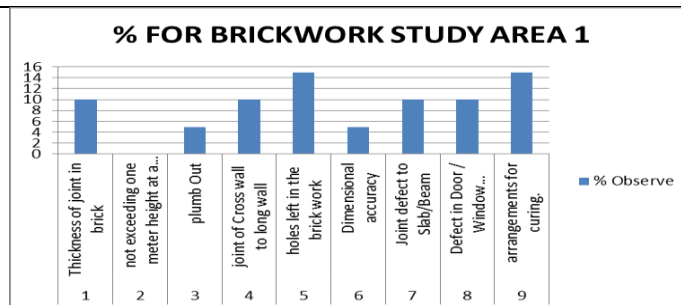
After following above check list its observe that RCC work on site Pride Purple Square, the defects in quality management of RCC work are around 25%

B. FOR BRICKWORK DEFECTS

• For Study Area 1

Table 5 For Brickwork Defects Study Area 1

FOR BRICKWORK		
SR NO	FACTORS	% OBSERVE
1	Thickness Of Joint In Brick	10
2	Not Exceeding One Meter Height At A Time	0
3	Plumb Out	5
4	Joint Of Cross Wall To Long Wall	10
5	Holes Left In The Brick Work	15
6	Dimensional Accuracy	5
7	Joint Defect To Slab/Beam	10
8	Defect In Door / Window Dimensions	10
9	Arrangements For Curing.	15



Graph 3 For Brickwork Defects Study Area 1

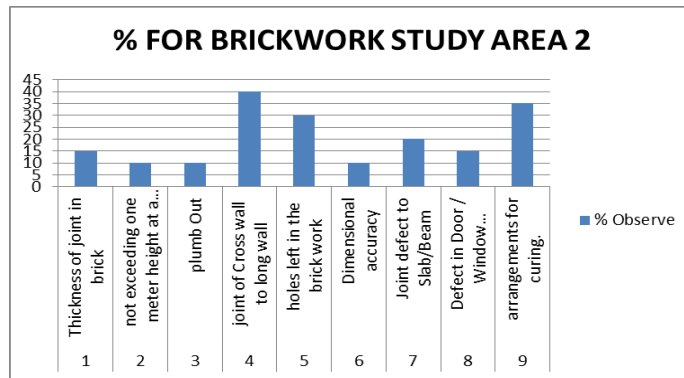


After following above check list its observe that Brickwork on site Pebbles Urbenia , the Brickwork Defects in quality management of Brickwork are around 9%

• For Study Area 2

Table 6 for Brickwork Defects Study Area 2

FOR BRICKWORK		
SR NO	FACTORS	% OBSERVE
1	Thickness Of Joint In Brick	15
2	Not Exceeding One Meter Height At A Time	10
3	Plumb Out	10
4	Joint Of Cross Wall To Long Wall	40
5	Holes Left In The Brick Work	30
6	Dimensional Accuracy	10
7	Joint Defect To Slab/Beam	20
8	Defect In Door / Window Dimensions	15
9	Arrangements For Curing.	35



Graph 4 for Brickwork Defects Study Area 2

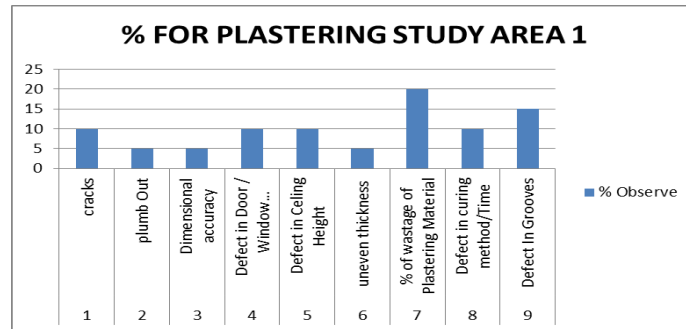
After following above check list its observe that Brickwork on site Pride Purple Square, the Brickwork Defects in quality management of Brickwork are around 21%

C. FOR PLASTERING DEFECTS

• For Study Area 1

Table 7 for Plastering Defects Study Area 1

FOR PLASTERING		
SR NO	FACTORS	% OBSERVE
1	Cracks	10
2	Plumb Out	5
3	Dimensional Accuracy	5
4	Defect In Door / Window Dimensions	10
5	Defect In Ceiling Height	10
6	Uneven Thickness	5
7	% Of Wastage Of Plastering Material	20
8	Defect In Curing Method/Time	10
9	Defect In Grooves	15



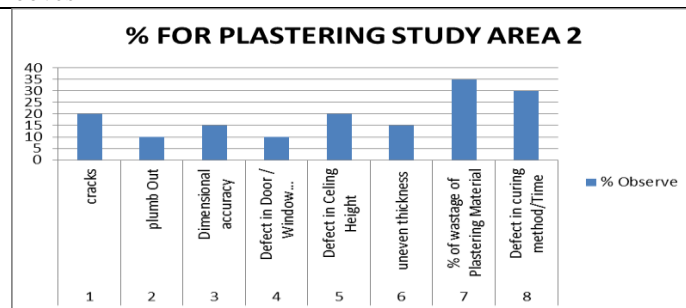
Graph 5 for Plastering Defects Study Area 1

After following above check list its observe that Plastering work on site Pebbles Urbenia , the Plastering Defects in quality management are around 10%

• For Study Area 2

Table 8 for Plastering Defects Study Area 2

FOR PLASTERING		
SR NO	FACTORS	% OBSERVE
1	Cracks	20
2	Plumb Out	10
3	Dimensional Accuracy	15
4	Defect In Door / Window Dimensions	10
5	Defect In Ceiling Height	20
6	Uneven Thickness	15
7	% Of Wastage Of Plastering Material	35
8	Defect In Curing Method/Time	30
9	Defect In Grooves	25



Graph 6 for Plastering Defects Study Area 2

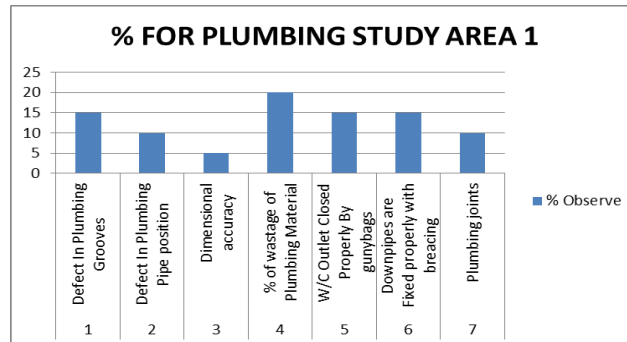
After following above check list itsobserve that Plastering work on site Pride Purple Square, the Plastering Defects in quality management are around 20%

D. FOR PLUMBING DEFECTS

• For Study Area 1

Table 9 For Plumbing Defects Study Area 1

FOR PLUMBING		
SR NO	FACTORS	% OBSERVE
1	Defect In Plumbing Grooves	15
2	Defect In Plumbing Pipe position	10
3	Dimensional accuracy	5
4	% of wastage of Plumbing Material	20
5	W/C Outlet Closed Properly By gunnybags	15
6	Downpipes are Fixed properly with bracing	15
7	Plumbing joints	10



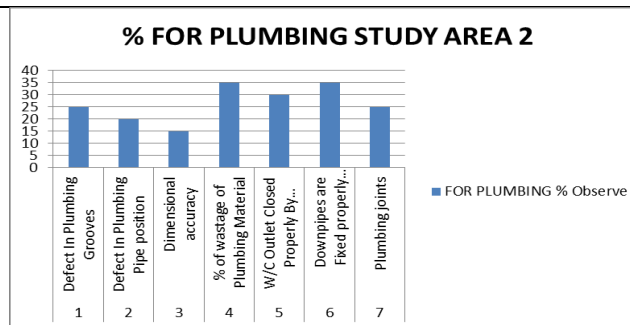
Graph 7 For Plumbing Defects Study Area 1

After following above check list its observe that Plumbing work on site Pebbles Urbenia , the Plumbing Defects in quality management are around 13%

• For Study Area 2

Table 10 For Plumbing Defects Study Area 2

FOR PLUMBING		
SR NO	FACTORS	% OBSERVE
1	Defect In Plumbing Grooves	25
2	Defect In Plumbing Pipe position	20
3	Dimensional accuracy	15
4	% of wastage of Plumbing Material	35
5	W/C Outlet Closed Properly By gunnybags	30
6	Downpipes are Fixed properly with bracing	35
7	Plumbing joints	25



Graph 8For Plumbing Defects Study Area 2

After following above check list itsobserve that plumbing work on site Pride Purple Square, the Plumbing Defects in quality management are around 28%

IV. CONCLUSION

- Poor quality in design and construction affects the maintenance cost and level of service of the project. The consultants and contractors should take some proactive measures in order to improve the quality in the design and execution phase of construction projects.
- In thesis we studied two case studies Pebbles Urbenia and Pride Purple Square. From both case study only Pebbles Urbenia are follow ISO 9001,so results of defects in quality of work for Pebbles Urbenia are less than the Pride Purple Square.so its conclude that follow ISO 9001 is beneficial from point of view of quality management . the results for both case studies are as given
- After following check list its observe that RCC work on site Pebbles Urbenia , the defects in quality management of RCC work are around 13%
- After following check list its observe that RCC work on site Pride Purple Square, the defects in quality management of RCC work are around 25%

- After following check list its observe that Brickwork on site Pebbles Urbenia , the Brickwork Defects in quality management of Brickwork are around 9%
- After following check list its observe that Brickwork on site Pride Purple Square, the Brickwork Defects in quality management of Brickwork are around 21%
- After following check list its observe that Plastering work on site Pebbles Urbenia , the Plastering Defects in quality management are around 10%
- After following check list its observe that Plastering work on site Pride Purple Square, the Plastering Defects in quality management are around 20%
- After following above check list its observe that Plumbing work on site Pebbles Urbenia , the Plumbing Defects in quality management are around 13%
- After following above check list its observe that plumbing work on site Pride Purple Square, the Plumbing Defects in quality management are around 28%

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