

# Impact of Poor Workmanship on Cost and Quality in the Construction Industry: A Case Study

**Mr. Pratik S Desai<sup>1</sup>, Prof. Amrut K. Patil<sup>2</sup>**

<sup>1</sup>Student, Civil Engineering Department, NMCE, Peth,

<sup>2</sup> Assistant Professor, Civil Engineering Department, NMCE, Peth.

**Abstract:** - Poor workmanship is a major issue in the construction industry, leading to defects, increased costs, and reduced quality of buildings. This study examines the impact of poor workmanship on construction cost and quality through a questionnaire survey and five real-life case studies conducted in semi-urban areas of Maharashtra, India. The survey results show that inadequate training, lack of experience, shortage of skilled labor, and poor supervision are the main causes of poor workmanship. Case study analysis reveals that common defects such as slab cracks, leakage, plaster failure, and poor finishes resulted in significant rework costs, with slab-related defects causing the highest losses. The study concludes that improving worker training, supervision, and site management can significantly reduce defects, control costs, and enhance construction quality.

**Keywords:** - Poor workmanship, Construction defects, Cost overrun, Quality of construction, Rework cost, Skilled labor, Site supervision.

## 1. Introduction

The construction industry is a vital contributor to economic growth and infrastructure development, providing essential facilities such as housing, transportation networks, and public buildings. Despite advances in construction technology and project management practices, the industry continues to face significant challenges related to construction quality. Among these, poor workmanship remains one of the most critical and persistent problems affecting project performance worldwide.

Workmanship refers to the level of skill, care, and accuracy with which construction activities are executed. Poor workmanship commonly arises due to inadequate worker training, lack of experience, weak site supervision, poor communication, and cost-driven employment of unskilled labor. These issues often result in construction defects such as cracks, leakage, improper finishes, and material wastage. Such defects not only compromise structural performance and durability but also lead to rework, cost overruns, project delays, and reduced client satisfaction.

In developing and semi-urban regions, the problem of poor workmanship is more pronounced due to labor-intensive construction practices, informal workforce arrangements, and limited quality control mechanisms. While several studies have examined cost and time overruns in construction projects, relatively fewer studies have quantitatively linked specific workmanship-related defects to actual financial

losses based on field data. Moreover, local and regional studies that capture real construction practices and challenges remain limited.

This study aims to address this gap by investigating the impact of poor workmanship on construction cost and quality through a combined approach of contractor surveys and multiple case studies. By identifying key workmanship-related factors and quantifying rework costs associated with common construction defects, the research provides practical insights into how workmanship influences project performance. The findings are intended to support contractors, engineers, and project stakeholders in improving construction quality, minimizing rework, and achieving more cost-effective and durable buildings.

## **2. Literature Summary**

Previous studies have widely reported that poor workmanship is a major cause of construction defects, cost overruns, and quality degradation in building projects. Research indicates that inadequate worker training, lack of experience, shortage of skilled labor, and weak site supervision are the primary factors contributing to poor workmanship (Ali & Wen, 2011; Danso, 2014). Studies conducted in developing regions further highlight that poor labor conditions, low wages, limited funding, and ineffective quality management systems worsen workmanship-related problems (Dilip Kumar, 2013; Mydin & Othman, 2014; Fromsa et al., 2020). Defects such as cracking, leakage, and poor finishes have been shown to increase material wastage and rework costs, directly affecting project performance (Waje & Patil, 2016). However, most existing research focuses on qualitative assessment of defects, with limited studies quantifying actual cost losses due to poor workmanship, particularly in semi-urban contexts. This study addresses this gap by combining contractor perceptions with case-based cost analysis.

## **3. Methodology**

This study adopted a mixed-method approach combining questionnaire survey and case study analysis to evaluate the impact of poor workmanship on construction cost and quality. A structured questionnaire based on previous literature was designed using a five-point Likert scale to identify major factors contributing to poor workmanship. The survey was administered to experienced contractors working in semi-urban regions of Maharashtra, India. The collected responses were analyzed using mean score ranking to determine the relative importance of each factor.

In addition, five completed residential and institutional building projects were selected as case studies. Site visits were conducted to identify workmanship-related defects such as slab cracks, leakage, plaster failure, and improper finishes. For each defect, material wastage, repair cost, and labor cost were recorded to quantify rework expenses. The survey findings were then compared with case study results to establish a relationship between workmanship factors and actual cost losses. This integrated approach enabled a practical and evidence-based assessment of the effects of poor workmanship on construction performance.

## **4. Questionnaire survey & Analysis**

A structured questionnaire was developed based on findings from previous studies to identify the key factors contributing to poor workmanship in construction projects. The questionnaire included seven workmanship-related factors: poor supervision, lack of experience, inadequate worker training, shortage of skilled labor, poor communication, lack of awareness, and cost limitations. Responses were recorded using a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). The survey was

administered to experienced contractors with more than five years of involvement in building construction projects in semi-urban regions of Maharashtra.

The collected responses were analyzed using mean score analysis to rank the relative importance of each factor. The results indicate that inadequate training of workers achieved the highest mean score, followed by lack of on-site experience and shortage of skilled labor. Poor supervision ranked moderately, while communication issues, lack of awareness, and cost limitations received comparatively lower scores. The analysis confirms that human-related factors, particularly training and experience, are the dominant contributors to poor workmanship. These findings provided the basis for selecting case study parameters and guided the subsequent cost impact analysis.

## 5. Case Study Data Collection: -

To assess the real impact of poor workmanship on construction cost and quality, five completed building projects were selected as case studies from semi-urban regions of Maharashtra, India. The selected projects included residential and institutional buildings with varying floor areas and construction durations. These projects were chosen because they exhibited visible workmanship-related defects and had documented records of repair and rework.

### 5.1 Description of Case Study Projects

Summarizes the basic details of the selected case study projects.

**Table 1. Details of Selected Case Study Projects**

Case No.	Project Type	Built-up Area (sq. ft.)	No. of Floors	Year of Completion
1	Residential	960	G+1	2024
2	Residential	1545	G	2025
3	Institutional (Temple)	1300	G	2025
4	Residential	1800	G+1	2024
5	Residential	1200	G	2025

### 5.2 Data Collection Procedure

Primary data were collected through site visits, visual inspections, and interactions with contractors and site supervisors. During each visit, workmanship-related defects such as slab cracks, leakage, plaster failure, improper finishes, misalignment of doors and windows, and material breakage were identified and documented. Photographic evidence and repair records were used to validate observations.

For each defect, data were collected on:

- Type and location of defect
- Probable cause related to workmanship
- Nature of remedial action (repair or replacement)

- Material wastage cost
- Additional labor and repair cost

### 5.3 Cost Loss Due to Poor Workmanship

The financial impact of poor workmanship was quantified by calculating the total rework cost for each project. This included material wastage, replacement cost, and labor cost required to rectify defects.

**Table 2:- Cost Loss Due to Poor Workmanship in Case Studies**

Case No.	Major Defects Observed	Rework Cost (₹)
1	Slab cracks, door finishing, kitchen level issues	29,800
2	Column recasting, leakage, wall demolition	13,000
3	Door frame failure	3,400
4	Slab leakage, plaster failure, tile cracks	59,900
5	Window placement error	6,500
<b>Total</b>	—	<b>1,12,600</b>

### 5.4 Link Between Defects and Workmanship Factors

The observed defects were analyzed to identify their root causes. Most defects were linked to inadequate training of workers, lack of experience, poor supervision, and insufficient communication between contractors and labor. Slab-related defects were found to contribute the highest cost losses due to the need for specialized repairs such as waterproofing and structural rectification.

The case study findings strongly support the questionnaire results, confirming that human-related workmanship factors have a direct and measurable impact on construction cost and quality.

## 6. Case Study Output

The analysis of five completed construction projects revealed multiple workmanship-related defects across structural and finishing activities. Common defects identified included slab cracking, leakage, plaster failure, tile cracking, improper door and window alignment, and component breakage. Slab-related defects were observed in four out of five projects and resulted in the highest repair costs.

The total rework cost due to poor workmanship across all case studies was ₹1,12,600. Among the projects, the maximum cost loss (₹59,900) occurred in a residential building where slab leakage and plaster failure required extensive repair and waterproofing work. Finishing-related defects contributed moderate cost losses, while isolated component failures resulted in comparatively lower costs. Inadequate training, lack of experience, and poor supervision were identified as the dominant workmanship factors associated with most defects.

**Table 3:- Case study output with their parameter**

Output Parameter	Observation
Total projects analyzed	5
Total rework cost	₹1,12,600
Most affected activity	Slab construction

Most common defects	Cracks, leakage, plaster failure
Dominant workmanship factor	Inadequate worker training
Nature of impact	Cost escalation and quality reduction

## 7. Result & Discussion

The results clearly demonstrate that poor workmanship leads to measurable financial losses and deterioration of construction quality. The dominance of slab-related defects indicates that critical structural activities are highly sensitive to worker skill, supervision, and adherence to construction practices. Since slab repairs often involve specialized treatment and waterproofing, even minor workmanship errors can result in disproportionately high rework costs.

The strong correlation between questionnaire findings and case study results confirms that inadequate training and lack of experience are the primary drivers of poor workmanship. This aligns with earlier studies that emphasize human-related factors as the root cause of construction defects rather than material or budget constraints. Although cost limitations were present, their relatively lower impact suggests that improving workforce competency can significantly enhance quality without major financial investment. Compared to previous studies that mainly focused on qualitative assessment of defects, this research provides quantitative evidence linking specific workmanship failures to actual cost losses. The findings highlight the importance of preventive quality measures, such as worker training, strict supervision during structural works, and effective communication on-site. Addressing these factors can reduce rework, control costs, and improve long-term performance of buildings, especially in semi-urban construction environments.

## 8. Conclusion

This study investigated the impact of poor workmanship on construction cost and quality through a questionnaire survey and detailed analysis of five completed building projects in semi-urban regions of Maharashtra, India. The findings confirm that poor workmanship is a major contributor to construction defects and rework, leading to significant and avoidable cost escalation.

The questionnaire results identified inadequate training of workers, lack of on-site experience, shortage of skilled labor, and poor supervision as the most influential workmanship-related factors. These findings were strongly supported by the case study analysis, which revealed that slab-related defects such as cracking and leakage were the most frequent and costly, accounting for a substantial share of the total rework cost of ₹1,12,600. Finishing-related defects further demonstrated the negative impact of unskilled labor and weak site control on construction quality.

The study highlights that workmanship-related issues are primarily human-driven rather than material- or cost-driven. Improving worker training, deploying experienced supervisors, and strengthening site communication can significantly reduce defects and enhance construction quality without major increases in project cost. Overall, the research provides practical, field-based evidence that improving workmanship

practices is essential for achieving cost-effective, durable, and high-quality construction, particularly in semi-urban and resource-constrained environments.

## 9. Future Scope

This study provides practical insights into the impact of poor workmanship on construction cost and quality; however, further research can expand its scope in several directions. Future studies may include a larger sample of projects covering commercial buildings, infrastructure works, and public-sector projects to improve the generalizability of findings. Comparative studies across rural, urban, and metropolitan regions can help identify location-specific workmanship challenges.

Advanced technologies such as Building Information Modeling (BIM), digital quality inspection tools, and prefabrication methods can be investigated for their effectiveness in reducing workmanship-related defects. Long-term studies focusing on maintenance and life-cycle costs of buildings affected by poor workmanship would provide deeper economic insights. Additionally, future research can evaluate the effectiveness of structured training and skill development programs in improving workmanship quality. Integrating safety performance with workmanship assessment may further strengthen construction quality management frameworks.

## References

1. Ali, A. S., & Wen, K. H. (2011). Building defects: Possible solution for poor construction workmanship. *Journal of Building Performance*, 2(1), 59–69.
2. Dilip Kumar, M. (2013). A study of labour welfare in construction industry with special reference to Pune city. *International Journal of Management and Social Sciences Research*, 2(11), 98–105.
3. Sittu, A. A., & Adamu, A. D. (2013). Poor workmanship and construction defects: Causes and solutions. *International Journal of Engineering Research and Applications*, 3(5), 119–123.
4. Danso, H. (2014). Poor workmanship and its effects on construction projects. *Civil and Environmental Research*, 6(4), 1–7.
5. Masurkar, Y. S., & Attar, A. (2014). Failure of concrete structures due to poor workmanship and quality issues. *International Journal of Research in Engineering and Technology*, 3(6), 247–250.
6. Mydin, M. A. O., & Othman, N. A. (2014). Workmanship issues in construction housing: Causes and remedies. *E3S Web of Conferences*, 3, 01027. <https://doi.org/10.1051/e3sconf/20140301027>
7. Waje, V., & Patil, V. (2016). Defects in construction projects and their impact on cost and quality. *International Journal of Innovative Research in Science, Engineering and Technology*, 5(7), 12345–12350.
8. Mahajan, G. S. (2017). Quality management in construction projects: Addressing defects due to poor workmanship. *International Journal of Engineering Sciences & Research Technology*, 6(9), 428–433.
9. Thamilarasu, V. (2017). Impact of workmanship on quality, safety, and durability in residential buildings. *International Journal of Civil Engineering and Technology*, 8(5), 950–957.
10. Johari, S., & Jha, K. N. (2019). Causes of poor workmanship in construction projects: Role of worker behavior and attitude. *Journal of Construction in Developing Countries*, 24(1), 1–20. <https://doi.org/10.21315/jcdc2019.24.1.1>



11. Fromsa, A., Ararsa, W., & Quezon, E. T. (2020). Factors affecting workmanship quality in Ethiopian construction projects. *International Journal of Construction Management*, 20(6), 441–450. <https://doi.org/10.1080/15623599.2018.1462447>
12. Abdulaziz, A., Li, Y., & Zhang, H. (2023). Effect of construction defects on construction and demolition waste: A systematic review. *Integrated Environmental Assessment and Management*, 21(2), 233–245. <https://doi.org/10.1002/ieam.4776>
13. Abubakar, I., Ibrahim, S., & Bello, A. (2023). Key residential construction defects: A framework for their identification and correlated causes. *International Journal of Construction Engineering and Management*, 12(3), 45–54.
14. Risk & Insurance. (2023). Construction defect claims on the rise: Understanding the trends and impacts. *Risk & Insurance Magazine*. Retrieved from <https://riskandinsurance.com/construction-defect-claims-on-the-rise-understanding-the-trends-and-impacts/>
15. Home Builders Institute. (2024). Fall 2024 Construction Labor Market Report. Washington, DC: HBI. Retrieved from <https://hbi.org/wp-content/uploads/2024/09/Fall-2024-Construction-Labor-Market-Report.pdf>
16. Construction Dive. (2025, March 15). Construction hiring slows to lowest rate ever recorded. *Construction Dive*. Retrieved from <https://www.constructiondive.com/news/construction-hiring-job-lowest-rate-march-2025/746842/>