Journal of Architectural Research and Development, 2023, Volume 7, Issue 2
http://ojs.bbwpublisher.com/index.php/JARD
ISSN Online: 2208-3537
ISSN Print: 2208-3529

Analysis of Building Construction Quality Control and Safety Management

Shiwei Sun*

China Railway First Bureau Group Co., Ltd. Guangzhou Branch, Guangzhou 511492, Guangdong Province, China

***Corresponding author:** Shiwei Sun, 695804794@qq.com

Abstract: Quality control and safety management are two very important contents in building construction project management. Once the construction quality is not up to standard or a safety accident occurs, the economic benefits of the project will be severely impacted. However, there are still some problems in the quality and safety management of the project. In this paper the problems in construction quality control and safety management are analyzed, and effective countermeasures are put forward, in hopes to help improve construction quality and safety.

Keywords: Building construction; Quality control; Construction safety

Online publication: March 30, 2023

1. Introduction

With the continuous development of society, the construction industry is also booming, and the scale of construction projects is also increasing. When quality issues or safety accidents occur in the construction on a building, not only will the progress of the project be affected, but also the image and development of the construction company. Especially in such a fiercely competitive market, it is all the more necessary to pay attention to the quality control and safety management of building construction.

2. Problems in quality control and construction safety management of building construction

2.1. Lack of management from construction companies

Many construction companies do not pay enough attention to quality control and safety management during the construction process, so the management system is flawed and does not take basic characteristics of building construction into consideration, leading to the failure of controlling dangerous segments of building construction. Moreover, some management personnel lack sense of responsibility, thus they fail to perform their tasks and investigate safety hazards in the construction of the project, and fail to correctly deal with problems that arises, which leads to quality and safety issues.

2.2. Factors affecting construction quality and construction safety

The construction period of most projects is relatively long, and the construction process is relatively complicated, and there are many factors that may affect the construction quality and safety. Generally, construction materials occupy a relatively large proportion of the construction costs. Therefore, some construction companies will try to cut costs by purchasing subpar materials, which will not only affect the construction quality, but also increase hidden dangers of the project. Nowadays, many large-scale machinery and equipment are used in the construction of a building, which poses certain risks. Safety

accidents are prone to occur if the management or maintenance of construction machinery and equipment is neglected in order to complete the project in time. In addition, some companies employ migrant workers to save labor costs and maximize economic benefits. However, most migrant workers lack professional knowledge and skills, and safety awareness, which will in turn affect the construction quality and construction of a project.

3. Effective strategies for quality control and safety management in building construction

3.1. Outlining the content of quality control

To prevent quality issues and fully execute construction quality control, it is necessary to formulate a clear quality control system in the pre-construction, construction, and post-construction periods, as shown in **Figures 1**, **2**, **and 3**, and strictly implement them.

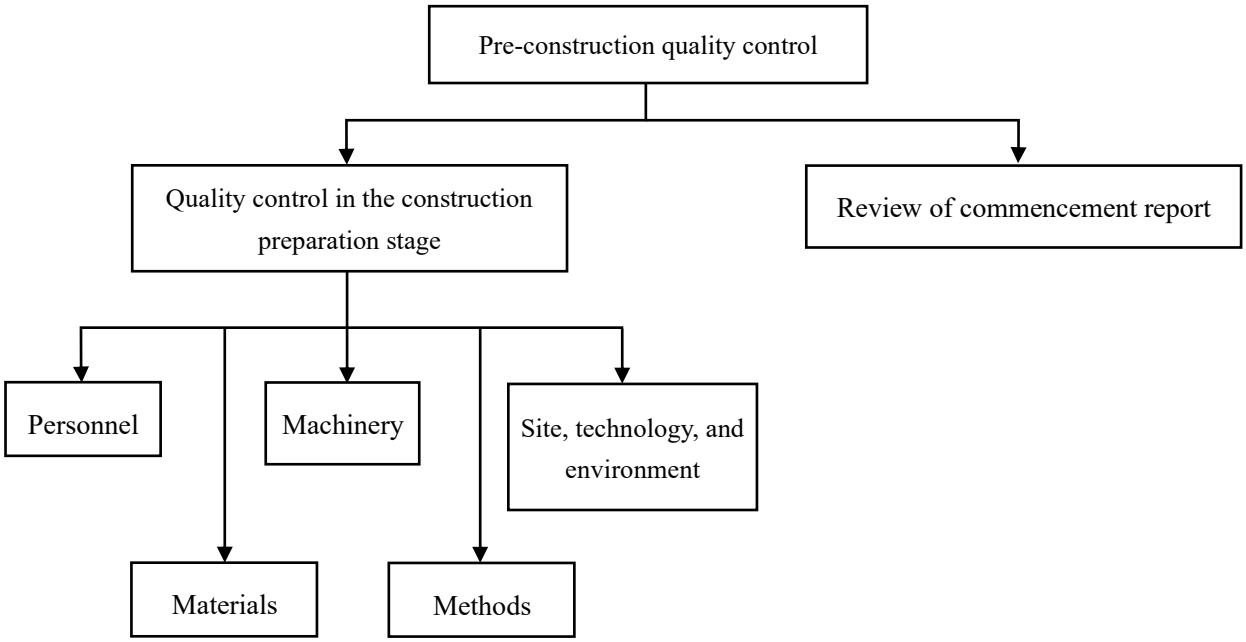

Figure 1. Prior control process of project construction quality

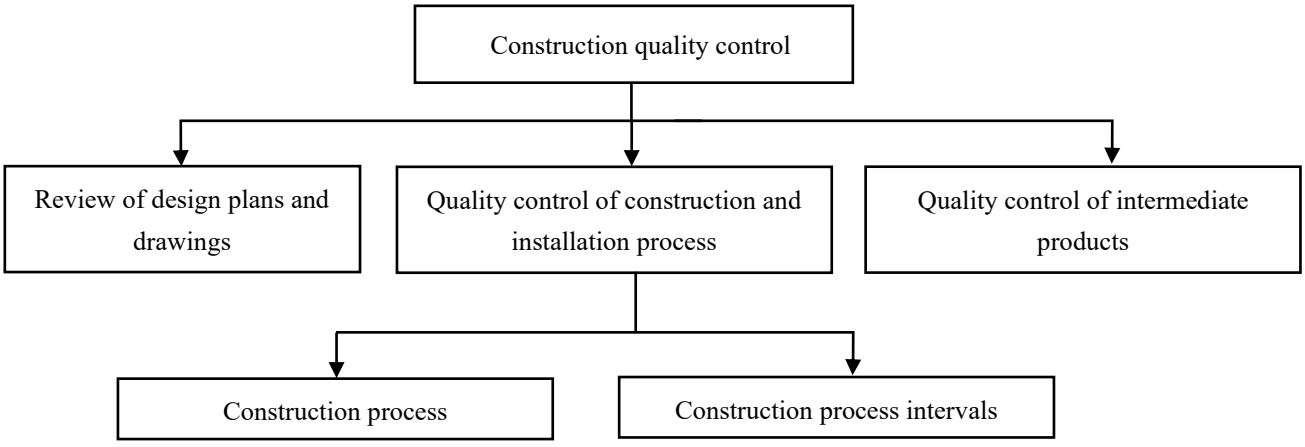

Figure 2. In-process control of project construction quality

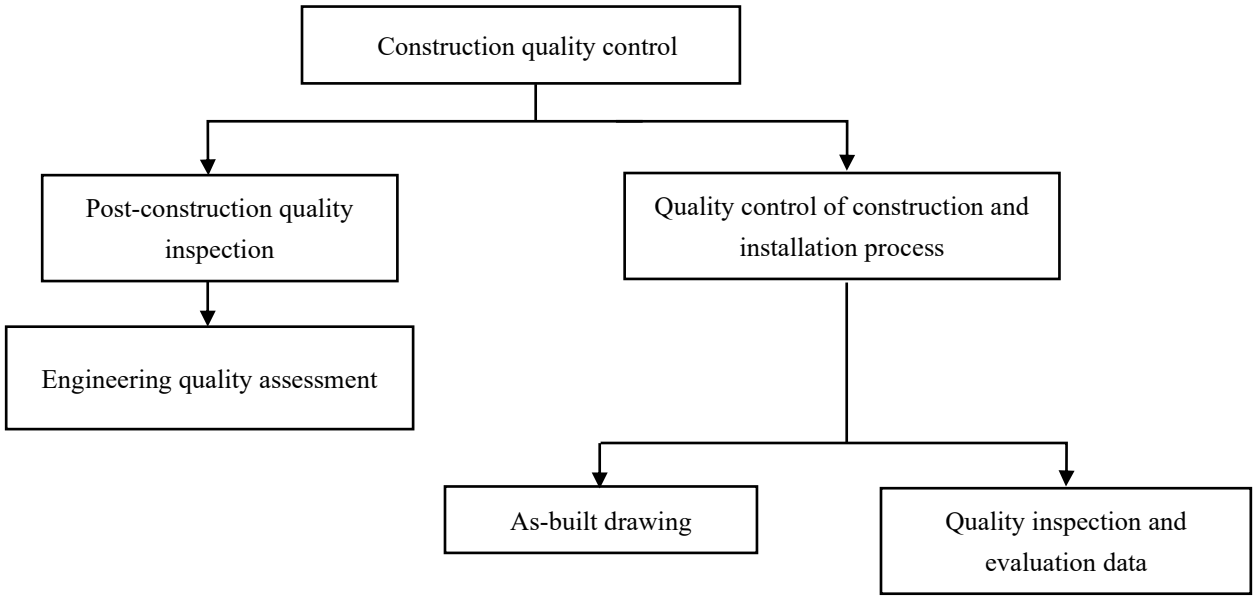

Figure 3. Process of quality control after completion

3.2. Strengthening the management of construction materials

The quality of the materials should be properly managed and controlled to ensure the quality of the final product and safety in building construction. The qualifications of material suppliers should be carefully reviewed in the selection of suppliers to ensure the quality of the construction materials. It is necessary to re-inspect and re-test the materials before using them. The inspection content includes but not limited to the quantity, specification, performance, and quality of the construction materials. The materials can only be used after passing the inspection [1] . When the construction materials are transported to the site, it is important to store them in strict accordance with the corresponding regulations. Besides, protective measures should be taken to prevent the materials from being damp, damaged, and deteriorated during storage. Therefore, only through proper management and quality control of construction materials can the advantages of materials be maximized.

3.3. Strengthening the management of construction machinery and equipment

Construction technology is advancing with the continuous development of the construction industry, and the degree of mechanization of engineering construction is increasing. Many procedures that were previously done manually are currently done with machines are equipment. Although construction efficiency and quality have been significantly improved, there are still some hidden dangers. To maximize the advantages of construction machinery and equipment, we must pay attention to the management of machinery and equipment. The equipment should be regularly inspected and old equipment that have deteriorated should be replaced. Besides, the equipment should be repaired and maintained regularly, so as to ensure normal and stable operation during building construction and prevent safety accidents caused by malfunctioning machinery.

3.4. Improving the comprehensive qualities of construction workers

The technical skills, comprehensive qualities, and safety awareness of construction personnel are directly related to the quality and safety of the construction process. Therefore, construction companies should strengthen the training of construction personnel. All construction personnel should undergo a pre-job training and proper technical briefing before construction to ensure that all construction personnel are

qualified for their roles, especially welders, electricians, and tower cranes [2]. In addition, construction companies also need to realize that it is difficult to ensure that all construction personnel have a strong safety awareness through a few training sessions before construction. Therefore, construction companies should also increase the intensity of publicity on construction safety, set reasonable specifications on construction safety, and increase the enforcement efforts. For example, construction companies can put up posters and specifications related to construction safety at the construction site, so as to subtly strengthen the safety awareness of construction workers. In addition, construction companies can also encourage construction workers to prioritize construction safety by regularly providing lectures on construction safety.

3.5. Standardize construction procedures

In order to ensure the quality and the safety of construction, it is necessary to formulate standardized construction procedures. The construction company is the main body responsible for the construction of the project, so the company should carry out on-site supervision and inspection. It is necessary to pay attention to the quality control and safety management at every stage of a project from construction drawings, technical briefing, to the construction and completion of the project. Every little detail cannot be ignored. In order to ensure the orderly progress of engineering construction, it is necessary to formulate standardized construction procedures [3]. First of all, before the official construction, it is necessary to review of the construction drawings, so as to discover the problems in the design drawings and rectify them in time. After the review stage, it is necessary to brief the construction workers involved on the construction drawings so that they are familiar with the design intent, operation process, and important and difficult points in the construction of the project. Subsequently, the construction of the building should be carried out in strict accordance with the plan. For sections that need to be intersected, it is important to ensure that the construction of intersecting parts does not affect the sections involved. After each section is completed, the construction quality needs to be strictly inspected to ensure that it is up to standard before proceeding to the next step. Once any quality issues are found, the part needs to be reconstructed, and the next step can only be carried out after the reconstructed part meets the required standards.

3.6. Comprehensive implementation of construction safety management

In order to ensure that the construction of each section of the project fulfills the safety requirements, the previous concept of construction safety management should be renewed [4]. A team should be created specially for construction safety management, in which the team will be responsible for evaluating and analyzing potential safety hazards in project construction. The team should also be responsible for predicting the safety risks and the possible losses caused by safety risks of the project. A construction safety risk library should be created, which includes relevant uncertainties in the construction process that may cause safety issues, and practical emergency plans should be formulated based on these risks. In addition, construction companies should also appropriately increase investment in construction safety management according to the characteristics of the project and provide sufficient protective equipment and facilities for project construction. An ideal construction safety management system should also be created, and the responsibilities of each safety management personnel should be clearly defined, so as to ensure the effective development of safety management.

3.7. Maximizing the role of supervisory units

To ensure the construction quality and safety of a building, construction companies usually hire a supervisory unit to track, supervise, manage, and control the entire construction process of the project. However, in some cases, the supervision units did not perform their roles. Nowadays, despite the rapid development of the market economy, various industries are becoming increasingly competitive, and the

same is true for the supervision industry [5]. Therefore, when selecting supervisory unit through bidding, the focus should not only be on the price quotation, but also the qualifications of the supervisory unit and the comprehensive qualities of the staff. Besides, in the process of signing the contract with the supervision unit, the construction company must clearly state the rights and interests of both parties in the contract, and put forward clear requirements for the supervisors, requiring the supervision unit to be equipped with a full range of staff, which will be responsible for the supervision of the entire construction process. Clear requirements regarding the professional qualifications required for the supervision unit staff should also be stated, so that the supervision can be carried out with due diligence. The construction company should also grant the supervision unit some authority in terms of site management, so that when there are quality or safety issues, the team can then solve the problems in time, which will in turn prevent serious damage to the construction quality and safety.

4. Conclusion

In conclusion, to maximize the economic benefits of a building project, it is necessary to emphasize strengthening construction quality control and safety management, so that construction companies can have a competitive advantage. Therefore, construction companies must be aware of the impact of factors like construction materials, construction personnel, and construction machinery and equipment on construction quality and safety, and thus improve on these factors. Besides, construction companies should also formulate standardized construction procedures according to the characteristics of the project, and at the same time implement proper safety management, and form a special supervision team, so as to provide the necessary support for the development of the project. Sufficient financial support can effectively improve the quality and safety of project construction, thereby creating greater value for the companies.

Disclosure statement

The author declares no conflict of interest.

References

[1] Cao X, Liu B, Jiang S, 2023, Research on BIM-Based Construction Engineering Quality Insurance Information Management. Construction Economics, 44(01): 84–90.

[2] Wang Y, Fan X, Ma B, et al., 2023, Research on Construction Engineering Quality Management Framework Based on QR Code and Portal Technology. Construction Economics, 44(01): 99–104.

[3] Yang J, 2022, The Influence and Importance of Engineering Inspection on the Quality Control of Construction Projects. Theoretical Research on Urban Construction (Electronic Edition), 2022(36): 58–60.

[4] Wu G, 2022, Research on Quality Risk Control of Construction Projects under the Theory of Total Quality Management. Engineering and Construction, 36(06): 1838–1840 + 1873.

[5] Zhang J, 2022, Analysis of Effective Strategies for Improving Construction Engineering Management and Construction Quality Control. Theoretical Research on Urban Construction (Electronic Edition), 2022(34): 22–24.