

Effective Strategies for Quality Supervision and Management of Housing Construction Projects

Jie Liu

Susong County Construction Engineering Quality Supervision Station, Anqing, Anhui, 246500, China

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Abstract: Currently, with the continuous acceleration of urbanization in China, the scale of housing construction projects continues to expand. The quality of construction engineering is directly related to the safety of residents, the survival and development of construction enterprises, and social stability. At present, issues such as imperfect supervision mechanisms and inadequate implementation of quality responsibilities exist in the quality supervision and management of housing construction projects. To address these problems, this article proposes core strategies to enhance quality supervision and management from two aspects: establishing a systematic supervision system and strengthening whole-process quality control. This research aims to help improve the quality of housing construction projects, safeguard public interests, promote high-quality and sustainable development of the construction industry, and provide practical references for government regulatory departments and construction enterprises.

1. Introduction

In recent years, the number of housing construction projects in China has continued to increase. From public-oriented affordable housing to commercial complexes, from ordinary residences to super high-rise buildings, project types have become increasingly diverse, and quality requirements have gradually increased. Housing construction project quality is not only the basic guarantee of safety and property rights of homeowners, but also a key link in the survival and development of construction enterprises. At the same time, it is a vital tool for government regulators to accomplish public management and preserve social stability.

2. Importance of Strengthening Quality Supervision and Management in Housing Construction Projects

For homeowners, strengthening the quality supervision and management of housing construction projects directly protects their living safety and property rights. The house purchase is completed, the construction quality does not reach the standard after entering the house, at this time it will cause problems such as wall cracking, water leakage and structural instability. These problems do not only make daily life more complicated but also endanger the wellbeing of individuals. With proper supervision / management these quality issues can be identified and taken care of in time so that home owners may live peacefully ^[1].

The construction enterprises should view from the perspective of their survival and development, strengthening supervision when carrying out the management of housing construction projects. A construction enterprise must always build quality into its work, for if it does not, this will ultimately cost far more because of rework and repairs. More fundamental than this is loss of customer trust and damage to reputation. Strict supervision and management, construction enterprises can standardize the construction process, can improve the construction level, complete high-quality engineering projects for a long time to accumulate good word of mouth, enhance competitiveness in the market development.

For government regulatory departments, enhancing the supervision and management of housing construction projects is an important way to fulfill their public management responsibilities and

protect public interests ^[2]. Through supervision and management, the government regulatory departments can avoid the occurrence of substandard projects in housing construction by making them comply with national quality standards and safety regulations. Not only does this stop the normal order of the real estate market, but it also decreases complaints and disputes caused by quality issues, prevents the waste of public assets due to quality accidents, and makes sure that societal public interests are not harmed.

For the society, strengthening the supervision and management of housing construction projects, is a strong support for maintaining social stability and healthy urban development. The construction of housing is a key part of urban infrastructure and one of the important terms within social security. Many houses are ready to meet the housing needs of residents and this brings a better quality life to residents. Frequent quality problems can not only cause public resentment, but even mass incidents will affect the social harmony ^[3]. Standardized quality supervision and management can be used to ensure the overall quality of urban construction, provide a basis for urban development, supply resources for social orderly operation.

Strengthening supervision and management of housing construction projects, which aims to promote the construction industry transformation and upgrading, is an historical necessity. Right now, the construction field is incredibly competitive and some companies sacrifice quality in order to gain short-term rewards which ultimately leads to a mixed bag of overall quality within the industry. Through strengthening supervision and management, eliminating backward and non-compliant enterprises will make all enterprises in the industry pay more attention to technological innovation and quality management, improve the overall professional level of the industry and improve service quality、standard, promote high-quality standardization development Of construction Industry.

3. Core Strategies for Improving Quality Supervision and Management

3.1 Building a Systematic Supervision System

First, current standards on engineering quality map poorly to the general concept of acceptance; they have vague descriptions and ambiguous boundaries. With an example of the qualified range for wall hollowing and floor thickness without detailed definition, it makes accurate judgment difficult during actual supervision. For example, national legislative departments should revise and refine laws and regulations such as the "Regulations on the Quality Management of Construction Projects" according to the actual situation in the industry. Housing and construction departments need to further refine engineering quality acceptance standards and clarify quality requirements for each stage from foundation construction to finishing ^[4]. At the same time, penalties for illegal and non-compliant behaviors should be clearly defined. For example, if construction enterprises cut corners and cause quality hazards, the amount of fines, the duration of business suspension, and joint accountability measures for enterprise responsible persons should be specified, making laws and regulations a hard constraint for quality supervision.

Second, housing and construction departments, market supervision departments, fire departments, etc., need to jointly carry out the multi-departmental collaborative supervision mechanism. In the past, different departments did supervision work separately, lacked information sharing and had overlapping tasks. For example, when housing and construction departments check the construction process, they do not simultaneously notify market supervision departments of material sampling results, allowing unqualified materials to continue to be used on site. Regulatory blind spots may occur when fire departments take over the acceptance of fire protection facilities but do not connect with housing and construction departments on structural safety inspections. Departments should set up a comprehensive information sharing platform, organize regular collaborative supervision meetings and specify the division of labor. Overall quality Supervision Department of housing and construction departments are responsible for the quality supervision of engineering drafts, and market supervision departments are responsible for building material quality sampling. Firefighting units mainly focus on fire protection facility compliance inspections. In particular, coordination

through data exchange and mutual recognition to avoid repeated inspection or omission of results will be a key aspect in ensuring that supervision covers the complete life cycle project process.

Lastly, part of the supervisory job included "advance notice" and "fixed-point inspections," which made it simple for enterprises to game the system and eliminate quality issues ahead of time. Establish the project database and supervision personnel database of government regulatory departments. Each time supervision is carried out, the inspection targets should be randomly selected through the system. Whether it is a large real estate project or a small-to-medium-sized livelihood project, they should have an equal probability of being inspected ^[5]. At the same time, supervision personnel should be randomly assigned to avoid fixed personnel long-term supervising the same project and forming interest relationships. After supervision is completed, regulatory departments need to publish inspection results on official websites, government service platforms, and other channels, including lists of qualified projects, details of problems with unqualified projects, and rectification requirements. This enables enterprises to accept social supervision, allows the public to understand the quality status of projects, and forces enterprises to pay attention to daily quality control.

3.2 Strengthening Whole-Process Quality Control

In order to ensure good control measures before the construction phase, it is necessary for all relevant parties to conduct collaboration in advance. The construction unit shall entrust a professional institution to carry out preliminary review of the construction drawings during the drawing review stage, and then submit it to the housing and urban-rural development department for further reviewing. As for both parties involved, ensure that the drawings conform to national building standards and pose no structural safety loopholes while fulfilling functional requirements. It is a way which ensures that quality risks are root out at the design level.

Secondly, since this project is at the material and equipment inspection stage, the construction unit shall require suppliers to issue traceable certificates of materials; and the construction company shall cooperate with the supervision unit to perform sampling inspections on materials entering sites. If any materials that do not meet standards are found, they must be immediately eliminated from the site and banned for use in the construction project. In the construction plan preview stage, the construction unit needs to formulate detailed plans according to the actual project, and the supervision unit will review whether the plan is feasible and safe. When it comes to larger projects, have to organize to present industry expertise. And thus the construction plan to follow a scientific and reasonable.

Third, the supervision unit and housing and urban-rural development department in the mid-term supervision procedure need to pay close attention to control factors of importance, for construction company has taken an active role here. Major processes such as concrete pouring and steel structure welding must be supervised by special personnel on site, the whole construction process is tracked, construction data is recorded in real time, and violations of the requirements are required to be rectified immediately. If it is a concealed work, such as foundation treatment, pipeline embedding and the like, after construction completion, the construction company needs to carry out self-inspection. After passing self-inspection, they should apply to the supervision unit and the housing and urban-rural development department for acceptance ^[6]. During the acceptance and quality inspection stage, the housing and urban-rural development department can conduct random inspections of project quality together with third-party testing agencies. At the same time, the construction company needs to use information technology means to record the construction process to ensure traceability of quality issues. This is absolutely not allowed to prevent construction companies from cutting corners during supervision gaps.

Fourth, during the project completion acceptance and warranty stage, the construction unit needs to simultaneously invite the construction company, supervision unit, housing and urban-rural development department, and homeowner representatives to participate to ensure the delivery quality of the project and the rights and interests of homeowners. During the completion acceptance stage, the construction unit needs to organize the construction, supervision, and design units to

conduct joint acceptance according to national acceptance standards. The housing and urban-rural development department needs to be present to supervise the standardization of the acceptance process and review the acceptance results. If non-compliances are found during the acceptance process, the construction company must make rectifications within the specified time; otherwise, the project cannot be delivered to homeowners. During the quality guarantee stage, the construction unit needs to establish a complete quality guarantee file, which should clearly define the warranty scope, warranty period, and responsible parties.

3.3 Enhancing the Professional Competence of Personnel

First, construction enterprises, housing and urban-rural development departments, and industry associations should collaborate to conduct stratified training for different positions. Construction firms need to regularly organize skills training sessions for front-line personnel, and the content of these training should be tailored to actual operations. In the case of bricklayers, they have to learn about control for wall flatness; steel workers need to be trained on binding spacing requirements and concrete workers must master the vibration time and intensity conformed during pouring. For prefabricated construction projects, construction enterprises should arrange for targeted practical teaching on component installation, so that construction personnel can carry out construction according to the quality standards ^[7]. Off-site professional training should be jointly carried out by housing and urban-rural development departments along with industry associations for supervision personnel, which should focus on professional skills related to specific quality inspection standards such as details of hidden-item construction detection (e.g., pipeline embedded in concealed works) or propagation test methods for waterproof materials. Management team members need to documented procedures for recording and tracking the rectification of issues in a standard. Once the training is complete they have to pass assessments in order to work on supervision projects.

Second, housing and urban-rural development departments and regulatory agencies should jointly establish strict qualification certification and exit mechanisms to control the quality level of personnel throughout the entire process from entry to departure. For key positions, such as quality management personnel of construction units and project responsible persons of supervision units, housing and urban-rural development departments should implement on-the-job certification system. Applicants take an exam on professional knowledge that covers engineering mechanics, quality standards, and safety regulations, including practical ability assessments such activities as on-site assessment of whether concrete strength is to standard. In addition, qualification certificates must be reviewed every year. When reviewing, the work records of people during their employment will be inspected such as whether there is a quality supervision error or violation of construction regulations. If a person fails the review, their qualifications will be put on hold until they are re-trained and assessed. Regulatory agencies should directly revoke the qualification certificates of personnel with serious violations, and prohibit them from reapplying within three years to completely negate the impact of unqualified personnel on project quality.

Third, construction enterprises and regulatory agencies should simultaneously strengthen the construction of employees' professional ethics and integrate the concept of "quality first." Construction enterprises should carry out quality awareness education activities monthly, not just empty theoretical lectures, but by showing real videos of quality accidents to let employees intuitively see the harm of quality problems. In addition, quality model sharing sessions should be regularly organized, inviting experienced workers or managers to share how to adhere to quality bottom lines in daily work, helping everyone abandon the wrong concept of prioritizing progress over quality ^[8]. Regulatory agencies should issue detailed regulations on professional ethics supervision, clearly prohibiting supervision personnel and project responsible persons from accepting banquets or gifts from construction units, and prohibiting lowering quality standards for familiar projects. Once violations of professional ethics are discovered, public criticism and condemnation should be given, and the annual assessment scores of relevant personnel should be deducted. For serious cases, they should be directly transferred from their original positions.

4. Conclusion

To sum up, the quality supervision and management system of housing construction projects is a systematic work involving multiple entities, such as government regulatory departments, construction enterprises, supervision units and staff. Good quality supervision management of housing construction engineering, not only directly safeguard the legitimate rights and interests of homeowners living safety, so that homeowners safe home environment, at ease live; And for construction enterprises to establish good market reputation at the same time also improve the enterprise competition ability and promote long-term development. It can also keep the real estate market order, eliminate quality accidents in social conflict, and prepare the urban construction as well as the society stability foundation.

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