Safety Risks and Prevention Strategies in Quality Management of Building Decoration Projects

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Abstract: The construction process of building decoration projects is complex and involves multiple stakeholders. Safety risks persist throughout the entire project lifecycle, from initiation to delivery, directly impacting the stability of engineering quality, the safety of construction personnel, and the overall project benefits. Currently, some companies in the industry exhibit management biases such as "prioritizing progress over safety" and "emphasizing appearance over substance," leading to frequent accidents such as falls from height, material-induced fires, and operational errors. These incidents not only cause economic losses but also damage corporate reputation. This paper analyzes the multifaceted value of safety risk management, identifies three core safety risks based on the characteristics of building decoration engineering, and proposes executable prevention strategies for each risk category. The aim is to provide references for building decoration enterprises to establish a scientific safety management system and enhance risk control capabilities.

1. Introduction

With the advancement of urbanization and increasing demands for improved living standards, building decoration engineering has evolved from merely meeting basic residential functions to a new stage emphasizing "personalized design, quality construction, and green application." Decoration of commercial complexes, custom residential renovations, and public building refurbishments require higher precision in construction techniques, material standards, and personnel skills. However, decoration work is often carried out after the main structure is completed, constrained by space, with dispersed workfaces and extensive use of temporary facilities. Safety risks in decoration projects are more concealed and prone to overlapping compared to those in main structural work[1]. Although the industry has recently placed greater emphasis on safety management, issues such as imperfect systems, inadequate implementation, and weak safety awareness among personnel persist. Therefore, it is necessary to explore safety risks and prevention strategies in the quality management of building decoration engineering.

2. The Value of Strengthening Safety Risk Management in Building Decoration Engineering Quality Management

2.1 Ensuring Personnel Safety and Demonstrating Social Responsibility

Construction personnel are directly exposed to risks. Comprehensive safety management can reduce the incidence of accidents such as falls and electric shocks, preventing casualties. Each accident not only causes pain to the victim’s family and disrupts their economic stability but may also attract public attention, damaging the industry’s image. The building decoration industry is labor-intensive, employing a large number of workers. Ensuring the safety of this group reflects the industry’s fulfillment of social responsibility[2]. Implementing specific safety management measures—such as providing protective equipment for workers at height, standardizing temporary electricity operations, and regularly identifying potential hazards—enables construction personnel to work in a safe environment, fostering a sense of care and respect. This respect for life enhances personnel belongingness, conveys industry responsibility, maintains social stability, and creates a favorable environment for industry development.

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2.2 Ensuring Engineering Quality Compliance and Enhancing Project Benefits

Safety and quality are closely related; most safety hazards are inherently quality hazards. For instance, insecure installation of ceiling joists poses a fall risk and can lead to ceiling cracking and sagging. Non-standard electrical wiring not only increases the risk of electric shock but also shortens the project's service life. Through safety management, enterprises can eliminate hazards throughout the project lifecycle: strictly reviewing materials at the source to prevent substandard products from entering the site; standardizing operational procedures during construction to ensure compliance; strengthening safety inspections during the acceptance phase to guarantee smooth project delivery. This process reduces work stoppages and rework due to accidents, lowering additional costs and avoiding future maintenance disputes and associated expenses. Furthermore, projects that meet quality standards and are safe and reliable satisfy owner requirements, enhance owner satisfaction, ensure on-time delivery, and strengthen the enterprise's economic benefits and market competitiveness[3].

2.3 Promoting Standardized Industry Development and Building Corporate Brand Image

Industry competition has shifted from price wars to quality and safety battles. When clients choose a company, they consider decoration effects and quotes but place greater emphasis on safety management levels and project safety records. Companies that prioritize safety management, standardized processes, comprehensive protective measures, and zero-accident project performance, can project a professional and reliable image, enhance client trust, gain a competitive advantage, and secure more project opportunities. At the industry level, the practices of leading enterprises can create a demonstration effect, motivating others to value risk control and change the extensive development model of "prioritizing cost over safety." Through inter-enterprise communication, cooperation, and guidance from industry associations, safety standards can be unified and improved, and advanced management technologies promoted, collectively elevating the industry's safety level and driving the industry towards refined, high-quality development.

3. Core Safety Risks in Quality Management of Building Decoration Engineering

3.1 High-Altitude Operations and Structural Modification Risks

Tasks such as ceiling installation, exterior wall work, and high-altitude light fixture placement require work at height, demanding extremely high protection and operational standards. However, some companies, to save costs or expedite schedules, often simplify protections: scaffolding lacks standardized base plates or cross bracings, and excessive pole spacing compromises stability; temporary platforms are used without load-bearing verification; workers either do not wear safety harnesses or anchor them incorrectly, violating the "high anchor point, low use" principle. Such failures in protection easily lead to falls, with severe consequences in high-rise projects. Simultaneously, some workers, to achieve design effects, modify load-bearing structures without professional calculation and approval, compromising the building's overall safety, reducing structural stiffness and seismic resistance, and creating hidden risks within the decoration layer[4].

3.2 Material Quality and Usage Risks

Decoration materials form the project's foundation. Substandard quality or improper use can easily lead to accidents. During procurement, some companies choose unqualified suppliers, acquiring inferior materials: artificial boards with excessive formaldehyde or insufficient fire ratings affect air quality and increase fire risk; ceiling joists with insufficient wall thickness and weak compression resistance bend or break under load; wires and cables with thin insulation or fine cores easily short-circuit or overload, igniting materials. During use, workers unfamiliar with material properties often violate rules: using dry-environment boards in bathrooms/kitchens without moisture proofing, causing deformation and layer detachment; mixing adhesives, resulting in weak bonds and no fire resistance, accelerating fire spread; using wood without fire-retardant and anti-corrosion coatings, making it prone to insect damage and acting as combustibles, exacerbating

accident severity.

3.3 Personnel Safety Awareness and Competency Risks

Personnel are the core of construction. Weak safety awareness and insufficient competency are significant risk sources. Many workers have a complacent mindset, treating safety rules as formalities: entering sites without hard hats; stepping over guardrails at height without securing themselves; throwing tools/materials from height, ignoring safety below. Some managers "prioritize progress over safety," treating safety management as an add-on task, compressing time for safety checks and protection; discovering violations only leads to verbal warnings, not thorough rectification; systems become mere formalities, not tailored to the project, causing management-risk disconnection. Furthermore, high industry turnover and extensive use of temporary labor mean some companies provide safety training only covering tasks, not risks and emergencies, leaving temporary workers with weak protective skills as a high-risk group for accidents[5].

4. Response and Prevention Strategies for Safety Risks in Quality Management of Building Decoration Engineering

4.1 Building a "Specialized Plan + Process Control + Technical Support" System

Building decoration enterprises need to focus on managing these risks, forming a closed-loop system. Before project commencement, the technical department must collaborate with construction and safety teams to develop specialized plans, detailing requirements based on construction scenarios: ceiling installation plans should specify scaffold pole spacing, ledger spacing, base plate locations, and plank fixing methods to ensure load-bearing capacity; exterior wall decoration plans should determine gondola selection, installation acceptance procedures, safety harness anchor points, and inspection frequency, strictly prohibiting anchoring to railings or non-load-bearing elements. If structural modifications are involved, plans require calculation by a structural engineer, approval from the client and supervisor, and potentially expert review; work is strictly forbidden before approval is complete[6].

During construction, the project management team must establish a three-tier control mechanism: Safety officers conduct daily inspections of high-altitude work areas, checking for loose scaffold poles, proper harness use, and stable temporary platforms, halting work immediately for rectification if issues are found; Project managers lead weekly comprehensive checks, verifying scaffold settlement and structural modification quality against the specialized plan; At key stages, organize multi-party (client, supervisor, contractor) acceptance; subsequent processes can only begin after passing acceptance and signing. Additionally, enterprises should regularly train high-altitude workers on standard procedures, typical accident cases, and emergency drills to enhance risk awareness and response capabilities.

Furthermore, enterprises can adopt technical means to improve control efficiency: Install smart cameras in high-altitude areas using AI to identify violations like missing hard hats or crossing guardrails, triggering immediate alarms; Use BIM technology to model modified structural areas, simulating stress to identify potential risks beforehand.

4.2 Establishing a "Procurement + Acceptance + Use + Supervision" Full-Chain Mechanism

Enterprises need to manage material quality and usage risks in three phases. During procurement, establish a qualified supplier list, selecting vendors through qualification review, performance assessment, and sample testing, prioritizing well-qualified, reputable companies; Contracts should specify material quality standards, safety requirements, and compensation terms for non-conforming materials, mitigating risks at the source. Implement a procurement information platform recording manufacturer, batch, and certificate numbers for full traceability.

During acceptance, technical, safety, and materials departments must jointly inspect: Verify material certificates and test reports ensuring compliance with contract specifications; Sample and send key materials to third-party labs for testing properties like fire resistance and insulation

resistance; Reject and record non-conforming materials. Store approved materials appropriately: Flammables in separate fireproof warehouses away from ignition sources, equipped with firefighting equipment; Moisture-sensitive materials in dry, ventilated areas to prevent deterioration.

During use, the project management team must provide guidance and supervision: Before work, technicians brief workers on material applications, methods, and precautions; During work, safety and technical personnel regularly inspect, checking for violations, stopping and requiring rework. Maintain material usage logs recording quantities, application locations, and leftovers ensuring traceability, preventing misuse and waste[7]. Additionally, organize regular material training sessions with supplier technicians explaining material properties and new standards to enhance knowledge and reduce misuse risks.

4.3 Implementing a "Layered Training + Supervision & Enforcement + Culture Building" Strategy

Enterprises need to enhance personnel competency from three aspects. Training should be layered and categorized: Worker training focuses on operational norms and skills, followed by theory/practical assessment for qualification; Manager training emphasizes management systems, risk identification, and emergency response to improve control capabilities; Temporary labor training simplifies theory, covers site risks, safe distances, no-throwing rules, confirmed understanding via Q&A.

For supervision and enforcement, establish a three-dimensional mechanism: Develop systems like "High-Altitude Work Safety Management Rules" and "Temporary Electricity Methods," clarifying roles; Link safety performance to pay and promotion, rewarding compliance, penalizing violations; Build an "Enterprise - Project - Team" supervision network: enterprise monthly audits, project daily inspections, team pre-shift checks and post-shift summaries, enabling full participation.

For culture building, enterprises can set up safety culture walls on sites displaying cases and slogans; Hold monthly safety events with quizzes, drills, and model worker selections; Hold regular safety meetings inviting experience sharing, embedding safety concepts deeply. Also, establish training records for mobile workers, documenting content and results, transferring records upon relocation to ensure continuous training, comprehensively enhancing personnel safety awareness and capability[8].

5. Conclusion

The three core risks in building decoration engineering are interconnected, constraining both quality and safety. Through corresponding prevention strategies—addressing high-altitude/structural risks with "Plan + Control + Tech," material risks with the "Full-Chain Mechanism," and personnel risks with "Training + Supervision + Culture"—risks can be effectively reduced. In the future, as the industry transforms towards intelligence and sustainability, deeper BIM risk simulation, promotion of smart monitoring and green materials can further optimize control. Enterprises must continuously strengthen the "safety first" concept, integrate safety into the entire quality process, build systematic systems, promote high-quality industry development, and achieve the unity of personnel safety, project compliance, and enterprise benefits.

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