# Risk Factors and Control Measures in Construction Decoration and Renovation Project Management

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**Abstract:** This study addresses the persistent issues of quality, schedule delays, and safety hazards in construction decoration and renovation project management. Based on practical project management experience, it analyzes the specific manifestations of four core risk factors: material quality and supply, craftsmanship execution, design changes, and safety and environmental compliance. Corresponding control measures and their operational logic are summarized. By analyzing the mechanisms of risk formation and control pathways, this paper details the implementation of key measures: establishing a full-process material control mechanism, strengthening craftsmanship inspection and disclosure, standardizing change management procedures, and implementing dual controls for safety and environmental compliance. These measures provide a practical reference for enhancing decoration and renovation project management, reducing risk incidence, and achieving coordinated control over project quality, schedule, and safety.

## 1. Introduction

Building risk control is a comprehensive systematic management activity which covers the whole life cycle of project management in decoration and renovation construction. That includes identifying possible risks—such as problems in material quality, craftsmanship deviation, design change and safety/environmental noncompliance—and putting into place strong systems for material control, craftsmanship supervision, change standardization and safety/environmental management. Implement proactive preventive, monitoring and/or responsive measures to avoid the impact of these risks on project quality, schedule and cost in order to preserve compliant and orderly project progress. Decoration and renovation projects are particularly prone to issues caused by materials, craftsmanship and design due to the intrinsic complexity of having several interdependent processes. They can be different variations of quality defects, schedule delay or safety incidents, and all these limitations will limit the total potential benefits of the project. Thus, a detailed study of the risk factors and an assessment of their corresponding control measures based on empirical data can be practically significant for unifying project management flow, providing success benchmarks for developers managing similar projects, and yielding meaningful references for practitioners in industry.

## 2. Risk Factors in Construction Decoration and Renovation Project Management

### 2.1 Material Quality and Supply Delay Risks

The quality of materials introduces serious challenges due to the variety of decoration materials and often irregular grading. In order to achieve cost reduction, a small number of suppliers use inferior practices such as using substandard adhesives in boards (leading to excessive formaldehyde emissions) or reducing eco-friendly additives in coatings (causing VOC levels that surpass national standards). How the materials look is also hard to control; you often see color variations and dimensional deviations within a single batch of tiles, or additional plating thickness not being applied on hardware components so prematurely rusting. These defects not only impair aesthetic

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achievements but might also delay the acceptance of a project such as failure in indoor environment monitoring (e.g. high concentrations of formaldehyde) [1]. Supply chain vulnerabilities are especially pronounced. Decoration materials frequently move through multi-tiered supply chains, where disruptions at any point of supply, from raw material procurement and production to logisticscan stop flows. Thus, suppliers become entitled to change prices on unilateral basis or market frequently shifts (For example; Non-Ferrous Metal and Timber). This would quickly lead to disputes in the absence of pre-agreed adjustment mechanisms. Problems in transporting material often stretch cycles beyond expectations due to weather, traffic limits, or core regional logistics bottlenecks. In addition, the lengthy production cycles associated with specialty materials can result in suppliers missing contractual delivery deadlines, which can cause job site shutdowns and throw off an entire construction schedule.

### 2.2 Craftsmanship Standard Execution Deviation Risks

The complexity and high dependency of decoration and renovation tasks means that craftsmanship deviation seeps through the entire construction process. The first problem: specification-grade wall leveling and meshing are not in place (flatness deviation exceeds 3mm). This directly causes subsequent problems: wall cracking or hollow tiles. In ceiling construction, keel spacing and fixation that do not meet design requirements may result in deformation or even collapse. Breaching of waterproofing caused by poor selection of techniques during mid-stage finishing work, like installing bathroom wall tiles with dry-laying method instead of the required wet-laying method. Likewise, outlines how the lack of a "one primer, two topcoats" protocol or inadequate drying periods for the wall coating can also result in adhesion failures and sagging [2]. And later stage finishes, particularly coarse joinery (where horizontal door frame meets a wall or where tile joints are more than 2mm and no bezelling of trims is prepared for the joinery), diminish visual appeal. In addition, the introduction of contemporary methods is often accompanied by resistant behaviour which relies on outmoded procedures preventing the potential benefits provided by new materials and resulting in quality defects. To push for speed, this results in the omission of critical steps such as tile soaking or coating sanding within some teams which simply intensifies craftsmanship deviation.

### 2.3 Risks Arising from Frequent Design Changes

The most common reason for design changes is that the initial design was shallow in its depth. In some design units, client requirements are not fully comprehended or there is no integration of site-specific conditions making the schemes impractical. Then during the construction phase, when a mismatch is found, clients want changes. Similarly, client aesthetic preferences can evolve during a project generating requests to change materials (wall finishes), or specifications (ceiling design). In addition, it is common to request changes orally rather than through standardised written procedures, which leads to ambiguous specifications and possible future conflicts [3]. The repercussions of changes are intense. From a cost perspective, each change requires recalculating the labor, material and equipment costs. However, the completed work often needs to fix and it costs money to do that which in turn leads to going over budget. Changes lead to replanning, remobilisation of men and materials on site, often needing new drawings from designers to get signed-off again by the supervisors which leads to unplanned significant delays. The second is a major problem of wasted resources: materials processed to be used in custom are scrapped when designs change, whilst labor and machinery spent on their manufacture become sunk costs. Also, these changes break the sequencing of interdependent trade activities (e.g., MEP rough-ins conflicting vs wall finishing) which also requires re-coord; this will reduce construction efficiency.

### 2.4 On-site Safety and Environmental Compliance Risks

There are many safety hazards found in a construction site. Be smart with electricity: Wiring that was unauthorized, lack of protection from weather like not using conduit tubes, distribution boxes without GFCI and continues to use of power tools that have insulating parts damaged increases the risk of electrocution exponentially. To avoid fatal consequences, during high-altitude work (like

ceiling or exterior cladding construction), proposed fall protection often depends on workers using safety harnesses, which are sometimes not used or are improperly erected scaffolding. Fire safety management is often chaotic, with flammables stored where they should not be, the inadequate number of fire extinguishers and workers who are poorly informed (e.g. smoking on site) which lead to increasing fire risks [4]. Environmental compliance issues are just as worrying. Operations such as stone cutting or wall grinding without using dust suppression methods (wet-cutting, dust collection equipment) produce excessive amounts of airborne dust that endanger the health of workers and put companies at risk for regulatory penalties. Uncontrolled exhaust gases from painting processes (not treated, such as through adsorption on the activated carbon) break ambient air quality standards. Construction waste that is not sorted into recyclable, hazardous and general categories, apart from improper storage or dumping violates environmental protection laws, subjecting them to penalties and cleanup costs.

## 3. Risk Control Measures in Construction Decoration and Renovation Project Management

### 3.1 Establish a Full-Process Material Control Mechanism

Use a multi-dimensional supplier vetting system that evaluates qualifications, past performance, and capability to produce. Narrow the field to three or more potential suppliers, conduct facility inspections and visual quality control processes, and choose partners with a complete scorecard system to stave off inadequate or inferior suppliers [5]. Adopt full fledged contracts clearly specifying the material standards and delivery dates complete with price adjustment or penalties for delays thereby ensuring clear answerability. Strict Incoming Inspection: joint inspection of materials by project team and supervision unit after delivery. Testing for standards (e.g., 3 samples per coatings batch for VOC, 5 tiles per batch for dimensions). Storage of material is only on the provision of the test reports where they have passed. Inspect for visual defects 100% of the time Second question is to reject non-conforming materials immediately and demand for quick replacement. Build up a supply chain early-warning system: assign personnel to track production progress and double-check plans against actual sites 15 days ahead of time. If production delays or logistics bottlenecks occur, activate contingency supplier plans to secure timely delivery of components, preventing work stoppages.

### 3.2 Strengthen Craftsmanship Disclosure and Process Inspection

Implement tiered craftsmanship disclosure. Before work is even begun, the technical lead gives a general overview to the construction crew of project-wide standards and methods for ensuring quality. Team leaders then use illustrations and mock-ups to explain essential points about sub-processes to operators. Operators at sign off following a briefing to acknowledge understanding [6]. Feature a "Daily Inspection + Key Process Hold Point" Every day, quality inspectors use checklists to score the inspections by tools (rulers are used for wall flatness and feeler gauges are used in grout width). Use photographs to document deviations; issue notices of rectification, assigning roles and timelines. The need to move away from defects accumulation requires that key processes have a formal sign-off by the technical lead and supervising engineer before moving ahead [7]. Make sure that rectifications are closed inspectors sign off on corrections before closing issues. For repetitive issues, set up a whole new root cause action meetings and modify the Way of Working as well as rebrief people that they take into account their shot size with respect to the workmanship precision.

### 3.3 Standardize Design Change Management Process

Require a formal change application as only way to process. Owners or designers are to fill up a written "Design Change Application Form" indicating the Scope of Works affected and Rationalisation for variation along with marked-up drawings (original + revised). Verbal changes are prohibited. The project lead of the contractor must acknowledge receipt to avoid ambiguity-related disputes [8]. Conduct mandatory change impact assessment. When the technical

department receives a submission, it assesses its implications within 3 working days: Identify affected tasks and develop an estimate their effects on schedule; Calculate relevant costs (material loss, new materials cost, labor estimated hours required preparation work [potential rework]); Create a "Change Impact Assessment Report." If as a rule impacts, orchestrate the owner, designer and supervisor for joint resolution. Establish Approval And Execution Protocols Changes that have been approved lead to the immediate (within 24 hours) modification of drawings and budgets, crews being re-briefed on changes, adjustments to plans made, as well as material coordination. Have a person (or persons) as change guardians for implementation to maintain fidelity and not get confused between the new way and an earlier way. After you make changes, hold post-change reviews to compare actual schedule/cost impacts with estimates, analyze deviations, gather field feedback, and update either change management procedures or standard operating procedures to minimize unnecessary future changes;

### 3.4 Implement Dual Control for Safety and Environmental Compliance

Site safety training for decoration-specific hazards: electrical safety, fall protection, fire prevention. You are also required to take an assessment and be certified after your training. Improve on and off duty site safety oversight  Pre task safety talks every morning by a safety officer; Maintain visible signage for Safety in the surrounding environment; Inspect tools insulation, scaffold stability regularly. Workers must be stopped from working until the hazard is corrected. Equip with firefighting equipment; Leave flammable materials in storage with ventilation; Establish no smoking rules [9]. 3. Sustainable: source green materials (low-VOC coatings, eco-friendly boards) and check the environmental test reports when they arrive Use dust suppression (water, water-based methods such as mists and sprays, dust collectors) during cutting / grinding Limit paint fume emissions through the use of exhaust fans and even better, activated carbon adsorption during application. Segregation of waste (recyclable, hazardous and general) with daily collection to specific locations. Weekly air-quality statutory compliance tests conducted on-site by more than one accredited agency every week, or pay based penalties once you get shut down.

## 4. Conclusion

In this paper, it is demonstrated that the risks of construction decoration and renovation project management are mainly concentrated in four aspects: materials, craftsmanship, design and safety/environment. These include material risks that arise as a result of both quality control and issues within the supply chain. Execution risks and poor oversight lead to craftsmanship risks Insufficient depth in initial design and non-standardized procedures leads to the risk associated with design change. Lack of control measures drives safety and environmental risks. Mitigations must be both functional and effective: a homogenous material control mechanism assures on-time delivery, quality, improved craftsmanship disclosure and inspection address deviations, attached change management standards restrict cost/schedule impact from changes, and dual safety/environmental controls mitigate compliance breaches. I.e., these four interconnected measures complete the risk prevention and control system, which greatly improves the effectiveness and efficiency of project management.

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