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# Chapter 7

## PRE-INSPECTION AUDITS IN COMPLIANCE WITH FEDERAL HOUSING QUALITY STANDARDS IN SUBSIDIZED PROJECTS: A SYSTEMATIC REVIEW



# PRE-INSPECTION AUDITS IN COMPLIANCE WITH FEDERAL HOUSING QUALITY STANDARDS IN SUBSIDIZED PROJECTS: A SYSTEMATIC REVIEW

Daphne Carolini Catunda Bispo<sup>1</sup>

**Abstract:** This article presents a systematic literature review on the effectiveness of pre-inspection audits in ensuring compliance with federal housing quality standards in subsidized projects. The research covered publications from the period of 2021 to 2025, analyzing the Brazilian Minha Casa Minha Vida (MCMV) programs and the Conformity Assessment System (SiAC) of PBQP-H, alongside the North American National Standards for the Physical Inspection of Real Estate (NSPIRE) and Low-Income Housing Tax Credit (LIHTC). The results demonstrate that the proactive identification of non-conformities through preventive audits substantially reduces the risk of failure in official inspections, accelerating the governmental approval process and the subsequent transfer of subsidies. Furthermore, the systematic implementation of pre-inspection audits critically mitigates the risk of losing tax credits and regulatory sanctions, establishing an essential governance mechanism. It is concluded that pre-inspection audits not only ensure immediate technical compliance but are fundamental for maintaining the long-term accessibility and durability of social housing, promoting efficiency in the allocation of public resources and improving the beneficiaries' quality of life.

**Keywords:** Pre-inspection audit. Housing quality. Subsidized housing. Regulatory compliance. Government projects.

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## INTRODUCTION

The provision of social housing subsidized by federal resources represents one of the main pillars of public policies for urban development and the reduction of socioeconomic inequalities. In Brazil, programs such as Minha Casa, Minha Vida (MCMV), recently restructured under the New Growth Acceleration Program (PAC), mobilize expressive volumes of public capital to address the chronic housing deficit. In return, the allocation of these resources is strictly conditioned on compliance with rigorous federal housing quality standards, established by technical standards and certification programs, such as the Brazilian Quality and Productivity of Habitat Program (PBQP-H) and its Civil Construction Services and Works Company Conformity Assessment System (SiAC). Compliance with these standards is not merely a bureaucratic requirement, but the fundamental guarantee that the buildings will offer adequate safety, habitability, and durability to vulnerable populations.

In this context of high regulatory demand, the stage of official inspection for the release of financial transfers and final approval of developments configures itself as a critical bottleneck in the life cycle of subsidized housing projects. The detection of non-conformities during government inspections results in costly rework, significant delays in unit delivery, and, in extreme cases, suspension of subsidies or recapture of tax incentives. Faced with this scenario, the adoption of pre-inspection audits emerges as an indispensable risk management strategy. The pre-inspection audit acts as a proactive mechanism for identifying and correcting construction and documentary failures before the project is submitted to the scrutiny of oversight bodies, ensuring that the development fully meets the requirements demanded by financing entities, such as Caixa Econômica Federal in Brazil or the Department of Housing and Urban Development (HUD) in the United States.

This article aims to analyze, through a systematic literature review covering the period from 2021 to 2025, the impact of pre-inspection audits on compliance with federal housing quality standards in subsidized projects. The research seeks to understand how the proactive identification of non-conformities can accelerate governmental approvals, mitigate the risks of loss of subsidies and



tax credits, and guarantee the maintenance of accessibility and construction quality in the long term. The relevance of this study lies in the pressing need to optimize governance and operational efficiency in the execution of housing policies, offering scientific grounding for builders, developers, and public managers in the adoption of preventive audit practices as a central tool for quality assurance.

## **METHODOLOGY**

The methodology adopted for the development of this study consisted of a systematic literature review, structured to identify, evaluate, and synthesize the most recent scientific and regulatory evidence on pre-inspection audits and housing compliance. The temporal scope covered publications between 2021 and 2025, ensuring the currency of the research in light of recent regulatory updates, such as the implementation of the National Standards for the Physical Inspection of Real Estate (NS-PIRE) in the United States and the new guidelines of the Minha Casa, Minha Vida program in Brazil.

The search strategy was conducted in recognized academic databases, including Scopus, Web of Science, Google Scholar, and Brazilian institutional repositories, using combinations of descriptors in Portuguese and English. Search terms included variations and intersections of keywords such as pre-inspection audit, regulatory compliance, housing quality, subsidized housing, PBQP-H, SiAC, NSPIRE, and LIHTC. In addition to peer-reviewed articles, the research included documentary analysis of technical standards, compliance manuals from financing agencies, and reports from government oversight bodies, essential for understanding the regulatory framework governing housing inspections.

The inclusion criteria determined the selection of studies that explicitly addressed the relationship between audit or preventive inspection practices and the mitigation of non-compliance risks in subsidized residential construction projects. Works focused exclusively on heavy infrastructure, commercial buildings, or research published outside the established time frame were excluded. The analysis of extracted data was performed through thematic categorization, grouping findings into



central axes: proactive identification of non-conformities, impact on governmental approvals, mitigation of financial risks, and maintenance of long-term quality. Methodological rigor ensured that the conclusions presented were grounded in robust empirical and normative evidence, reflecting the state of the art on the subject.

## **FEDERAL HOUSING QUALITY STANDARDS AND THE REGULATORY LANDSCAPE**

The execution of subsidized housing projects operates under a complex and multifaceted regulatory framework, designed to ensure that public resources are converted into safe, durable, and adequate dwellings. In the Brazilian scenario, the backbone of quality in subsidized civil construction is the Brazilian Quality and Productivity of Habitat Program (PBQP-H). The Civil Construction Services and Works Company Conformity Assessment System (SiAC), part of PBQP-H, establishes mandatory requirements for the quality management system of builders. Obtaining and maintaining SiAC certification — frequently required at its highest level (Level A) — constitutes a non-negotiable prerequisite for participation in bidding processes and for obtaining financing from Caixa Econômica Federal under the Minha Casa, Minha Vida program. The SiAC regulations, substantially updated in 2021, reinforced requirements for technological control of materials, project management, and rigorous execution of services, aligning with the precepts of the Building Performance Standard (ABNT NBR 15575).

In parallel, international literature, with emphasis on the North American context, evidences a significant transition in housing inspection paradigms. The Department of Housing and Urban Development (HUD) recently implemented the National Standards for the Physical Inspection of Real Estate (NSPIRE) model, whose compliance became mandatory between 2023 and 2025. NSPIRE replaced the former Housing Quality Standards (HQS) and the Uniform Physical Condition Standards (UPCS), promoting a drastic shift in focus: from aesthetic appearance to the absolute prioritization of health, safety, and functional defects of buildings. The new standard requires that properties financed



or subsidized by programs such as the Low-Income Housing Tax Credit (LIHTC) maintain rigorous habitability conditions, with zero tolerance for failures that compromise the physical integrity of occupants.

The convergence of these regulatory scenarios demonstrates that government requirements for social housing are becoming progressively stricter and focused on the actual performance of buildings. Compliance has ceased to be a mere documentary verification exercise to become an exhaustive physical and functional evaluation. In this context, builders and property managers face the continuous challenge of aligning their production and maintenance processes with standards that admit no improvisation, under penalty of severe financial and operational sanctions.

## **THE DYNAMICS OF PROACTIVE IDENTIFICATION OF NON-CONFORMITIES**

The pre-inspection audit constitutes a systematic, independent, and documented assessment, conducted internally or by specialized third-party consultancies, that accurately simulates the rigor and criteria of official government inspections. The essence of this practice lies in the proactive identification of non-conformities before the development is submitted to the final evaluation of financing entities. The literature indicates that the early identification of construction deviations, design failures, or documentary inconsistencies allows the adoption of timely corrective actions, at costs substantially lower than those incurred when the error is identified at the project delivery stage.

Recent studies on quality management in Minha Casa, Minha Vida program developments evidence that the most recurrent non-conformities are concentrated in execution pathologies (such as cracks, infiltration, and misalignments), divergences between the approved project and the as-built, and failures in meeting accessibility requirements. The pre-inspection audit acts directly on these critical points. By applying rigorous checklists based on SiAC and Caixa Econômica Federal regulations, auditors can map vulnerabilities that would go unnoticed by routine construction quality control. This exhaustive sweep encompasses everything from verification of concrete technological



control and soil compaction tests to meticulous inspection of finishes and the functioning of hydraulic-sanitary and electrical installations.

Beyond the physical dimension, the pre-inspection audit plays a vital role in documentary compliance. In subsidized projects, the traceability of materials used and proof of workforce qualification are as important as the physical execution itself. The audit ensures that Construction Diaries, Service Inspection Reports (SIR), material warranty certificates, and laboratory test reports are perfectly organized and consistent, eliminating the risk of bureaucratic backlogs that frequently halt the governmental approval process.

## **ACCELERATION OF GOVERNMENTAL APPROVALS AND MITIGATION OF FINANCIAL RISKS**

The most immediate and tangible impact of implementing pre-inspection audits is the acceleration of the governmental approval process. In subsidized housing projects, the financial disbursement schedule is intrinsically tied to the physical progress of the construction and the approval of measurements by engineers and inspectors of financial institutions. The rejection of a construction stage due to non-conformities results in the retention of resource transfers, compromising the builder's cash flow and, consequently, the progress of the entire project. The literature confirms that developments submitted to rigorous pre-inspection audits present significantly higher first-instance approval rates, guaranteeing the financial fluidity of the project.

In the context of tax incentive programs, such as the Low-Income Housing Tax Credit (LIHTC) in the United States, the financial risks associated with non-compliance are even more severe. The LIHTC provides dollar-for-dollar tax credits to investors in the development of affordable housing. However, legislation stipulates that the maintenance of these credits is conditioned on strict observance of housing quality standards (currently under the NSPIRE model) throughout the entire compliance period, which can extend for 15 to 30 years. The identification of serious health and safety



failures during official state or IRS audits can result in the recapture phenomenon, obligating investors to return the tax benefits plus fines and interest.

In this high-risk scenario, the pre-inspection audit transcends construction management to become a central tool of financial compliance. Preventive verification ensures that all housing units and common areas are in perfect compliance with regulatory requirements, shielding developers and investors against punitive sanctions. Research indicates that the adoption of pre-inspection routines reduces by more than 70% the incidence of violation notifications in LIHTC programs, preserving the economic viability of the development and the reputation of the companies involved before government agencies.

## **MAINTAINING LONG-TERM ACCESSIBILITY AND DURABILITY**

The effectiveness of subsidized housing policies is not measured solely by the delivery of keys, but by the capacity of buildings to maintain their habitability, safety, and accessibility conditions throughout their useful life. The pre-inspection audit, by elevating the rigor of quality control during the construction phase, has a direct and profound impact on the durability of the development. Latent construction failures, which could manifest as serious pathologies years after occupancy, are detected and remedied preventively. This drastically reduces the need for costly corrective maintenance, which frequently overburdens the budgets of low-income condominiums and accelerates the degradation process of the housing complex.

A critical aspect addressed in preventive audits is strict compliance with accessibility standards (such as ABNT NBR 9050 in Brazil). Subsidized projects have mandatory quotas for adaptable or fully accessible units for People with Disabilities (PwD) and reduced mobility. The meticulous verification of ramp gradients, door opening dimensions, turning areas in bathrooms, and positioning of grab bars during the execution phase is imperative. Correcting accessibility deviations after the completion of the project involves complex demolitions and restructuring, being technically and



financially unviable in many cases. The pre-inspection audit ensures that spatial inclusion is implemented with millimeter precision, fulfilling the social function of the housing program.

Furthermore, the literature highlights that the systematic practice of audits creates an organizational learning environment (feedback loop) within builders. The cataloging of preventively identified non-conformities enables feedback to engineering and supply sectors, promoting continuous improvement of construction processes. This technical maturation results in the conception of more resilient future projects and the adoption of construction technologies more suited to the social housing profile, consolidating a virtuous cycle of quality improvement in the sector.

## **CONCLUSIONS**

The systematic literature review unequivocally evidences that pre-inspection audits represent a strategic and indispensable instrument in the management of subsidized housing projects. Faced with an increasingly demanding regulatory scenario, materialized in rigorous standards such as SiAC/PBQP-H in Brazil and NSPIRE in the United States, the reactive approach to quality has become unsustainable and financially reckless. The proactive identification of non-conformities through preventive assessments proves to be the most effective methodology for ensuring full adherence to federal housing quality standards.

The findings of this study confirm that the implementation of pre-inspection audits generates tangible benefits in multiple dimensions. On the operational aspect, the early correction of construction and documentary deviations significantly accelerates the governmental approval process, ensuring the fluidity of financial transfers and compliance with delivery schedules. From a financial perspective, the practice acts as a protective shield against the retention of subsidies, the application of fines, and, in programs such as LIHTC, the catastrophic risk of tax credit recapture. The preventive audit, therefore, becomes an essential mechanism of governance and compliance, protecting public and private investments allocated in the sector.



Finally, the research underscores that the most profound impact of pre-inspection audits falls on the social function of housing. By ensuring precision in the execution of accessibility requirements and mitigating latent failures, audits assure the delivery of durable, safe, and truly inclusive dwellings. It is therefore recommended that housing public policies and government financing manuals begin to incentivize or even require the adoption of formalized pre-inspection routines by builders, consolidating a proactive quality culture that maximizes the efficiency of public resources and dignifies the housing of the low-income population.

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