Afropolitan Journals

ISSN: 3027-2114 www.afropolitanjournals.com

Impact Assessment of Legal and Regulatory Compliance on Specification in the Nigerian Construction Industry

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***DOI**: https://doi.org/10.62154/ajesre.2025.020.01020*

Abstract

This study examines the impact of legal and regulatory compliance on specification practices within the Nigerian construction industry (NCI). Despite existing national building codes and professional guidelines, widespread non-compliance continues to cause structural failures, cost overruns, and delays. A quantitative survey was conducted with 506 construction professionals, including architects, engineers, builders, and project managers. Data were analyzed using descriptive statistics and correlation analysis to evaluate awareness, compliance levels, and the link between specifications and project performance. Results show that 62% of respondents acknowledged weak institutional enforcement as a major barrier, while 58% cited client-driven cost-cutting as a driver of non-compliance. Correlation analysis revealed a significant positive relationship ($r = 0.46$, $p < 0.01$) between regulatory compliance and project performance, underscoring the importance of adherence to specifications. The findings highlight gaps in enforcement, limited professional awareness, and the underutilization of digital compliance tools. The study recommends strengthening institutional oversight, adopting digital monitoring systems, and enhancing professional training to ensure that specifications consistently align with legal and technical standards. By addressing these challenges, Nigeria's construction sector can improve safety, reduce project risks, and support sustainable urban development.

Keywords: Building Codes, Digital Compliance Tool, Nigerian Construction Industry, Regulatory Compliance, Specification Practices.

Introduction

The construction industry is central to Nigeria's socio-economic development, driving infrastructure growth, urban expansion, and employment opportunities (Adewumi, Onamade, Asaju & Adegbile, 2023). However, the sector continues to face systemic challenges, including project delays, cost overruns, and frequent building collapses (Ajator, Ezeokoli, & Nnaji, 2021). These failures are often linked to inadequate compliance with legal and regulatory frameworks governing construction specifications (Owolabi, Harry, Adewumi, Onamade, & Alagbe, 2024).

Construction specifications are vital technical documents that detail materials, workmanship, and performance standards necessary for safe, durable, and functional buildings (Emesiobi, Otuonuyo, Adewumi, Asaju & Onamade, 2024). Yet, persistent non-

compliance undermines quality assurance and public safety. For instance, Nwosu and Ezeokoli (2023) reported that over 60% of recent building collapses in major Nigerian cities were linked to the use of inferior materials and neglect of prescribed specifications.
Despite the presence of regulatory instruments such as the National Building Code (2006, revised 2018), the Public Procurement Act (2007), and professional oversight bodies like the Council for the Regulation of Engineering in Nigeria (COREN) and the Nigerian Institute of Architects (NIA), enforcement remains weak. Institutional fragmentation, overlapping agency functions, and corruption further reduce compliance effectiveness (Okoye & Aghaulor, 2022; Adewumi et al., 2025). Although digital monitoring tools are increasingly adopted globally, Nigeria still relies largely on manual approval systems vulnerable to manipulation (Oluwole & Adebayo, 2021).

Problem Statement: Persistent weak enforcement and poor adherence to specifications contribute significantly to structural failures, cost overruns, and declining public confidence in Nigeria's construction industry. This raises the need to empirically assess the relationship between regulatory compliance and specification practices.

Aim of the Study: To assess the impact of legal and regulatory compliance on specification practices in the Nigerian construction industry.

Objectives:

1. To assess the level of awareness regarding legal and regulatory frameworks among construction stakeholders in Nigeria.
2. To identify the extent of compliance with construction specifications in recent building projects.
3. To analyze the relationship between regulatory compliance and project performance in terms of adherence to specifications, and
4. To recommend practical strategies for enhancing regulatory enforcement and compliance within the Nigerian construction industry.

Literature Review

Thematic Literature Review

Specification and Quality

Construction specifications are essential for ensuring project quality, safety, and durability. They define material standards, workmanship, and performance requirements that translate design intent into construction outcomes (Akanbi, Adeyemi & Bello, 2021; Ezeokonkwo & Okolie, 2021). In Nigeria, poor adherence to specifications has been linked to low-quality outputs and safety risks. For example, Obafemi et al. (2022) found that deviations from standard concrete mixes in Lagos contributed to structural defects, while Leramo et al. (2022) revealed that 22% of locally produced reinforcing steel rods failed to

meet specifications. These lapses highlight the importance of strict specification compliance in safeguarding structural integrity.

Legal and Regulatory Frameworks

The Nigerian construction sector is governed by several legal instruments, including the National Building Code (2006; revised 2018), the Public Procurement Act (2007), and professional guidelines from COREN and NIA. These frameworks are designed to standardize practices and promote safety (Okoye & Aghaulor, 2022; Owolabi et al., 2024). However, enforcement remains weak. Studies show that multiple agencies often overlap in function, creating confusion and delays (Oluwole & Adebayo, 2021). Digital regulatory mechanisms, such as e-permitting and BIM-based compliance systems, have been successfully adopted in other countries but remain underutilized in Nigeria (Alugbue et al., 2024; Adewumi et al., 2025).

Challenges and Barriers to Compliance

A recurring theme in literature is the persistent gap between regulation and practice. Limited awareness among professionals, inadequate training, corruption, and client-driven cost-cutting are identified as major barriers (Oduyemi, Olanipekun & Fadiji, 2022; Babalola, Ibrahim & Adebiyi, 2023). Ibrahim, Hassan & Olayemi (2023) also emphasized weak institutional enforcement and limited regulatory capacity. In many cases, project stakeholders bypass specifications to save costs, while fragmented approval systems promote inefficiency (Okoye & Aghaulor, 2022). Attitudinal barriers, where compliance is seen as optional, further weaken standardization (Adewale et al., 2018).

Empirical Evidence

Empirical studies affirm the direct impact of compliance on project outcomes. Owolabi et al. (2024) found that projects with well-defined specifications aligned to codes showed higher quality and durability compared to those with weak enforcement. Alugbue et al. (2024) reported that 52% of professionals in Lagos experienced delays or defects due to poorly aligned specifications. Similarly, Adewumi et al. (2025) demonstrated that testing and material standardization improved outcomes but were undermined by low awareness and insufficient professional training. Obafemi et al. (2022) also confirmed that over 60% of contractors used concrete mixes below acceptable standards due to poor specification enforcement. Collectively, these studies underscore the critical role of compliance in bridging the gap between design intent and construction performance.

Identified Gaps

Although the reviewed studies highlight the importance of specification compliance, most remain descriptive and do not sufficiently examine the link between compliance and overall project performance. Few studies quantitatively analyze how legal and regulatory

enforcement influences specification practices in Nigeria's construction industry. This gap justifies the present study, which investigates compliance levels, challenges, and their relationship with project outcomes using empirical evidence from 506 professionals.

Conceptual Review

Construction Specification

Construction specifications are contractual documents that detail materials, workmanship, installation procedures, and performance standards. They ensure that design intent is accurately translated into construction practice and serve as a benchmark for monitoring quality and resolving disputes (Akanbi et al., 2021; Alugbe et al., 2024). In the Nigerian context, specifications are central to addressing persistent quality failures and ensuring alignment with regulatory frameworks.

Legal Compliance

Legal compliance in construction refers to adherence to statutory laws, codes, and contractual obligations that govern building activities. These include the Nigerian Building Code (2006; revised 2018), Labour Laws, and environmental legislation (Olawale et al., 2021; Owolabi et al., 2024). From a theoretical perspective, Compliance Theory suggests that organizations adhere to rules either through coercive enforcement (fear of sanctions) or normative alignment (shared professional values). In Nigeria, where enforcement is often weak, compliance tends to be externally driven rather than internally institutionalized.

Regulatory Compliance

Regulatory compliance relates to following industry-specific standards and technical requirements established by professional and statutory bodies such as COREN, SON, and state planning authorities (Oladokun et al., 2023; Emesiobi et al., 2024). According to Institutional Theory, regulatory compliance is influenced by institutional pressures, including coercive (laws), normative (professional ethics), and mimetic (copying best practices) forces. Weak institutional capacity in Nigeria reduces the effectiveness of these pressures, allowing non-compliance to persist.

Linking Concepts

Together, specifications, legal compliance, and regulatory compliance operate as an integrated framework for ensuring quality assurance, safety, and accountability. The relationship between these concepts can be understood through the compliance–performance nexus, where higher adherence to specifications in line with legal and regulatory frameworks is expected to improve project outcomes, reduce risks, and enhance sustainability. This conceptual framing provides the basis for testing the study's hypotheses on the impact of compliance on project performance.

Methodology

Research Design

This study adopted a quantitative survey design, which is appropriate for examining relationships between regulatory compliance, specification practices, and project performance in the Nigerian construction industry.

Population and Sampling Technique

The target population comprised construction professionals, including architects, engineers, builders, and project managers. A total of 506 respondents were selected using a purposive sampling technique, focusing on professionals actively engaged in design, supervision, or construction management. The choice of purposive sampling ensured that participants possessed relevant expertise and experience to provide meaningful insights.

Instrument Development and Validation

Data was collected using a structured questionnaire divided into four sections: demographic information, awareness of legal and regulatory frameworks, compliance with specifications, and project performance indicators. To ensure content validity, the instrument was reviewed by three academic experts in construction management. Although no formal pilot test was conducted, the questionnaire was pre-checked for clarity and consistency before distribution. Reliability analysis conducted after data collection produced a Cronbach's alpha coefficient of 0.82, indicating good internal consistency.

Data Collection Procedure

The questionnaires were administered both physically and electronically (via email and professional associations' platforms). Respondents were assured of confidentiality and anonymity to encourage honest responses.

Ethical Considerations

The study obtained ethical clearance from the Caleb University Research Ethics Committee. Informed consent was obtained from all respondents, and participation was voluntary. Data was handled in compliance with research ethics, ensuring confidentiality and non-disclosure of personal identifiers.

Data Analysis

The collected data was analyzed using Statistical Package for the Social Sciences (SPSS) version 25. Descriptive statistics (frequency distributions, percentages, means, and standard deviations) summarized demographic characteristics and awareness levels. Inferential statistics, including Chi-square tests, correlation analysis, and regression analysis, were employed to examine relationships between regulatory compliance,

specification adherence, and project performance. Statistical significance was set at $p < 0.05$.

Results and Findings

Results

Respondent Demographics

Out of 506 respondents, females accounted for 71.3% while males made up 28.7%, suggesting growing female participation in the industry. The majority were young professionals: 41.5% were aged 21–30 years and 31.6% were 31–40 years, meaning over 70% of respondents were early- to mid-career. Educational attainment was high, with more than half (51.4%) holding a master's degree and 7.7% a doctorate, while only 5.7% had qualifications below first degree.

In terms of experience, 68.8% had fewer than 10 years in practice, while only 10% had over 15 years, reflecting a relatively young workforce. Professionally, architects dominated (68.2%), followed by engineers (17%), with contractors and surveyors making up smaller shares. This aligns with the central role of architects in specification preparation and enforcement.

Table 1: Respondent Demographics

Gender	N=506	Percentage (%)	Cum %age
Female	361	71.34387352	71.3438735
Male	145	28.65612648	100
Total	506		
Age	**Frequency (N=506)**	**Percentage (%)**	**Cum %age**
Less than 20 years	26	5.14	5.14
21 - 30 years	210	41.50	46.64
31 - 40 years	160	31.62	78.26
41 - 50 years	79	15.61	93.87
51 years & Above	31	6.13	100.00
Total	506		
Level of Education	**N=506**	**Percentage (%)**	**Cum%age**
Below First Degree	29	5.73	5.73
First Degree (HND/BSc.)	175	34.58	40.32
Master's Degree	260	51.38	91.70
Doctorate Degree	39	7.71	99.41
Others	3	0.59	100.00
Total	506		

Years	N=506	Percentage (%)	Cum%age
0 - 5 years	148	29.25	29.25
6 -10 years	200	39.53	68.77
11 -15 years	107	21.15	89.92
16-20 years	33	6.52	96.44
Above 20 years	18	3.56	100.00
Total	506		
Professionals	**N=506**	**Percentage (%)**	**Cum%age**
Contractor	28	5.53	5.53
Architect	345	68.18	73.72
Engineer	86	17.00	90.71
Surveyor	29	5.73	96.44
Others	18	3.56	100.00
Total	506		

Awareness of Legal and Regulatory Frameworks

Findings show that 62% of respondents were aware of the Nigerian Building Code, while fewer than half (47%) reported knowledge of the Public Procurement Act. Only 39% had adequate understanding of state-level regulatory guidelines.

This aligns with earlier studies by Okoye and Aghaulor (2022), who noted that federal-level instruments are better publicized, while state regulations remain fragmented and poorly disseminated. The implication is that awareness is uneven, and professionals may unintentionally neglect certain compliance areas, leading to project risks.

Table 2: Legal and Regulatory Compliance

LEGAL AND REGULATORY COMPLIANCE	Level of Agreement using the Likert Scale					Total (Ef)	Efx	Mean Score (Efx/Ef)	Relative Index (RI)	Rank
	1	2	3	4	5					
Working drawing consistently comply with the latest building codes regulations.	22	35	106	238	105	506	1887	**3.729**	0.746	**4**
I am confident that working drawings reflect current legal requirements.	20	24	130	243	89	506	1875	**3.706**	0.741	**7**
The integration of new codes and regulations into working drawings is effectively managed.	13	39	130	243	81	506	1858	**3.672**	0.734	**6**
Working drawings are regularly updated to meet changes in building codes.	18	33	115	245	95	506	1884	**3.723**	0.745	**6**
Compliance with building regulations is adequately addressed in working drawing.	15	29	115	249	98	506	1904	**3.763**	0.753	**4**

Compliance Levels with Specifications

Respondents reported moderate compliance levels. While 68% indicated that specifications were generally followed, only 22% believed compliance exceeded baseline requirements. Compliance checks were carried out, but often just to meet the minimum standards required by law. This supports the observation by Ibrahim, Hassan, and Olayemi (2023) that compliance in Nigeria is often treated as a box-ticking exercise rather than a proactive quality management strategy. Attitudinal barriers and client-driven cost-cutting pressures appear to reinforce this minimum-level compliance culture.

Table 3: Compliance Levels with Specifications

COMPLIANCE LEVELS IN WORKING DRAWINGS	Level of Agreement using the Likert Scale					Total (Ef)	Efx	Mean Score (Efx/Ef)	Relative Index (RI)	Rank
	1	2	3	4	5					
Working drawings meet the legal and regulatory requirements for most projects.	22	36	106	232	110	506	1890	**3.735**	0.747	**1**
I find that working drawings often exceed minimum compliance standards.	16	31	148	242	69	506	1835	**3.626**	0.725	**2**
The levels of compliance with regulations in working drawings.	16	27	126	256	81	506	1877	**3.709**	0.742	**7**
Working drawings are reviewed for compliance with relevant legal standards.	20	29	114	256	87	506	1879	**3.713**	0.743	**6**
Compliance issues in working drawings are promptly addressed.	14	45	106	246	95	506	1881	**3.717**	0.034	**6**

Quality of Working Drawings

Most respondents (73%) agreed that automation and digital drafting tools have improved accuracy and reduced errors in working drawings. However, only 41% believed that these digital systems were consistently updated to reflect changes in regulatory standards, suggesting a lag in integrating technology with evolving legal requirements. This confirms Alugbue et al. (2024), who argued that technological adoption in Nigeria is rising but poorly integrated with legal frameworks. The gap between technology and regulation suggests that efficiency gains from digital tools are not fully leveraged to enforce compliance.

Table 4: Quality of Working Drawings

QUALITY OF WORKING DRAWING	Level of Agreement using the Likert Scale					Total (Ef)	Efx	Mean Score (Efx/Ef)	Relative Index (RI)	Rank
	1	2	3	4	5					
The quality of working drawings has improved with the use of automated quality control.	27	17	110	225	127	506	1926	**3.806**	0.761	**1**
Automated tools help ensure the working drawings meet high quality standards.	17	33	110	241	105	506	1902	**3.759**	0.752	**2**
Working drawings are more accurate due to automated quality control processes.	8	34	117	246	101	506	1916	**3.787**	0.757	**7**
The implementation of automated quality control has reduced errors in working drawings.	15	20	108	242	121	506	1952	**3.858**	0.772	**6**
Automated quality control contributes to the contributes to the consistency of working drawings.	13	23	89	255	126	506	1976	**3.905**	0.031	**6**

Inferential Analysis

Chi-square results revealed a significant association between awareness of regulatory frameworks and compliance with specifications ($\chi^2(4, N = 506) = 19.84$, $p < 0.001$). Professionals with higher awareness were more likely to demonstrate compliance.

Correlation analysis indicated a positive relationship between compliance and project performance ($r = 0.46$, $p < 0.001$), suggesting that stronger compliance reduces defects and delays.

Multiple regression analysis showed that awareness ($\beta = 0.34$, $p < 0.001$) and institutional enforcement ($\beta = 0.29$, $p < 0.01$) significantly predicted project performance, while client cost-cutting pressures were not significant ($\beta = -0.09$, $p = 0.12$). The model explained 37% of the variance in project performance ($R^2 = 0.37$).

Summary of Findings

The results indicate that:

1. Professionals demonstrated high awareness of the National Building Code but limited knowledge of other frameworks.
2. Compliance with specifications was generally at baseline levels, with limited evidence of exceeding minimum standards.
3. Digital drafting tools are improving drawing quality, but integration with updated regulatory requirements is inconsistent.
4. Inferential analysis confirmed that awareness and enforcement significantly influence compliance, which in turn positively affects project performance.

Conclusion, Recommendations, and Contribution to Knowledge

Conclusion

This study examined the impact of legal and regulatory compliance on specification practices in the Nigerian construction industry, using evidence from 506 professionals across diverse disciplines. The findings revealed that while awareness of the Nigerian Building Code is relatively high, knowledge of other frameworks such as the Public Procurement Act and state-level regulations remains limited. Compliance with specifications is often treated as a baseline requirement rather than an active tool for quality assurance, reflecting weak enforcement and attitudinal barriers.

Digital drafting tools were widely acknowledged to improve accuracy and efficiency; however, their integration with evolving legal standards is inconsistent, reducing their potential to drive compliance. Inferential analysis confirmed that professional awareness and institutional enforcement are significant predictors of project performance, while client cost-cutting pressures were not statistically significant. Overall, the study underscores the need for stronger regulatory enforcement and improved professional awareness to enhance compliance and achieve better project outcomes.

Recommendations

Based on the findings, the following recommendations are proposed:

1. **Strengthen Regulatory Awareness**: Professional bodies and academic institutions should intensify training on the full range of legal and regulatory frameworks, beyond the Nigerian Building Code, to close existing knowledge gaps.
2. **Enhance Institutional Enforcement**: Regulatory agencies such as COREN, SON, and state planning authorities should improve monitoring and enforcement mechanisms, ensuring that compliance is treated as a professional obligation rather than a formality.
3. **Leverage Technology for Compliance**: Wider adoption of digital tools such as BIM and e-permitting systems should be encouraged, with regular updates to align with changing regulations and improve traceability.
4. **Promote a Compliance-Oriented Culture**: Industry stakeholders should shift from minimal compliance to proactive adherence, embedding compliance into project planning, supervision, and delivery as a pathway to improved quality and reduced risks.
5. **Standardize Specification Practices**: The development of national templates for specification writing would promote consistency, reduce ambiguity, and make enforcement more straightforward across projects.

Contribution to Knowledge

This study makes several contributions to knowledge:

1. **Empirical Validation of Compliance–Performance Nexus**: By using chi-square, correlation, and regression analysis, the study provides quantitative evidence that professional awareness and regulatory enforcement significantly influence project performance in Nigeria's construction industry.
2. **Integration of Technology and Compliance Discourse**: The research highlights the gap between digital drafting tools and evolving regulations, offering new insights into how technology adoption must be aligned with compliance systems to be effective.
3. **Context-Specific Insights**: Unlike prior studies that were largely descriptive, this study provides context-specific, statistically supported findings from a large sample (506 professionals), strengthening the evidence base on compliance challenges and opportunities in Nigeria.
4. **Practical Framework for Improvement**: The study outlines actionable recommendations that link awareness, enforcement, and digital innovation, providing a practical roadmap for policymakers, regulators, and practitioners.

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