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Neil Govender; Samuel Laryea; R Watermeyer

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Case Study

Blueprint to Success: Project Managers' Perspectives on Key Factors Influencing Construction Document Quality in South Africa

Neil Govender, Ph.D., C.Eng.[1]; Samuel Laryea, Ph.D.[2]; and Ron Watermeyer, D.Sc., C.Eng.[3]

Abstract: Construction documents are critical to the successful delivery of projects, yet poor quality often leads to errors, delays, and disputes. This study identifies the key factors influencing document quality through a two-stage research design involving an online questionnaire with 32 project managers and in-depth interviews with four project management experts, each with 20 to 50 years of experience. Five key factors were identified: competence, procurement systems, time management, accuracy of design information, and communication. Competence emerged as the most influential factor, emphasizing the importance of appointing qualified professionals with the appropriate skill set. The study also highlights systemic issues with procurement practices, noting that cost-based selection frequently undermines quality—a challenge particularly relevant to the South African context. Additionally, effective time management, clear communication, and maintaining accurate design information were recognized as critical project management elements that directly impact construction documentation quality. This study advances the global body of knowledge in construction engineering and management by offering a nuanced, project manager–centered understanding of the factors affecting document quality, an area that has received limited academic attention. The research captures deep qualitative insights from seasoned professionals, providing value for both academia and industry. **DOI: 10.1061/JCEMD4.COENG-16710.** *© 2025 American Society of Civil Engineers.*

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Introduction

In the construction industry, the quality of construction documents is widely recognized as a critical determinant of project success (Love and Li 2000; Assaf et al. 2018). These documents, which include detailed drawings, specifications, and contractual agreements, serve as the blueprint for transforming design intent into built reality. Poor-quality documentation can lead to misinterpretation, costly delays, budget overruns, and legal disputes, ultimately compromising project outcomes (Love et al. 2012). As construction projects grow increasingly complex, ensuring the accuracy and clarity of construction documents has become more essential (Shoar and Chileshe 2021).

Despite technological advancements, such as building information modeling (BIM), construction projects continue to encounter issues stemming from inadequate documentation. According to Arditi and Gunaydin (1998), incomplete or ambiguous construction documents are among the primary causes of project delays and cost overruns. Many factors affect the quality of construction documents, from design phase coordination to communication between stakeholders. However, project managers—who are responsible for overseeing the life cycle of construction projects—offer particularly valuable insights into these challenges as they are generally involved in construction projects from inception to close out and interact with professionals from all disciplines in the project team.

This study aims to investigate the key factors influencing the quality of construction documents, drawing on the experiences and insights of project managers in the construction industry. The study was conducted in the South Africa and provides insights following a two-stage research design that elicited responses via an online questionnaire and interview. Gaining a deeper understanding of the key factors influencing the quality of construction documents is essential for improving documentation quality and, by extension, overall project performance in the construction industry. Previous research has shown that poor-quality construction documents often lead to inefficiencies such as cost overruns and delays (Love et al. 2011). The purpose of this research is to identify the factors that must be addressed to improve the quality of construction documents, drawing on the insights of experienced project managers. In doing so, the study contributes to the growing body of knowledge focused on enhancing project outcomes through higher-quality construction documents.

Literature Review

The quality of construction documents has long been identified as a critical factor influencing project outcomes in the construction industry. These documents, which encompass detailed drawings, specifications, and contracts, serve as the foundation for executing design intent on-site. High-quality documentation ensures that project goals, expectations, and procedures are clearly understood and followed. Poor-quality documentation, on the other hand, has been linked to increased project risks, including delays, cost overruns, rework, and disputes (Love et al. 2016; Assaf et al. 2018). To address these issues, numerous studies have explored the factors influencing the quality of construction documents.

[1]Postdoctoral Researcher, School of Construction Economics and Management, Univ. of the Witwatersrand, Johannesburg, Gauteng 2017, South Africa (corresponding author). Email: Neil.Govender@wits.ac.za

[2]Member of the Royal Institution of Chartered Surveyors, Head of School, School of Construction Economics and Management, Univ. of the Witwatersrand, Johannesburg, Gauteng 2017, South Africa. Email: Samuel.Laryea@wits.ac.za

[3]Visiting Adjunct Professor, School of Construction Economics and Management, Univ. of the Witwatersrand, Johannesburg, Gauteng 2017, South Africa. Email: watermeyer@ioptions.co.za

Note. This manuscript was submitted on November 26, 2024; approved on May 29, 2025; published online on August 30, 2025. Discussion period open until January 30, 2026; separate discussions must be submitted for individual papers. This paper is part of the ***Journal of Construction Engineering and Management***, © ASCE, ISSN 0733-9364.

Factors Affecting Construction Document Quality

Studies examining the factors influencing the quality of construction documents have been conducted in the construction industry in various countries, including Australia (Tilley and McFallan 2000), Ghana (Fatawu et al. 2020), Japan (Minato 2003), Nigeria (Awolesi and Ayedun 2012; Dosumu and Iyagba 2013; Dosumu et al. 2017), Saudi Arabia (Bubshait et al. 1999; Darwish 2005), South Africa (Akampurira and Windapo 2018), and Syria (Zidan 2013). The factors influencing document quality, as identified in the literature, are summarized in Table 1. Among the most frequently cited factors are low fees, available time, client-driven changes, and experience. Notably, none of the studies contained project managers as the core participant group.

The primary gap in the research literature lies in the lack of studies examining project managers' perceptions of the factors affecting the quality of construction documents. Previous studies treated all built environment professionals as a homogeneous group, failing to conduct discipline-specific analyses to highlight the unique perspectives of each discipline. The omission of project managers perspectives is particularly problematic in the construction industry, where project managers play a pivotal role in overseeing and coordinating multiple aspects of a project, from planning and budgeting to execution and delivery. As central figures on construction projects, project managers have a comprehensive view of the entire project lifecycle, and their insights are crucial to understanding the practical challenges and decisions that affect document quality.

Project managers also play a key role in managing client relationships, handling changes in project scope, and addressing issues that arise during construction. These responsibilities directly impact the documentation process, particularly when changes need to be reflected in drawings, contracts, and reports. Therefore, their views are vital for understanding how factors such as client-driven changes, time constraints, and resource limitations affect the quality and accuracy of construction documentation.

Incorporating the viewpoints from project managers would provide a comprehensive of the challenges and strategies involved in maintaining high standards of documentation throughout the construction process.

Table 1. Factors influencing the quality of project and design documents

References	Research topic	Factor	Participants	Frequency
Tilley and McFallan (2000)	Design and documentation quality in the Australian construction industry	Low fees	Designers and contractors	7
Minato (2003)	Design documents quality in the Japanese construction industry		Designers and contractors	
Darwish (2005)	Design and documentation quality in the Saudi Arabian construction industry		Designers, contractors, and owners	
Slater and Radford (2012)	Deficiencies in architects' design documentation and the effects on project procurement in Australia		Contractors, engineers, architects, and quantity surveyors	
Zidan (2013)	Factors affecting design quality in the construction industry in Syria		Designers, contractors, and construction professionals	
Akampurira and Windapo (2018)	Factors influencing the quality of design documentation on South African civil engineering projects		Civil engineers	
Fatawu et al. (2020)	Factors that cause poor quality of design and contract documentation and the influence on project implementation in Ghana		Contractors and consultants (mostly architects and quantity surveyors)	
Tilley and McFallan (2000)	Design and documentation quality in the Australian construction industry	Time available	Designers and contractors	7
Minato (2003)	Design document quality in the Japanese construction industry		Designers and contractors	
Darwish (2005)	Design and documentation quality in the Saudi Arabian construction industry		Designers, contractors, and owners	
Slater and Radford (2012)	Deficiencies in architects' design documentation and the effects on project procurement in Australia		Contractors, engineers, architects, and quantity surveyors	
Zidan (2013)	Factors affecting design quality in the construction industry in Syria		Designers, Contractors and construction professionals	
Dosumu et al. (2017)	Causes of errors in construction contract documents in Nigeria		Designers and contractors	
Akampurira and Windapo (2018)	Factors influencing the quality of design documentation on South African civil engineering projects		Civil engineers	
Darwish (2005)	Design and documentation quality in the Saudi Arabian construction industry	Changes by client	Designers, contractors, and owners	4
Zidan (2013)	Factors affecting design quality in the construction industry in Syria		Designers, contractors, and construction professionals	
Dosumu et al. (2017)	Causes of errors in construction contract documents in Nigeria		Designers and contractors	
Fatawu et al. (2020)	Factors that cause poor quality of design and contract documentation and the influence on project implementation in Ghana		Contractors and consultants (mostly architects and quantity surveyors)	

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Table 1. (*Continued*.)

References	Research topic	Factor	Participants	Frequency
Bubshait et al. (1999)	Quality practices in design firms in Saudi Arabia	Experience	Designers	4
Dosumu and Iyagba (2013)	Factors responsible for errors in construction documents in Nigeria		Designers and contractors	
Dosumu et al. (2017)	Causes of errors in construction contract documents in Nigeria		Designers and contractors	
Assaf et al. (2018)	Causes of deficiencies in design documents for large construction projects in Saudi Arabia		Designers	
Slater and Radford (2012)	Deficiencies in architects' design documentation and the effects on project procurement in Australia	Inadequate coordination	Contractors, engineers, architects, and quantity surveyors	3
Philips-Ryder et al. (2013)	Document quality in Australian construction projects—perspectives of subcontractors		Contractors	
Assaf et al. (2018)	Causes of deficiencies in design documents for large construction projects in Saudi Arabia		Designers	
Slater and Radford (2012)	Deficiencies in architects' design documentation and the effects on project procurement in Australia	Insufficient review	Contractors, engineers, architects, and quantity surveyors	3
Dosumu and Iyagba (2013)	Factors responsible for errors in construction documents in Nigeria		Designers and contractors	
Fatawu et al. (2020)	Factors that cause poor quality of design and contract documentation and the influence on project implementation in Ghana		Contractors and consultants (mostly architects and quantity surveyors)	
Darwish (2005)	Design and documentation quality in the Saudi Arabian construction industry	Difficulty getting paid	Designers, contractors, and owners	2
Fatawu et al. (2020)	Factors that cause poor quality of design and contract documentation and the influence on project implementation in Ghana		Contractors and consultants (mostly architects and quantity surveyors)	
Tilley and McFallan (2000)	Design and documentation quality in the Australian construction industry	Inadequate project brief	Designers and contractors	2
Fatawu et al. (2020)	Factors that cause poor quality of design and contract documentation and the influence on project implementation in Ghana		Contractors and consultants (mostly architects and quantity surveyors)	
Love et al. (2006)	Contract documentation and the incidence of rework in Australian construction projects	Ineffective use of information technology	Contractors and consultants	2
Slater and Radford (2012)	Deficiencies in architects' design documentation and the effects on project procurement in Australia		Contractors, engineers, architects, and quantity surveyors	
Zidan (2013)	Factors affecting design quality in the construction industry in Syria	Lack of information available	Designers, contractors, and construction professionals	2
Fatawu et al. (2020)	Factors that cause poor quality of design and contract documentation and the influence on project implementation in Ghana		Contractors and consultants (mostly architects and quantity surveyors)	
Darwish (2005)	Design and documentation quality in the Saudi Arabian construction industry	Slow decision-making by clients	Designers, contractors, and owners	1
Assaf et al. (2018)	Causes of deficiencies in design documents for large construction projects in Saudi Arabia	Communication	Designers	1
Wimalasiri et al. (2010)	Investigation into the causes of designer error in the UK oil and gas industry	Competence	Clients, designers, and end users	1
Slater and Radford (2012)	Deficiencies in architects' design documentation and the effects on project procurement in Australia	Failure to adhere to standards	Contractors, engineers, architects, and quantity surveyors	1
Love et al. (2006)	Contract documentation and the incidence of rework in Australian construction projects	Incomplete design at the time of tender	Contractors and consultants	1
Dosumu and Iyagba (2013)	Factors responsible for errors in construction documents in Nigeria	Erratic decision-making	Designers and contractors	1

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Table 1. (*Continued*.)

References	Research topic	Factor	Participants	Frequency
Assaf et al. (2018)	Causes of deficiencies in design documents for large construction projects in Saudi Arabia	Level and quality of design professional's education	Designers	1
Slater and Radford (2012)	Deficiencies in architects' design documentation and the effects on project procurement in Australia	Pressure on firms to become leaner due to competition	Contractors, engineers, architects, and quantity surveyors	1
Bubshait et al. (1999)	Quality practices in design firms in Saudi Arabia	Quality management systems	Designers	1
Love et al. (2006)	Contract documentation and the incidence of rework in Australian construction projects	Staff turnover	Contractors and consultants	1
Bubshait et al. (1999)	Quality practices in design firms in Saudi Arabia	Training	Designers	1

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Research Design and Methods

A two-stage research design was employed to first gain a broad understanding of the key factors impacting construction document quality, followed by a deeper exploration of these factors through interviews. In the first stage, an online questionnaire was used as the primary research method to identify the factors influencing construction document quality. Only factors cited by 20% or more of the participants advanced to the second stage. The second stage involved conducting in-depth interviews with project managers to validate the key factors. Ultimately, only those factors identified in Stage 1 and confirmed during Stage 2 were recorded as key determinants of construction document quality. Further details about the two-stage research design are provided below.

Stage 1: Online Questionnaire

The first stage involved distributing a survey in the form of an online questionnaire to project managers in the construction industry. The questionnaire was designed to collect qualitative, open-ended responses about the key factors influencing the quality of construction documents. It consisted of a single open-ended question, asking project managers to list the key factors affecting construction document quality based on their industry experience. The rationale for using an open-ended question, rather than employing a Likert scale or prelisted factors, was to ensure that participants identified only the factors that were most important to them, free from prompting or influence by the researcher. This open-ended approach allowed respondents to provide detailed explanations, offering rich qualitative insights. This stage aimed to identify recurring themes and key factors that impact the quality of construction documents.

Respondents were selected through purposive sampling to ensure participation by experienced project managers with significant involvement in construction documentation processes. This approach aligns with the Patton (2015) assertion that purposive sampling effectively yields detailed and contextually rich data from experts in the field.

Stage 2: Semistructured Interviews

Following the analysis of the questionnaire results, the second stage involved conducting semistructured interviews with four project managers from one of the leading construction project management companies in South Africa that have been operating for over 40 years. This stage aimed to delve deeper into the themes identified in the questionnaire, to understand how key factors identified by interview participants impacted construction document quality. Semistructured interviews were chosen for their flexibility, allowing the interviewer to probe specific issues while still maintaining consistency across interviews (Kvale 2007).

The interviews were conducted either via video conferencing, lasting between 40 min and 1 h each. With the participants' consent, all interviews were recorded and transcribed for analysis. Interviewees were selected through purposive sampling, based on their availability, willingness to participate, and potential to provide particularly insightful perspectives.

Validity and Reliability

To ensure the validity and reliability of the findings, several strategies were employed throughout the research process. The questionnaire was pretested with three experienced project managers to ensure clarity and relevance, in line with Bryman (2016) recommendations for piloting survey instruments. In the interview phase, member checking was used, where participants were provided with summaries of their interview transcripts to verify the accuracy of the information (Creswell and Miller 2000). This helped to improve the credibility of the qualitative findings.

Triangulation was also employed by comparing the results from the online questionnaire and interviews. This approach helps to strengthen the findings by providing multiple data points on the same issue, thereby enhancing both internal and external validity (Patton 2015).

Data Collection

Stage 1

The online questionnaire was created using a platform called Qualtrics. At the beginning of the questionnaire, participants were provided with a background to the study and key concepts such as construction documents and quality were explained. Construction documents were defined as deliverables produced by built environment professionals for construction projects (i.e., drawings, technical specifications, reports, and bills of quantities). The concept of quality followed on from the key quality indicators suggested by Govender et al. (2022). In the context of this study, participants were

advised that good-quality professional service output (PSOs) contain a high level of accuracy, clarity, completeness, and certainty.

A purposive sampling regime was used for the online questionnaire. Participants had to satisfy the following criteria: (1) old a degree or diploma in any of the built environment professions; (2) be a registered professional with any of the recognized built environment professional councils overseeing architects, engineers, project managers, or quantity surveyors; and (3) have a minimum of 5 years of industry experience in a project management role. A total of 32 participants provided their feedback into the questionnaire. Table 2 illustrates the profile of participants.

Stage 2

Table 3 summarizes the participants interviewed and provides details about the various projects they managed, which served as the basis for the discussions. A purposive sampling approach was employed for the interviews, with more rigorous selection criteria compared to the online questionnaire. This was because interview participants were expected to provide in-depth insights into the factors influencing construction document quality, based on their experience managing mega projects in the construction industry. Interview participants were required to meet the following criteria: (1) hold a degree either in architecture, engineering, quantity surveying, or project/construction management degree; (2) be a registered professional with the South African Council for the Project and Construction Management Professions (SACPCMP); and (3) have a minimum of 20 years relevant industry experience in the project and construction management field.

Data Analysis

The qualitative data from both the questionnaire responses and interview transcripts were analyzed using thematic analysis. Thematic analysis is regarded as a rigorous and inductive process

Table 2. Profile of participants

Participant ID	Qualifications	Professional registration	Project management experience (years)	Employer
P 01	Master's degree	Pr CPM	11–20	Client (e.g., government department or parastatal)
P 02	Bachelor's degree	Pr Arch	>20	Consultant
P 03	B.Tech	Pr Eng/Pr Tech Eng	6–10	Client (e.g., government department or parastatal)
P 04	B.Tech	Pr Eng/Pr Tech Eng	>20	Consultant
P 05	National diploma	Pr Eng/Pr Tech Eng	>20	Consultant
P 06	Master's degree	Pr Eng/Pr Tech Eng	>20	Consultant
P 07	Master's degree	Pr Eng/Pr Tech Eng	6–10	Client (e.g., government department or parastatal)
P 08	Bachelor's degree	Pr Eng/Pr Tech Eng	11–20	Consultant
P 09	B.Tech	Pr CPM	>20	Consultant
P 10	Master's degree	Pr Eng/Pr Tech Eng	>20	Other
P 11	Bachelor's degree	Pr Eng/Pr Tech Eng, Pr CPM	>20	Other
P 12	Bachelor's degree	Pr Eng/Pr Tech Eng	>20	Consultant
P 13	Master's degree	Pr Eng/Pr Tech Eng	11–20	Consultant
P 14	Master's degree	Pr CPM	11–20	Contractor
P 15	B.Tech	Pr CPM	11–20	Client (e.g., government department or parastatal)
P 16	Ph.D.	Pr Eng/Pr Tech Eng, Pr QS, Pr CPM	>20	Consultant
P 17	Master's degree	Pr CPM	>20	Client (e.g., government department or parastatal)
P 18	Bachelor's degree	Pr CPM	>20	Other
P 19	Master's degree	Pr Eng/Pr Tech Eng	>20	Consultant
P 20	Master's degree	Pr Eng/Pr Tech Eng	>20	Consultant
P 21	National diploma	Pr CPM	>20	Client (e.g., government department or parastatal)
P 22	Master's degree	Pr CPM	>20	Contractor
P 23	Master's degree	Pr Eng/Pr Tech Eng, Pr CPM	>20	Consultant
P 24	Bachelor's degree	Pr Eng/Pr Tech Eng	11–20	Client (e.g., government department or parastatal)
P 25	Bachelor's degree	Pr Arch, Pr CPM	>20	Consultant
P 26	Master's degree	Pr CPM	>20	Other
P 27	Bachelor's degree	Pr Eng/Pr Tech Eng	>20	Consultant
P 28	Master's degree	Pr Eng/ Pr Tech Eng, Pr CPM	11–20	Consultant
P 29	Master's degree	Pr Eng/Pr Tech Eng	>20	Client (e.g., government department or parastatal)
P 30	B.Tech	Pr CPM	>20	Client (e.g., government department or parastatal)
P 31	Bachelor's degree	Pr Eng/Pr Tech Eng	>20	Consultant
P 32	Bachelor's degree	Pr Eng/Pr Tech Eng, Pr CPM	>20	Client (e.g., government department or parastatal)

Note: Pr Arch = professional architect; Pr CPM = professional construction project manager; and Pr Eng/Pr Tech Eng = professional engineer/professional engineering technologist.

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Table 3. Summary of interviews

Interview ID	Professional registration	Experience (years)	Interview duration (min)	Project type	Construction value (US$ million)
I01	Pr CPM	50	60	Commercial building	165
I02	Pr CPM	42	41	Commercial building	110
I03	Pr Eng Pr CPM	45	45	Commercial building	42
I04	Pr CPM	20	46	Commercial building	23

Note: Project type refers to the nature of the project discussed by the interview participant. All projects referenced were commercial building developments (i.e., buildings intended primarily for business or income-generating purposes), involving multidisciplinary teams comprising engineers, architects, and quantity surveyors. Construction value refers to the total capital cost associated with the construction project.

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designed to identify and examine themes from word-based data in a way that is transparent and dependable (Guest et al. 2012).

Braun and Clarke (2006) six-step approach was applied to identify, analyze, and report patterns or themes within the data. This method allows for the identification of key factors influencing construction document quality, including latent themes not easily captured by quantitative methods.

First, familiarization with the data involved reading through all transcripts and open-ended responses. Initial coding was then carried out to label relevant segments of the text. These codes were grouped into broader categories. Finally, these themes were reviewed and refined to ensure they accurately captured the underlying factors affecting construction document quality (Nowell et al. 2017).

Computer-Assisted Qualitative Data Analysis Software

Computer-assisted qualitative data analysis software (CAQDAS), specifically NVivo version 14, was used to code and analyze all the information provided by the participants in the study. NVivo version 14 was chosen as the most effective software for the study due to its ability to save time and organize work clearly and logically, in contrast to manual coding.

Results

Stage 1

The qualitative responses were analyzed using a thematic coding approach. The raw textual data provided by participants were carefully reviewed, and recurring ideas, patterns, and concepts were identified and labeled as codes. This process resulted in 29 distinct codes, reflecting the contributions of 32 participants and representing specific factors influencing the quality of construction documents. These codes formed the basis for further analysis.

The emergent codes identified during the data analysis are presented in Table 4. A total of 121 references were identified across the 29 emergent codes. The code "accuracy of design information" accounts for the highest number of references, with a total of 13. "Time," "competence," and "experience" each account for the second-highest number of quotations, with 11 references each. Conversely, the codes "work ethics," "motivation," "regulatory approval," "corruption," and "coordination" represent the least-cited references in the analysis, with only one citation each.

Top-Ranked Factors Influencing the Quality of Construction Documents

To determine the most significant factors influencing the quality of construction documents, the study applied a ranking threshold based on the frequency of codes among participant responses. Specifically, codes cited by 20% or more of the 32 questionnaire participants were classified as top-ranked factors. This approach allowed for the prioritization of issues that reflected a broader consensus among respondents, ensuring that recurring concerns and priorities were highlighted. By focusing on these frequently mentioned factors, the results emphasize factors with the greatest relevance and impact among participants in the study.

Similar frequency-based thresholds have been used in other qualitative research to identify dominant themes and establish the relative importance of variables (Guest et al. 2012). By adopting this method, the study maintains analytical rigor while focusing on factors with the greatest practical relevance to the industry.

Accuracy of Design Information

When project managers were asked which factors most significantly impact the quality of construction documents, the accuracy of design information emerged as a critical factor. Design information refers to all details related to the project's design plans,

Table 4. Key factors that influence the quality of project documents

Code	No. of coding references
Accuracy of design information	13
Competence	11
Experience	11
Time	11
Procurement system	9
Project brief	9
Project capital cost	7
Communication	7
Fees	5
Client competence	4
Review	4
Leadership	3
Planning	3
Tools and equipment	3
Corruption	2
Current workload	2
Motivation	2
Precision	2
Quality culture	2
Regulatory approval	2
Team composition	2
Attitude	1
Coordination	1
Dedication	1
Due diligence	1
Ethics	1
Expectations	1
Risk	1
Work ethic	1

including drawings, figures, and installation plans for essential systems like water and power lines. Both Participant 17 and Participant 30 emphasized the importance of accuracy in design information, agreeing that it is fundamental to ensuring high-quality project outcomes. Participant 17 highlighted the role of contractors and employers in ensuring this accuracy:

> The preamble to this starts with professional service providers (PSPs) employed by Contractors and then the explanation extends to design by employer.

Participant 30 underscored various aspects of design information, including the quality and completeness of design-related documents:

> [. . .] the quality of all documents produced for the projects such as design reports, design documentation, tender documents.

Time

A clearly defined project brief and adequate time allocation are essential to producing high-quality project documents. A project brief outlines the design, time frame, objectives, deliverables, and key stakeholders, providing clarity on the scope and vision of the project. This understanding enhances the quality of outputs and ensures better alignment between contractors and clients. Participant 27 stressed the importance of allocating sufficient time to avoid errors:

> Do not rush, allocate sensible time limits [. . .] When people say there is not enough time for checking, remind them that there is always time for correcting/fixing failures.

Several participants also identified time as a critical factor, often referencing it succinctly:

> "Time allowed" (Participant 4).

> "Time" (Participants 7 and 16).

Competence

The competence of service providers was frequently cited as a decisive factor in determining the quality of project documents. Competence involves technical expertise, experience, and the ability to translate client requirements into effective project outputs. Participant 6 highlighted the importance of a professional team's expertise and familiarity with the client's field:

> A professional team that is very well acquainted with the client's business/field of activity. Notwithstanding the above, PSOs are 'consultants' and by definition must understand the pertinent field as well or better than the clients they serve. Tech competence in the field is taken as a given.

Participant 23 added that competence includes understanding the project's minimum requirements and performance criteria:

> Understanding the minimum requirements to fully define the scope of work and all performance criteria to achieve success.

Experience

The experience of both the individual workers and the contracting company was another significant factor influencing project quality. While experienced companies bring extensive knowledge and a proven track record, newer companies may offer innovative techniques. Participant 3 suggested that a balanced team comprising experienced and less experienced professionals often produces the best outcomes:

> Competent and appropriately qualified professional team with a mix of 'experienced' and 'less experienced' professionals.

Participants 11 and 13 focused specifically on the experience of the designer as being critical to quality:

> "Experienced design manager" (Participant 11).

> "Experience of the designer" (Participant 13).

Participant 22 highlighted that experience with similar projects contributes to greater accuracy:

> Experience in similar works.

Project Brief

A well-structured project brief is essential for project success. It provides a comprehensive overview of the project design, time frame, objectives, deliverables, and key stakeholders, ensuring clarity and alignment among all parties. This fosters efficient execution and helps manage expectations. Participant 26 emphasized the importance of defining the scope of work and outcomes clearly:

> Definition of Scope of Work and finished product by the Employer.

Procurement System

Effective procurement systems were identified as essential for ensuring the smooth running of projects. These systems should include performance management structures to monitor contractor outputs and enforce accountability. Participant 5 mentioned using key performance indicators (KPIs) to enhance accountability:

> Key performance indicators and measurements.

Participants also stressed the need for rigorous contractor screening during procurement to ensure a balance between cost, skills, and deliverables:

> Mechanism of procurement of professional services—ensuring that there is appropriate balance between cost competitiveness and minimum skills and deliverables required.

Project Capital Cost

Budgetary constraints were consistently highlighted as a major challenge affecting the quality of project documents. Limited budgets can lead to compromises in material quality, labor availability, and timelines, ultimately reducing project quality. Participant 4 noted the importance of aligning project budgets with timelines:

> Approved budget relating to hours available.

Communication

Effective communication was seen as a key driver of success in project management. Clear communication reduces misunderstandings, aligns goals, and fosters collaboration. Participant 14 highlighted the importance of managing client expectations:

> Communicated expectations from client.

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Participant 5 emphasized stakeholder engagement as a factor that improves the quality of construction documents:

> Stakeholder engagement.

Stage 2

The second stage of the research design was used to validate the top factors from the questionnaire in Stage 1 to determine key factors influencing construction document quality. The results from the interviews are presented below.

Competence

The importance of competence as a critical factor influencing the quality of construction documents was highlighted by two participants, I01 and I04. Participant I01 emphasized that competence is an underlying assumption for any successful project, yet noted that the industry often struggles with consultants who lack the necessary expertise:

> So that, to me is the fundamental, and it's all about proper coordination of design at the right place and the right time, assuming a given that you've got competent consultants working for you. And unfortunately, there's a lot of incompetent consultants out there that we have to deal with, which makes our lives a lot more difficult.

Participant I04 echoed the sentiment, emphasizing that the success of their project was heavily dependent on the consultants' competence and their in-depth understanding of the project requirements and market conditions. I04 elaborated on the positive impact of working with a highly skilled team of consultants who brought valuable expertise and industry knowledge to the project:

> From a professional team perspective, we were fortunate to have highly competent consultants on board. The consultants we selected were not only well-known in the industry, but they had also built a solid reputation over the years. Their competence was evident in their deep knowledge and expertise, which was crucial to the success of the project. They need to have a solid understanding of the market and the nuances of the type of construction you're doing. So, ensuring that you bring in consultants with the right competence and background is key to a smooth and successful project.

Procurement System

The issue of competence was closely tied to the procurement system and raised by participant I01 and I04. According to I01, the perceived poor quality of work in public sector projects in South Africa can be largely attributed to the procurement methods used for hiring consultants. I01 argued that these methods often result in appointing individuals or firms lacking the necessary expertise, creating a cycle of inefficiency and incompetence:

> There is a perception that the quality of work delivered by professionals on public sector projects in South Africa is very poor. I believe this is largely due to the procurement methods used to hire consultants. I think there's a definite lack of competence in the Government sector, in terms of know-how and knowledge of project delivery. And because of that, the wrong people appointed to provide services to them. So it's like almost like a pack of cards you know, is like incompetence breeds incompetence, which breeds incompetence, are you with me? And it's not intended to be derogatory . . . it's so fraught with politics and other wrongful influences that the wrong people get appointed most of the time for the wrong reasons.

I04 also highlighted the importance of selecting the right consultants at the outset of projects, pointing out that competence begins at the selection process. I04 emphasized that consultants should not only have the technical skills for the job but also a deep understanding of the specific sector in question, such as residential construction:

> I believe competence starts right from the selection process – choosing consultants who have the right experience and skills for the specific project is essential. It's important to work with professionals who not only understand the technical aspects but also have a strong grasp of the specific sector, such as residential construction in this case.

Time

Time management emerged as a crucial factor in the successful delivery of construction documents, according to Participant I02. I02 stressed that effective time management and maintaining a well-organized project schedule are foundational to ensuring the quality of documentation. The participant explained that a structured approach to managing time and tasks from the outset plays a key role in guiding the professional team throughout the project:

> In my experience, time management and effectively managing the project programme are the most important factors that influence the quality of construction documents. The professional team needs to be organized and guided by a well-thought-out documentation programme from the outset.

I02 further illustrated this point by describing how a clear program was implemented early on to manage the flow of tasks and information. By sequencing the tasks correctly and prioritizing information flow before the contractor's involvement, the professional team was able to ensure a smoother process once the contractor was on board:

> A clear documentation programme was in place, with the information flow sequenced correctly before the contractor was involved. Once the contractor came on board, they were managed in a way that ensured their information demands were appropriately prioritized, minimizing disruption to the professional team and helping maintain control over the documentation process.

Additionally, I02 noted the potential consequences of failing to prioritize tasks effectively. Without clear guidance on what tasks should take precedence, the professional team may struggle to stay on track, ultimately affecting the quality of the construction documents:

> Without clear guidance on how to prioritize the information, the professional team ends up relying on their own judgment to figure out what's most important. This lack of clarity creates confusion, which impacts the quality of the construction documents and hinders the team's ability to stay on track.

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Accuracy of Design Information

The accuracy of design information is critical to the success of a project, as mentioned by Participant I03. I03 highlighted that ensuring all team members are working with the most up-to-date and accurate information is essential to prevent errors and delays. Regular communication and collaborative meetings were key strategies used by I03 to keep everyone aligned and to address any potential issues proactively:

> In my experience, it's all about making sure everyone is on the same page and working with the most accurate and up-to-date information. For example, we held regular planning meetings, at least every two weeks, where we checked in on the project's progress, addressed any issues, and made sure that everyone knew exactly what needed to be done. But the most important part was ensuring that all design information was reviewed and kept accurate throughout the project.

I03 also emphasized that design information is not static and may change over the course of a project. Therefore, continuous alignment between all team members—architects, engineers, contractors, and project managers—is crucial to avoid mistakes. Regular site meetings and inspections were used to ensure that the work being done on-site was consistent with the design documents, allowing the team to spot and resolve discrepancies early on:

> The design information can change over time as the project evolves, and it's crucial that the architects, engineers, contractors, and project managers are always aligned. If one team doesn't have the latest information, it can lead to mistakes or delays. To keep everyone in the loop, we also had regular site meetings and inspections. These helped us make sure that the work being done on-site matched the design documents, and allowed us to spot any discrepancies early. By catching those issues in real-time, we could correct them before they became bigger problems.

Communication

Effective communication was identified as a key factor in ensuring the quality of construction documents. Both I01 and I03 stressed the importance of clear, timely communication among the design consultants and the project team. I01 succinctly captured the essence of quality documentation by linking it directly to communication, stressing that its effectiveness hinges on the right information being shared at the right time:

> Well, look, the quality of documentation is really, if you boil it down to basics, it's all about communication by the design consultants at the right place and at the right time.

I03 further reinforced this idea, asserting that without proper coordination and communication, documentation can become inaccurate, ultimately impacting the project's progress. I03's experience showed that maintaining constant communication and ensuring the accuracy of design information were crucial to keeping the construction documents on track and the project moving smoothly:

> Without effective coordination, the documentation can quickly become inaccurate, leading to issues down the line. By staying in constant communication and prioritizing accurate design information, we were able to maintain the quality of the construction documents and keep the project moving forward smoothly.

Discussion

This study investigated the key factors influencing the quality of construction documents, utilizing a two-stage research design. The five key factors identified were competence, procurement system, time, accuracy of design information, and communication.

Competence refers to the skills, qualifications, and ability of the professionals involved in construction projects to deliver an expected level of quality. This factor is crucial because competent professionals are better equipped to produce accurate, clear, and comprehensive documentation, which serves as a foundation for good project outcomes. Interestingly, only one previous study by Wimalasiri et al. (2010) directly identified competence as a key factor influencing document quality. Other studies (e.g., Bubshait et al. 1999; Dosumu and Iyagba 2013; Dosumu et al. 2017; Assaf et al. 2018) highlighted experience as a critical factor. It could be argued that competence and experience are related concepts because both reflect an individual's ability to perform their duties effectively. However, they are distinct: experience refers to the knowledge and skills gained through practice over time, while competence includes both experience and formal training, as well as the ability to apply this knowledge effectively. Thus, competence provides a more holistic assessment of a professional's capacity to deliver high-quality construction documents.

The procurement system and the selection of competent consultants was identified as a key factor influencing the quality of construction documents. This finding is unique to this study and was not emphasized in prior research. However, the challenges associated with South Africa's procurement system have been previously discussed by Govender et al. (2025). The South African procurement system's focus on awarding contracts based on the lowest fees, rather than prioritizing the quality, experience, and competence of consultants, has contributed to a perception among industry stakeholders that the quality of construction documents is deteriorating. This study highlights the need to assess the effectiveness of current procurement practices and potentially reform the procurement system to place greater importance on consultant selection based on expertise and competence. Addressing this issue could help reverse the perceptions around declining document quality and improve project outcomes, particularly in the public sector.

Time was also identified as a key factor in this study and has been widely discussed in previous research (e.g., Tilley and McFallan 2000; Minato 2003; Darwish 2005; Slater and Radford 2012; Zidan 2013; Dosumu et al. 2017; Akampurira and Windapo 2018). Time is critical in construction projects because adequate time allocation and effective time management allow professionals to carefully plan, coordinate, and execute tasks. When time is managed effectively, construction professionals have the opportunity to review and refine construction documents, reducing errors and ensuring clarity. Conversely, tight or unrealistic project timelines can compromise the quality of construction documents, as professionals may rush their work or overlook critical details. This study highlights the importance of proper scheduling and the allocation of sufficient time to each phase of the documentation process to achieve the desired quality standards.

Accuracy of design information was another key factor identified in the study, aligning with findings from Zidan (2013) and Fatawu et al. (2020). Notably, both studies were conducted in developing countries, which suggests that inaccuracies in design information may be a common challenge in developing construction markets. The accuracy of design information is essential because construction documents serve as a reference point for all stakeholders. Inaccuracies can lead to costly mistakes, project delays, and

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disputes during construction. This study highlights the need for stringent quality control measures and regular reviews of design information to minimize errors and ensure alignment between project stakeholders throughout the project life cycle.

The final key factor identified was communication, which was previously noted by Assaf et al. (2018). While not extensively discussed in prior studies, it is unsurprising that communication emerged as a key factor in this study, given that it forms the basis of effective project management. Communication is a vital competency among project managers, who were the participants in this study, and plays a pivotal role in maintaining the quality of construction documents. Effective communication ensures that all project stakeholders, including architects, engineers, and contractors, are aligned and working toward shared objectives. Miscommunication or a lack of communication can lead to misunderstandings, errors, and delays, which ultimately compromise document quality. This study highlights the importance of fostering open and consistent communication channels to facilitate information sharing, improve coordination, and maintain the accuracy of documentation throughout the project.

The key factors identified in this paper provide valuable guidance for project stakeholders aiming to enhance document quality in the construction industry. The insights gained from this study can assist policymakers, project stakeholders, and industry leaders in implementing strategic reforms and best practices. By emphasizing the importance of competence, the paper highlights the need for appointing skilled and qualified professionals to projects. Additionally, the issues raised regarding the procurement system underscore the need for reforms to ensure that professionals are selected based on their expertise and competence rather than cost alone. Factors such as communication, accuracy of design information, and time management highlight the necessity of robust project management strategies to ensure these factors are adequately managed on projects.

It is important to note that the data in this study are limited to the perspectives of project managers within the South African construction industry. Nevertheless, the findings are generalizable to other developing countries that deliver large-scale infrastructure projects. Many developing nations experience procurement issues where cost considerations often take precedence over quality, leading to poor documentation. Moreover, the key factors of competence, time management, communication, and accurate design information are universally relevant when dealing with improvements to construction document quality. The systemic issues identified in South Africa—particularly those related to procurement practices and the need for competent professionals—are applicable to other developing countries where competitive tendering is prevalent and firms limit the involvement of skilled professionals to maintain financial competitiveness.

Conclusion

This study sought to identify the key factors influencing the quality of construction documents, a foundational aspect of successful project outcomes. Using a two-stage research design, the study drew on insights from an online questionnaire consisting of 32 project managers and interviews with four highly experienced project managers, whose careers spanned 20 to 50 years.

The study identifies five core factors—competence, procurement systems, time management, accuracy of design information, and communication—as central to the provision of quality construction documents. Among these, professional competence is highlighted as the most influential, reinforcing the global need for highly qualified personnel in project delivery. Uniquely, the research exposes systemic flaws in South Africa's cost-based procurement practices, which often prioritize price over quality, offering a critical regional insight with potential relevance to other emerging markets facing similar challenges.

This study advances the global body of knowledge in construction engineering and management by offering a nuanced, project manager–centered understanding of the factors that influence construction document quality—an area that has received limited scholarly attention to date. The research captures deep qualitative insights from project management professionals with decades of experience. For academia, this research sets a foundation for future research into practical project-level factors affecting quality in the construction industry. For industry, it delivers a list of key factors impacting construction document quality that should be used to mitigate risks related to poor documentation, improve project performance, and inform policy reforms—both in South Africa and in comparable global contexts.

Data Availability Statement

Some or all data, models, or code generated or used during the study are proprietary or confidential in nature and may only be provided with restrictions.

Acknowledgments

This research was supported by the Construction Industry Development Board of South Africa.

Author Contributions

Neil Govender: Writing – original draft; Writing – review and editing. Samuel Laryea: Writing – review and editing. Ron Watermeyer: Writing – review and editing.

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