Technologique | 2026, Vol. 7, No.1, 104 – 122 | ISSN Online: 3028-1415 | ISSN Print: 3028-1407
DOI: https://doi.org/10.62718/vmca.tech-gjtdsi.7.1.SC-0226-023

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Factors Affecting Project Quality During Construction Phase of Government Building Projects in the NCR: Developing an Implementation Plan for Improved Public Services Delivery

Article History:

Initial submission:	08 February 2026
First decision:	13 February 2026
Revision received:	10 March 2026
Accepted for publication:	15 March 2026
Online release:	17 March 2026

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Abstract

Government building projects in the National Capital Region (NCR) face persistent quality challenges that affect safety, functionality, and public trust. This study investigates the factors influencing construction-phase quality, focusing on leadership, people, policy and strategy, partnership and resources, and process. A descriptive research design was employed, using a structured survey administered to 45 technical personnel from general contractors managing Department of Public Works and Highways (DPWH) projects. Stratified random sampling ensured representation across roles and experience levels. Data were analyzed using frequency distribution, weighted mean, standard deviation, ranking, and one-way ANOVA to assess perceptions and identify significant differences. Process-related factors received the highest evaluation, particularly coordination among project teams (WM = 4.57), site inspection (WM = 4.55), and quality control (WM = 4.53). People-related factors such as teamwork and training also ranked highly, underscoring workforce competence as vital to quality outcomes. Leadership commitment and proactive change management were influential, while resource constraints and policy gaps contributed to deficiencies. ANOVA results indicated no significant differences in perceptions across age, designation, or experience, suggesting shared recognition of these factors across demographics. Findings highlight the critical role of process integration, workforce development, and leadership support in ensuring construction quality. Addressing resource limitations and policy inconsistencies can further strengthen outcomes. Improving government building project quality requires coordinated processes, skilled personnel, and strong leadership. The study proposes an implementation plan emphasizing inspection, training, and stakeholder collaboration to enhance public service delivery.

Keywords: government building projects, construction quality, leadership, process management, National Capital Region (NCR)

INTRODUCTION

The construction industry is a cornerstone of Philippine economic growth and public service delivery, primarily through the Department of Public Highways and Works (DPWH) (Siman, 2023; Department of Public Works and Highways, n.d.). However, the sector consistently faces quality-related issues, including material defects, poor workmanship, and non-compliance with specifications, which lead to safety hazards and diminished public trust (David et al., 2021; Marcelo, 2020; Gurmu & Mahmood, 2024). These failures are often driven by inadequate site supervision, a lack of skilled labor, and weak management practices (Durdyev & Hosseini, 2020; Layno & Famadico, 2024; Sin et al., 2024). Locally, oversight gaps and ineffective contractor practices have resulted in the cost overruns and defective projects frequently highlighted by the Commission on Audit (COA) and media reports (Mangaluz, 2024; Shabbir et al., 2023).

The National Capital Region (NCR) presents a uniquely complex environment due to high project volume, aggressive timelines, and multi-stakeholder involvement, yet empirical research specific to this region remains scarce (Khan et al., 2021; Qi et al., 2021; Yaman et al., 2022). While Total Quality Management (TQM) and strong leadership are known to optimize resource use and reduce defects, there is a pressing need for localized, evidence-based

implementation plans (Desta et al., 2023; Jacob & Kelvin, 2025; Uyanwatta, 2024). This study addresses these gaps by evaluating quality-affecting factors in NCR government building projects through literature reviews and surveys of general contractors' technical personnel. The ultimate goal is to develop a practical framework to enhance construction quality and improve the reliability of public infrastructure (Wawak et al., 2020; Alfalah et al., 2023).

LITERATURE REVIEW

Construction Quality and Project Success. In construction, quality is defined as the fulfillment of technical, safety, and functional requirements, representing long-term value and serviceability beyond mere adherence to time and cost constraints (Project Management Institute [PMI], n.d.; Wawak et al., 2020). Building performance relies heavily on compliance with design specifications during execution, as construction-phase deficiencies can shorten service life and escalate maintenance costs (Alfalah et al., 2023; Asefa, 2022). Effective management, including leadership knowledge, human resource planning, and adherence to quality objectives, is vital for success, whereas poor quality results in rework, repairs, and financial inefficiencies (Alabdulmunem, 2020; Aenet & Maniha, 2023; Khadim et al., 2023; Durdyev & Hosseini, 2020). Common hindrances to quality include weak supervision, insufficient inspection, and the technical incompetence of workers, which lead to recurring errors and non-compliance (Getu et al., 2021; Hijazi, 2021; Mat Salleh et al., 2022; Govindaraj et al., 2022). Furthermore, substandard material control, communication gaps between stakeholders, and late design changes significantly degrade structural durability (Sin et al., 2024; Sitota et al., 2021; Qi et al., 2021; Khan et al., 2021). Subcontractor risks—encompassing financial, resource, and managerial factors—also impact performance, while external constraints like financial instability and compressed schedules further compromise workmanship (Adinyira et al., 2020; Bitamba & An, 2020; Masoetsa et al., 2022). Within the Philippines, these implementation challenges are reflected in frequent reports of quality concerns in public infrastructure (Marcelo, 2020; Mangaluz, 2024).

Quality Management in Government Building Projects. The adoption of Total Quality Management (TQM) in public construction remains inconsistent, as quality principles often fail in practice due to inadequate personnel training, inefficient monitoring, and a lack of regular internal audits (Desta et al., 2023; Osegbo et al., 2021). Strong management commitment and consistent oversight are vital to strengthening the performance of government buildings (Jacob & Kelvin, 2025). Critical quality risk factors identified in similar contexts include improper inspection procedures, poor stakeholder coordination, flawed design documents, inadequate construction methods, and substandard materials (Phan et al., 2022). These deficiencies directly impair the operations of government facilities, underscoring the link between construction performance and public service delivery (Aenet & Maniha, 2023). While the Philippines maintains established standards through the Department of Public Works and Highways (DPWH, n.d.), adherence depends heavily on effective supervision and contractor performance. Ultimately, systemic flaws—such as poor inspection planning and the failure to integrate quality assurance with site operations—must be addressed through rigorous testing and systematic monitoring to prevent quality failures (Lee & Yu, 2024).

Factors Affecting Quality in Construction Projects. Quality performance in building construction projects is affected by managerial, technical, and organizational factors during project implementation. Studies have shown that leadership practices, workforce capability, institutional systems, resource availability, and operational procedures all work together to determine construction quality (Wawak et al., 2020; Gurmu & Mahmood, 2024). Referring to the conceptual framework of Aenet and Maniha (2023), Leadership, People, Policy and Strategy, Partnership and Resources, and Process are the main categories that influence the quality of construction projects.

Leadership-related Factors. Leadership sets the project's direction to quality and ensuring its compliance the standards set at all times during the project's life cycle. Management commitment influences how rigorously quality procedures are applied, how quickly issues are addressed, and whether corrective actions are implemented effectively (Alabdulmunem, 2020; Lee & Yu, 2024). Project implementation teams more likely to adhere to standards when their upper management set high priority for quality. Effective leadership also strengthens coordination among project participants. Contractors, consultants, and inspectors can communicate more effectively when project managers and engineers provide clear instructions. This helps to prevent misunderstandings that could result in defects (Wawak et al., 2020). However, poor supervisory control and delayed decision-making frequently lead to inconsistent work practices and overlooked non-conformances (Hijazi, 2021). Strong leadership is even more crucial to maintaining quality compliance in public construction settings, where administrative procedures can impede technical decisions.

People-related Factors. The technical proficiency, experience, and specialized knowledge of construction and oversight personnel are fundamental determinants of project quality, as a lack of these skills frequently leads to costly rework and substandard workmanship (Mat Salleh et al., 2022; Govindaraj et al., 2022). Competent inspection and supervision are equally vital; inadequate oversight allows errors to remain undetected until they become expensive and disruptive to correct (Getu et al., 2021). Consequently, continuous training and professional development are essential for maintaining performance standards (Gurmu & Mahmood, 2024). This is particularly critical in government projects, where high labor turnover and a shortage of qualified quality control staff often undermine construction integrity (Aenet & Maniha, 2023).

Policy and Strategy-related Factors. Strategic approaches and organizational policies are fundamental to the consistency of quality management in construction. Formal systems with documented procedures and clear objectives provide a necessary framework for inspection planning, testing, and handling non-conformances (Wawak et al., 2020; Lee & Yu, 2024). Effective strategic planning further mitigates execution complications by identifying technical risks and feasibility issues early, whereas poor planning and ambiguous specifications frequently lead to construction errors and variations (Nyabero et al., 2025; Khan et al., 2021). Furthermore, public sector procurement practices that prioritize the lowest bid over contractor capability often inadvertently increase the risk of substandard quality outcomes (Layno & Famadico, 2024).

Partnership and Resources-related Factors. Attaining desirable construction standards depends heavily on resource availability and robust stakeholder collaboration. Material quality is a primary determinant of structural reliability, yet inadequate testing and inspection protocols frequently increase the risk of using substandard materials (Yaman et al., 2022). Financial stability is equally critical, as contractors facing budget constraints often struggle to procure compliant materials, maintain equipment, or retain the skilled labor necessary for high-quality outcomes (ALDhaheri, 2025; Bitamba & An, 2020). Furthermore, the availability of equipment and proper testing facilities is essential for conducting timely inspections (Masoetsa et al., 2022). Beyond physical resources, effective collaboration among designers, contractors, and consultants ensures accurate plan interpretation and the swift resolution of technical issues, whereas poor coordination invariably leads to inconsistent specification implementation and increased rework (Qi et al., 2021; Wawak et al., 2020; Aenet & Maniha, 2023).

Process-related Factors. Technical and administrative construction processes form the bedrock of quality management, where standardized inspection systems and regular material testing ensure compliance with design and regulatory requirements (Yaman et al.,

2022). Failures in inspection planning and documentation are primary contributors to quality issues, emphasizing the need to integrate quality control activities—such as regular monitoring and real-time reporting—into daily site operations to detect deviations early (Lee & Yu, 2024; Wawak et al., 2020). Process breakdowns, particularly poor coordination of design revisions, often lead to errors requiring significant rework and resources (Khan et al., 2021; Gurmu & Mahmood, 2024). Ultimately, construction quality is a multidimensional outcome influenced by Leadership, People, Policy and Strategy, Partnership and Resources, and Process (Aenet & Maniha, 2023; Gurmu & Mahmood, 2024; Wawak et al., 2020). Addressing deficiencies across these grouped factors is essential for evaluating quality challenges and developing targeted improvement strategies to ensure design plans are successfully translated into physical structures (Alabdulmunem, 2020; Alfalah et al., 2023).

Theoretical Framework. Research identifies construction quality as a product of people, processes, and resources, with statistical analyses like one-way ANOVA confirming that clients, contractors, and consultants generally share the same perceptions across five key attributes: leadership, people, policy and strategy, partnership and resources, and process (Aenet & Maniha, 2023; Osegbo et al., 2021; Sin et al., 2024; Desta et al., 2023). To clarify these relationships, scholars have utilized Structural Equation Modeling (SEM) to categorize factors into the quality of organization, processes, and results, demonstrating how these pillars collectively dictate project outcomes (Wawak et al., 2020). Furthermore, frameworks influenced by the European Foundation for Quality Management (EFQM) model establish a hypothetical structure where Leadership, Policy and Strategy, People, Partnership and Resources, and Process serve as independent variables directly influencing the dependent variable of Project Quality (Aenet & Maniha, 2023; Alabdulmunem, 2020; Alfalah et al., 2023; Gurmu & Mahmood, 2024).

Conceptual Framework. This study focuses on evaluating the factors influencing the quality of selected government building projects throughout the construction phase (Aenet & Maniha, 2023; Gurmu & Mahmood, 2024; Yaman et al., 2022). The conceptual framework utilizes the respondent profiles and the identified quality-affecting factors as inputs (Mangaluz, 2024; Layno & Famadico, 2024), while the process involves systematic data collection via surveys followed by statistical analysis and hypothesis testing. Ultimately, this framework is designed to produce a proposed implementation plan for construction quality management, specifically tailored for the execution of government building projects.

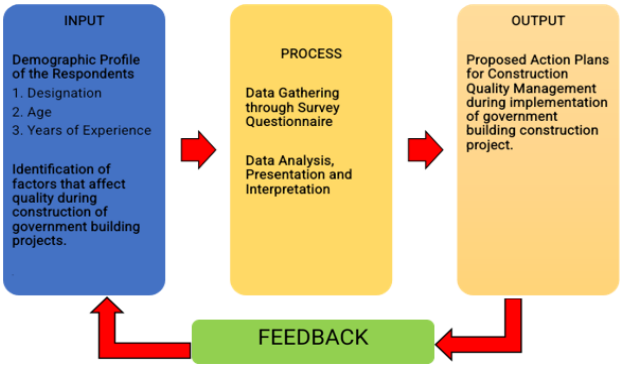

Figure 1
Conceptual Framework of the study

Government building projects in the National Capital Region are designed to enhance public service delivery, yet they are frequently beset by quality-related controversies and technical issues (Law Insider, n.d.; Hayes, 2023; David et al., 2021; Gurmu & Mahmood, 2024). These projects are inherently complex as they must balance specific end-user requirements with broader public interests (Alabdulmunem, 2020; Wawak et al., 2020). Consequently, general contractors involved in implementation must possess a comprehensive understanding of the factors affecting project quality and demonstrate proficiency in management to ensure objectives regarding cost, quality, and long-term serviceability are met (Yaman et al., 2022; Alfalah et al., 2023).

Drawing from established research on construction quality management and project

performance, this study seeks to address critical gaps in the field (Gurmu & Mahmood, 2024; Wawak et al., 2020; Yaman et al., 2022) by addressing the following questions:

1. What are the factors affecting project quality during the construction phase of government building projects in the National Capital Region in terms of:
   1.1 Leadership;
   1.2 People;
   1.3 Policy and Strategy;
   1.4 Partnership and Resources; and,
   1.5 Process?

2. What factors significantly affect project quality during the construction phase of government building projects as perceived by respondents when grouped according to:
   2.1 Age;
   2.2 Role/Designation; and,
   2.3 Years of Experience?

3. Is there significant differences in the perception of respondents regarding the factors affecting project quality during the construction phase of government building projects when grouped according to:
   3.1 Age;
   3.2 Role/Designation; and,
   3.3 Years of Experience?

4. What action plans can be developed to improve construction quality management and ensure the achievement of quality objectives in government building projects during the construction phase?

Hypotheses. This study aimed to identify the significant factors that affect the quality of government building projects during the construction phase (Aenet & Maniha, 2023; Gurmu & Mahmood, 2024; Yaman et al., 2022). The following statements outline the anticipated relationships between these variables that affect the quality of government building projects during the construction phase (Alabdulmunem, 2020; Alfalah et al., 2023). Both null and alternative perspectives were provided to offer a comprehensive basis for analysis.

H_0: There is no significant difference in the perception of respondents regarding the factors affecting the quality of government building projects during the construction phase when grouped according to age, role/designation, and years of experience.

H_1: There is a significant difference in the perception of respondents regarding the factors affecting the quality of government building projects during the construction phase when grouped according to age, role/designation, and years of experience.

METHODS

Research Design. This study is a descriptive research which aimed to examine the factors affecting the quality of government building projects during the construction phase in the National Capital Region (NCR) (McCombes, 2023). It aims to identify and describe the population or phenomenon without manipulating variables (McCombes, 2023). In addition, the study examined patterns and relationships on how the respondents perceived the quality factors that affect a government building project. This approach is widely applied in construction management research focusing on quality, performance, and project success (Aenet & Maniha, 2023; Gurmu & Mahmood, 2024; Lee & Yu, 2024).

Population and Sampling. The target population of the study consisted of 45 technical personnel from general contractors overseeing government building projects implemented by the DPWH-UPMO-BSPMC and DPWH-NCR District Engineering Offices. To account for diverse roles and experience levels, the study employed stratified random sampling, utilizing the Stat Trek Random Number Generator (Berman, n.d.) to ensure an unbiased selection process where every member has an equal opportunity for inclusion (McCombes, 2023). The respondents were specialized professionals responsible for project integrity, including Project Managers, who oversee budget and standards compliance (Aenet & Maniha, 2023; Alabdulmunem, 2020); Construction Managers,

who coordinate site operations (Gurmu & Mahmood, 2024; Wawak et al., 2020); and Projects-In-Charge, who ensure adherence to contract conditions. The sample also includes Field Engineers responsible for monitoring progress and Materials/Quality Control Engineers, who are specifically tasked with implementing quality control plans and witnessing material testing to verify that all work meets established project specifications.

Instrumentation. This study utilized a structured survey questionnaire developed from an extensive literature review to collect quantitative data on factors affecting construction quality in the National Capital Region (Aenet & Maniha, 2023; Alfalah et al., 2023; Gurmu & Mahmood, 2024). The instrument, grounded in established management and performance frameworks, categorized 52 specific factors into five critical domains: Leadership, People, Policy and Strategy, Partnership and Resources, and Process (Aenet & Maniha, 2023; Desta et al., 2023; Osegbo et al., 2021; Sin et al., 2024). The questionnaire was divided into two sections: the first captured respondent demographics including age, role, and experience, while the second evaluated 52 factors using a 5-point Likert scale, ranging from 5 (Strongly Agree) to 1 (Strongly Disagree), to measure the respondents' perceived importance of quality performance during the construction phase.

Data Gathering Procedure. The research procedure began with a comprehensive review of international and local literature to identify and classify the major factors affecting construction quality, providing the foundation for a research instrument aligned with the study's theoretical framework (Aenet & Maniha, 2023; Alfalah et al., 2023; Gurmu & Mahmood, 2024). This resulted in a structured questionnaire consisting of two sections: one for demographic data and another evaluating quality factors across five categories using a five-point Likert-type scale, ranging from strongly disagree to strongly agree (McCombes, 2023). The survey was distributed through both physical and virtual channels to randomly selected technical personnel from general contractors managing DPWH–UPMO–BSPMC and DPWH–NCR projects.

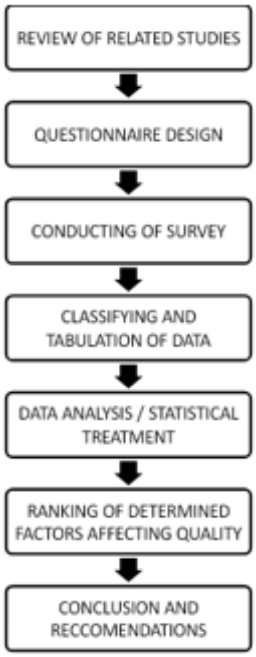

Figure 2
Process Flow diagram

Data Analysis. Following data classification and tabulation, statistical treatments were applied to evaluate the significance of factors affecting project quality and performance. Percentage distribution analyzed the respondent profiles as to age, role, and experience, while weighted mean assessed the perceived impact of identified quality factors. To determine if demographic characteristics significantly influence these perceptions, a one-way analysis of variance (ANOVA) was conducted using SPSS software (Chatzi & Doody, 2023; Ntumi, 2021). This method compared the means across three or more independent groups to identify any statistically significant differences between them (Laerd Statistics, n.d.), thereby verifying whether the respondents' professional backgrounds or age affect their evaluation of the construction quality factors.

RESULTS

Factors affecting project quality during the construction phase of government building projects in the National Capital Region.

Table 1

Assessment of factors affecting project quality in NCR government building projects

Rank	Quality Factor	Description	Weighted Mean	Interpretation
1	PROCESS	Level of coordination between project team members	4.57	Strongly Agree
2	PROCESS	Inadequate site inspection of materials and equipment	4.55	Strongly Agree
3	PEOPLE	Teamwork extent of parties involved in the construction	4.53	Strongly Agree
4	PROCESS	Poor quality control and assurance procedures	4.53	Strongly Agree
5	PROCESS	Quality of drawings and specifications received from the designer	4.49	Strongly Agree
6	PROCESS	Poor on-site supervision	4.49	Strongly Agree
7	POLICY AND STRATEGY	Poor planning and scheduling during the construction phase	4.47	Strongly Agree
8	PARTNERSHIP AND RESOURCES	Scarcity of skilled labor	4.45	Strongly Agree
9	LEADERSHIP	Extent of management leadership in promoting quality	4.38	Strongly Agree
10	PEOPLE	Lack of training and development among the project team members	4.38	Strongly Agree
11	LEADERSHIP	Planning and detailing different stages of change in the project	4.36	Strongly Agree
12	PROCESS	Quality of comprehensive documentation	4.34	Strongly Agree
13	PARTNERSHIP AND RESOURCES	Low quality and poor availability of materials	4.34	Strongly Agree
14	PROCESS	Design changes	4.32	Strongly Agree
15	PROCESS	Conformance to specifications, codes, and standards	4.32	Strongly Agree
16	PARTNERSHIP AND RESOURCES	Labor productivity and competency	4.30	Strongly Agree
17	LEADERSHIP	Existence of conflicts between project partners	4.30	Strongly Agree
18	LEADERSHIP	Level of management commitment to promote continuous quality improvement	4.30	Strongly Agree
19	PEOPLE	Assigned technical personnel on-site lacks experience	4.28	Strongly Agree
20	LEADERSHIP	Unawareness of proper planning tools and techniques by the Project Manager	4.28	Strongly Agree
21	LEADERSHIP	Measurement and review of effectiveness of quality management plan	4.26	Strongly Agree
22	PEOPLE	Shortage of available technical personnel	4.26	Strongly Agree
23	POLICY AND STRATEGY	Existence of systematic procedures to plan, evaluate, and control project goal achievement	4.21	Strongly Agree
24	PROCESS	Poor quantification of materials/equipment needed	4.21	Strongly Agree
25	PROCESS	Insufficient attention to safety and disaster prevention	4.21	Strongly Agree
26	PROCESS	Errors or omissions in construction work	4.17	Agree
27	PROCESS	Efficient behavior patterns through a work process	4.17	Agree
28	PARTNERSHIP AND RESOURCES	Level of supplier involvement in the construction process	4.15	Agree
29	PARTNERSHIP AND RESOURCES	Improper allocation of equipment and materials	4.15	Agree
30	PEOPLE	Efficiency of planning and managing human resources	4.15	Agree
31	PARTNERSHIP AND RESOURCES	Level of subcontractor responsibility	4.13	Agree
32	PARTNERSHIP AND RESOURCES	Frequent equipment breakdown	4.11	Agree
33	POLICY AND STRATEGY	Absence of benchmarking techniques and clear uniform evaluation standard	4.06	Agree
34	PARTNERSHIP AND RESOURCES	Optimistic time expectations	4.06	Agree
35	PROCESS	Change / variation orders	4.06	Agree
36	PEOPLE	Promotion of labor welfare	4.04	Agree
37	PARTNERSHIP AND RESOURCES	Escalation of material prices	4.04	Agree
38	PARTNERSHIP AND RESOURCES	Allocation of financial resources	4.04	Agree
39	PROCESS	Efficiency of measuring the level of project performance	4.02	Agree
40	PEOPLE	Lack of project team motivation	4.02	Agree
41	PARTNERSHIP AND RESOURCES	On-time material delivery	4.00	Agree
42	PROCESS	Lack of auditing system	4.00	Agree
43	LEADERSHIP	Lack of participation of managerial level in decision-making	4.00	Agree
44	POLICY AND STRATEGY	Application of modern construction management and techniques	3.98	Agree
45	PARTNERSHIP AND RESOURCES	Slow payment processing	3.98	Agree
46	POLICY AND STRATEGY	Satisfying customer's expectations	3.96	Agree
47	PARTNERSHIP AND RESOURCES	Assurance with client's funding	3.96	Agree
48	POLICY AND STRATEGY	Difficulties in the application of quality system	3.89	Agree
49	POLICY AND STRATEGY	Inconsistencies and frequent changes in government policies, codes, and regulations	3.89	Agree
50	PARTNERSHIP AND RESOURCES	Insufficient investment in advanced technology	3.81	Agree
51	PEOPLE	Existence of a feedback system	3.79	Agree
52	LEADERSHIP	Non-existence of incentives and rewards	3.53	Agree

Table 1 ranked quality factors impacting government building construction in the NCR into five categories: Process, People, Leadership, Partnership and Resources, and Policy and Strategy, with all factors yielding significant weighted mean (WM) scores between 3.53 and 4.57. Process-related factors dominated, specifically the level of coordination between project team members (WM = 4.57), which is fundamental for planning (Wawak et al., 2020; Gurmu & Mahmood, 2024), followed by inadequate site inspection (WM = 4.55) and weak quality control (WM = 4.53) as primary defect contributors (Sin et al., 2024; Qi et al., 2021). People-related factors like teamwork (WM = 4.53) and lack of training (WM = 4.38 to 4.26) further emphasize that workforce competence is vital for quality outcomes (Aenet & Maniha, 2023; Mat Salleh et al., 2022). Leadership commitment (WM = 4.38) and proactive change management (WM = 4.36) provided structural alignment (Gurmu & Mahmood, 2024; Desta et al., 2023), while resource issues like skilled labor scarcity (WM = 4.45) and poor material availability (WM = 4.34) linked directly to failures (Khadim et al., 2023; Sin et al., 2024).

Finally, policy and strategy findings highlighted poor planning (WM = 4.47) and regulatory challenges (WM = 3.89) as key implementation hurdles (Aenet & Maniha, 2023; Govindaraj et al., 2022), suggesting that prioritizing site coordination, inspection, and training offers the greatest impact on project sustainability (Wawak, Ljevo, & Vukomanović, 2020; David et al., 2021).

Perceived factors affecting the quality of Government Building projects during Construction Phase based on demographics.

Table 2
Leadership as perceived factor to affect quality of government building projects based on Age

Age Bracket	N	Mean	Standard Deviation	Interpretation
25-35 years old	29	4.1897	.52	Agree
36-45 years old	5	3.6000	.72	Agree
46-55 years old	7	4.0000	.52	Agree
56-65 years old	4	4.3750	.35	Strongly Agree
TOTAL	**45**	**4.1333**	**.55**	**AGREE**

Table 2 presented respondents' perceptions of leadership-related factors across different age groups. Based on the results, respondents aged 56–65 years perceived leadership the highest, followed by those in the 46–55 years (WM = 4.375) and 25–35 years (WM = 4.1897) brackets. Respondents aged 36–46 years (WM = 3.6000) perceived it the lowest but still agreed on the significance of its effect on the quality of government building projects. Overall, the combined mean of 4.1333 (SD = 0.55) indicated general agreement among all respondents, suggesting that the factor was considered important in affecting project quality, with stronger recognition among the oldest and youngest respondents.

Table 3
People Related Factors as perceived factor to affect quality of government building projects as to Age

Age Bracket	N	Mean	Standard Deviation	Interpretation
25-35 years old	29	4.2012	.51	Agree
36-45 years old	5	3.7000	.84	Agree
46-55 years old	7	4.1071	.49	Agree
56-65 years old	4	4.2500	.44	Strongly Agree
TOTAL	**45**	**4.1352**	**.55**	**AGREE**

(WM = 4.1071) brackets. Similar to the findings for Leadership, respondents from the 36–45 years age group perceived this factor the lowest (WM = 3.7000). The combined mean of 4.1352 (SD = 0.55) indicated general agreement, showing that People-related factors were recognized as significant contributors to project quality, with the strongest perceptions observed among the oldest and youngest respondents.

Table 4
Policy and Strategy related Factors as perceived factors to affect quality of government building projects as to Age

Age Bracket	N	Mean	Standard Deviation	Interpretation
25-35 years old	29	4.0246	.61	Agree
36-45 years old	5	3.8571	.40	Agree
46-55 years old	7	3.9592	.69	Agree
56-65 years old	4	3.9643	.51	Agree
TOTAL	**45**	**3.992**	**.58**	**AGREE**

Table 4 presented respondents' perceptions of Policy and Strategy-related factors across different age groups. Based on the results, respondents aged 25–35 years (WM = 4.0246) perceived these factors the highest, followed by those in the 56–65 years and 46–55 years brackets. Respondents from the 36–45 years age group (WM = 3.8571) perceived this factor the lowest but still agreed on its significance. The combined mean of 3.992 (SD = 0.58) indicated general agreement, showing that Policy and Strategy-related factors were recognized as significant contributors to project quality, with stronger perceptions observed among the oldest and youngest respondents.

Table 5
Partnership and Resources related Factors as perceived factor to affect quality of government building projects according to Age

Age Bracket	N	Mean	Standard Deviation	Interpretation
25-35 years old	29	4.1379	.71	Agree
36-45 years old	5	3.7286	.54	Agree
46-55 years old	7	4.1122	.63	Agree
56-65 years old	4	3.5357	1.23	Agree
TOTAL	**45**	**4.0349**	**.73**	**AGREE**

Table 5 presented respondents' perceptions of Partnership-related factors affecting the quality of government building projects across age

groups. Based on the results, respondents aged 25–35 years (WM = 4.1379) perceived these factors the highest, followed by those in the 46–55 years and 36–45 years brackets. Respondents from the 56–65 years age group (WM = 3.5357) perceived this factor the lowest. The overall mean of 4.0349 (SD = 0.73) indicated general agreement among respondents, suggesting that partnerships were recognized as a contributing factor, though perceptions varied more within the oldest age group.

Table 6

Process related Factors as perceived factor to affect quality of government building projects as to Age

Age Bracket	N	Mean	Standard Deviation	Interpretation
25-35 years old	29	4.2989	.62	Strongly Agree
36-45 years old	5	4.0933	.72	Agree
46-55 years old	7	4.3333	.66	Strongly Agree
56-65 years old	4	4.0667	.51	Agree
TOTAL	**45**	**4.2619**	**.61**	**STRONGLY AGREE**

Table 6 presented respondents' perceptions of process-related factors across different age groups. Respondents aged 46–55 years (WM = 4.3333) and 25–35 years (WM = 4.2989) strongly agreed on the importance of these factors, while those in the 36–45 and 56–65 years brackets agreed. Overall, the combined mean of 4.2619 (SD = 0.61) indicated strong agreement, highlighting that process-related factors were considered critical contributors to the quality of government building projects.

Results from Tables 2 to 6 indicated that all age groups generally agreed that the five identified factors influenced construction quality. Process-related factors obtained the highest overall mean (WM = 4.2619, SD = 0.61), followed by People-related (WM = 4.1352, SD = 0.55) and Leadership factors (WM = 4.1333, SD = 0.55). While Partnership (WM = 4.0349, SD = 0.73) and Policy and Strategy (WM = 3.992, SD = 0.58) obtained lower scores, they remained influential, with the youngest respondents (25–35 years old) consistently perceiving high impacts across all quality factors.

Table 7

Leadership as perceived factor to affect quality of government building projects based on Role and Designation

Role/Designation	N	Mean	SD	Interpretation
Project Manager	11	4.1477	.68	Agree
Construction Manager	4	4.0000	.65	Agree
Project in Charge	7	4.1429	.67	Agree
Site/Field Engineer	15	4.2333	.52	Strongly Agree
QA/QC Materials Engineer	4	3.5937	.40	Agree
Office Engineer	4	4.1250	.45	Agree
TOTAL	**45**	**4.0349**	**.73**	**AGREE**

Table 7 presented respondents' perceptions of leadership as a factor affecting the quality of government building projects based on their role or designation. Based on the results, Site/Field Engineers (WM = 4.233) perceived leadership the most. Other roles, including Project Managers, Project-In-Charge, Office Engineers, and Construction Managers, also agreed on its significance. QA/QC Materials Engineers (WM = 3.5937) agreed as well, though they yielded the lowest mean score among the groups. Overall, the combined mean of 4.133 (SD = 0.58) reflected general agreement among all respondents, suggesting that leadership was widely perceived as a significant factor in ensuring project quality.

Table 8

People related factors as perceived factor to affect quality of government building projects based on Role and Designation

Role/Designation	N	Mean	SD	Interpretation
Project Manager	11	4.1477	.87	Agree
Construction Manager	4	4.0000	.34	Agree
Project in Charge	7	4.1429	.63	Agree
Site/Field Engineer	15	4.2333	.38	Strongly Agree
QA/QC Materials Engineer	4	3.5937	.27	Agree
Office Engineer	4	4.1250	.59	Agree
TOTAL	**45**	**4.0349**	**.58**	**AGREE**

Table 8 presented respondents' perceptions of people-related factors as influencing the quality of government building projects based on their role or designation.

Site/Field Engineers (WM = 4.2333) strongly agreed, followed by Project Managers, Project-In-Charge, Office Engineers, and Construction Managers. QA/QC Materials Engineers (WM = 3.5937) also agreed, though they yielded the lowest mean score among the groups. Overall, the combined mean of 4.1333 (SD = 0.58) demonstrated general agreement across all roles, highlighting the recognized importance of people-related factors in ensuring quality.

Table 9
Policy and Strategy related factors as perceived factor to affect quality of government building projects based on Role and Designation

Role/Designation	N	Mean	SD	Interpretation
Project Manager	11	4.0649	.32	Agree
Construction Manager	4	3.9643	.51	Agree
Project in Charge	7	3.9387	.64	Agree
Site/Field Engineer	15	4.0857	.60	Agree
QA/QC Materials Engineer	4	3.5000	.85	Agree
Office Engineer	4	4.0357	.57	Agree
TOTAL	**45**	**3.9905**	**.56**	**AGREE**

Table 9 presented respondents' perceptions of policy- and strategy-related factors affecting the quality of government building projects based on their role or designation. Site/Field Engineers, Project Managers, Project-In-Charge, Office Engineers, and Construction Managers agreed on the significance of these factors. QA/QC Materials Engineers (WM = 3.5000) also agreed, though they recorded the lowest mean score among the groups. The overall mean of 3.99 (SD = 0.56) indicated general agreement among all respondents regarding the impact of policy and strategy on project quality.

Table 10
Partnership related factors as perceived factor to affect quality of government building projects based on Role and Designation

Role/Designation	N	Mean	SD	Interpretation
Project Manager	11	3.9026	.70	Agree
Construction Manager	4	3.9107	.71	Agree
Project in Charge	7	4.1735	.92	Agree
Site/Field Engineer	15	4.1524	.80	Agree
QA/QC Materials Engineer	4	3.7678	.94	Agree
Office Engineer	4	4.1071	.59	Agree
TOTAL	**45**	**4.0349**	**.76**	**AGREE**

Table 10 presented respondents' perceptions of partnership-related factors as influencing the quality of government building projects based on their role or designation. Respondents across all roles—including Site/Field Engineers, Project Managers, Project-In-Charge, Office Engineers, and Construction Managers—agreed on the importance of these factors. QA/QC Materials Engineers (WM = 3.7678) also agreed, though they recorded the lowest mean score among the groups. The overall mean of 4.03 (SD = 0.76) indicated general agreement among all respondents.

Table 11
Process related factors as perceived factor to affect quality of government building projects based on Role and Designation

Role/Designation	N	Mean	SD	Interpretation
Project Manager	11	4.2667	.51	Strongly Agree
Construction Manager	4	3.8500	.75	Agree
Project in Charge	7	4.7143	.52	Strongly Agree
Site/Field Engineer	15	4.2800	.28	Strongly Agree
QA/QC Materials Engineer	4	3.8333	1.04	Agree
Office Engineer	4	4.2167	.61	Strongly Agree
TOTAL	**45**	**4.2607**	**.57**	**STRONGLY AGREE**

Table 11 presented respondents' perceptions of process-related factors based on their role, with Project Managers, Project-In-Charge, Site/Field Engineers, and Office Engineers strongly agreeing on their importance, while Construction Managers and QA/QC Materials Engineers agreed.

Overall, the combined mean of 4.26 (SD = 0.57) indicated strong agreement across all designations. Results from Tables 10 to 14 revealed that respondents generally agreed all five factors significantly affected project quality, with process-related factors ranking the highest (WM = 4.2607, SD = 0.57). Site/Field Engineers recorded consistently high perceptions across Leadership, People, and Process factors, whereas QA/QC Materials Engineers consistently recorded the lowest scores. While People-related and Leadership factors were rated highly, Policy and Strategy and Partnership and Resources remained significant despite receiving lower relative perceptions.

The following tables show the results of the respondents' perceptions of the factors affecting the quality of government building projects in the NCR during the construction phase. It includes the computed weighted mean and average weighted mean of the factors related to Leadership, People, Policy and Strategy, Partnership and Resources, and Process in terms of perceptions according to years of experience (Cuemath, n.d.; Aenet & Maniha, 2023; Wawak, Ljevo, & Vukomanović, 2020).

Table 12
Leadership related factors as perceived factor to affect quality of government building projects based on years of experience

Length of Experience	N	Mean	SD	Interpretation
5-10 years	32	4.1836	.50	Agree
11-15 years	8	3.8281	.65	Agree
16-20 years	3	3.7500	.70	Agree
21 years - above	2	4.6250	.00	Strongly Agree
TOTAL	**45**	**4.111**	**.55**	**AGREE**

Table 12 presented respondents' perceptions of leadership as a factor affecting the quality of government building projects based on their years of experience. Respondents with more than 21 years of experience (WM = 4.6250) strongly agreed on the significance of this factor. Those with 5–10 years and 11–15 years of experience agreed, while respondents with 16–20 years of experience (WM = 3.75) recorded the lowest perception but still agreed that the factor was significant. The overall mean of 4.11 (SD = 0.55) indicated general agreement among all respondents, suggesting that leadership was widely recognized as a significant factor in ensuring project quality.

Table 13
People related factors as perceived factor to affect quality of government building projects based on years of experience

Length of Experience	N	Mean	SD	Interpretation
5-10 years	32	4.288	.49	Strongly Agree
11-15 years	8	3.9844	.55	Agree
16-20 years	3	3.5417	.92	Agree
21 years - above	2	4.4375	.62	Strongly Agree
TOTAL	**45**	**4.1909**	**.56**	**AGREE**

Table 13 presented respondents' perceptions of People-related factors based on their length of experience. Respondents with 21 years or more (WM = 4.4375) and 5–10 years of experience (WM = 4.2880) strongly agreed on the importance of these factors, while those with 11–15 years agreed. Those with 16–20 years of experience (WM = 3.5417) recorded the lowest perception but still agreed that these factors significantly affected project quality during the construction phase. The total weighted mean of 4.19 (SD = 0.56) indicated general agreement, suggesting that People-related factors were widely recognized as critical, with stronger recognition among the least and most experienced respondents.

Table 14
Policy and Strategy related factors as perceived factor to affect quality of government building projects based on years of experience

Length of Experience	N	Mean	SD	Interpretation
5-10 years	32	4.0446	.59	Agree
11-15 years	8	3.8393	.66	Agree
16-20 years	3	3.9524	.65	Agree
21 years - above	2	3.7857	.10	Agree
TOTAL	**45**	**3.9916**	**.59**	**AGREE**

Table 14 presented respondents' perceptions of policy- and strategy-related factors affecting the quality of government building projects based on their length of experience. All groups—including those with 5–10 years, 11–15 years, 16–20 years, and 21 years and above—agreed on the significance of policy and strategy in influencing project quality. The total weighted mean of 3.99 (SD = 0.59) indicated general agreement, confirming that policy- and strategy-related factors were widely recognized as important contributors to project outcomes.

Table 15
Partnership related factors as perceived factor to affect quality of government building projects based on years of experience

Length of Experience	N	Mean	SD	Interpretation
5-10 years	32	4.1607	.63	Agree
11-15 years	8	3.9107	.77	Agree
16-20 years	3	3.8809	1.02	Agree
21 years - above	2	2.7500	1.06	Neutral
TOTAL	**45**	**4.0349**	**.73**	**AGREE**

Table 15 presented respondents' perceptions of partnership-related factors based on their length of experience. While groups with 5–10 years, 11–15 years, and 16–20 years of experience agreed on the significance of these factors in influencing project quality, those with 21 years and above remained neutral. The total weighted mean of 4.03 (SD = 0.73) indicated general agreement among all respondents. Overall, partnership was recognized as an important factor for project quality, though its perceived significance appeared lower among the most experienced respondents.

Table 16 presented respondents' perceptions of process-related factors based on their length of experience. Respondents with 5–10 years, 11–15 years, and 21 years or more of experience strongly agreed on the importance of these factors, while those with 16–20 years agreed. The total weighted mean of 4.26 (SD = 0.62) indicated strong agreement across all respondents, confirming that process-related factors were recognized as critical contributors to project quality, particularly among those with extensive field and managerial experience.

Table 16
Process related factors as perceived factor to affect quality of government building projects based on years of experience

Length of Experience	N	Mean	SD	Interpretation
5-10 years	32	4.2792	.62	Strongly Agree
11-15 years	8	4.4083	.66	Strongly Agree
16-20 years	3	3.6222	.60	Agree
21 years - above	2	4.3333	.28	Strongly Agree
TOTAL	**45**	**4.2619**	**.62**	**STRONGLY AGREE**

The results from Tables 12 to 16 indicated that process-related factors obtained the highest mean score (WM = 4.2619, SD = 0.62), followed by People-related (WM = 4.1909, SD = 0.56) and Leadership factors (WM = 4.1111, SD = 0.55). Respondents with 21 years or more of experience expressed the strongest agreement regarding Leadership and Process-related factors, reflecting a high valuation of managerial competence and established procedures among veteran practitioners, while Partnership-related factors exhibited greater variability within this specific group.

Table 17
Overall mean scores of factors affecting the quality of government building projects based on demographic groups

Factors	Overall Mean	Interpretation
Leadership	4.126	Agree
People	4.153	Agree
Policy and Strategy	3.991	Agree
Partnership	4.035	Agree
Process	4.261	Strongly Agree

Table 17 summarized the overall mean scores of the five factors across all demographic groups. Based on the results, Process-related factors ranked highest (WM = 4.261, Strongly Agree), followed by People-related factors (WM = 4.153) and Leadership (WM = 4.126). Partnership (WM = 4.035) and Policy and Strategy (WM = 3.991) were

likewise recognized as significant, though they were perceived as relatively less influential (Aenet & Maniha, 2023; Wawak, Ljevo, & Vukomanović, 2020; Desta et al., 2023).

Overall, the results indicated that all factors—Leadership, People, Policy and Strategy, Partnership and Resources, and Process—were perceived to significantly affect the quality of government building projects in the NCR during the construction phase. Respondents consistently identified these factors as critical determinants of construction quality, regardless of their age, role, or years of experience (Gurmu & Mahmood, 2024; David et al., 2021).

Differences in the perception of respondents on the factors affecting project quality during the construction phase of Government Building Projects when grouped according to Role/Designation and Years of Experience. The following table shows the analysis of variance for the perceptions of the respondents on the factors affecting the quality of government building projects in terms of demographics Age, Role/Designation, and Years of Experience. The performed analysis aimed to compare the between-groups and within-groups variability (Gravetter & Wallnau, 2021; Chatzi & Doody, 2023).

Table 18

Analysis of Variance of the Respondents' Perception on the Factors Affecting Quality of Government Building Projects in NCR during Construction Phase in terms of Age

Factors	Source of Variation	SS	df	MS	F	p-value	Interpretation
Leadership	Between Groups	1.85	3	0.62	2.18	0.11	Not Significant
	Within Groups	11.60	41	0.28			
People	Between Groups	1.17	3	0.39	1.32	0.28	Not Significant
	Within Groups	12.20	41	0.30			
Policy and Strategy	Between Groups	0.12	3	0.04	0.12	0.95	Not Significant
	Within Groups	15.10	41	0.37			
Partnership & Resolution	Between Groups	1.82	3	0.61	1.13	0.35	Not Significant
	Within Groups	21.90	41	0.54			
Process	Between Groups	0.37	3	0.12	0.31	0.82	Not Significant
	Within Groups	16.60	41	0.40			

Table 18 presented the results of the one-way ANOVA. Across all five categories—Leadership ($F = 2.18$, $p = 0.11$), People ($F = 1.32$, $p = 0.28$), Policy and Strategy ($F = 0.12$, $p = 0.95$), Partnership and Resources ($F = 1.13$, $p = 0.35$), and Process ($F = 0.31$, $p = 0.82$)—the computed p-values consistently exceeded the 0.05 threshold, with between-group sums of squares remaining lower than within-group sums. These results indicated that there were no statistically significant differences in perceptions across different age brackets, meaning all respondents shared a unified view of these quality factors regardless of age (Gravetter & Wallnau, 2021; Wawak, Ljevo, & Vukomanović, 2020; Aenet & Maniha, 2023; Gurmu & Mahmood, 2024; Desta et al., 2023). Ultimately, the low F-values confirmed that age did not significantly influence how respondents perceived the determinants of construction quality in the NCR (Chatzi & Doody, 2023; Ntumi, 2021).

Table 19

Analysis of Variance of the Respondents' Perception on the Factors Affecting Quality of Government Building Projects in NCR during Construction Phase in NCR in terms of Role/Designation

Factors	Source of Variation	SS	df	MS	F	p-value	Interpretation
Leadership	Between Groups	1.367	5	0.273	0.883	.502	Not Significant
	Within Groups	12.078	39	0.31			
People	Between Groups	1.136	5	0.227	0.727	.608	Not Significant
	Within Groups	12.195	39	0.313			
Policy and Strategy	Between Groups	1.189	5	0.238	0.662	.654	Not Significant
	Within Groups	14.011	39	0.359			
Partnership & Resolution	Between Groups	0.902	5	0.18	0.308	.905	Not Significant
	Within Groups	22.849	39	0.586			
Process	Between Groups	2.859	5	0.572	1.585	.187	Not Significant
	Within Groups	14.073	39	0.361			

Table 19 presented the one-way ANOVA results. Across all categories—Leadership ($F = 0.883$, $p = 0.502$), People ($F = 0.727$, $p = 0.608$), Policy and Strategy ($F = 0.662$, $p = 0.654$), Partnership and Resources ($F = 0.308$, $p = 0.905$), and Process ($F = 1.585$, $p = 0.187$)—the computed p-values consistently exceeded the 0.05 threshold, with between-group sums of squares remaining lower than within-group sums. These results indicated that no statistically significant differences existed, meaning respondents shared a unified perception of these quality factors regardless of their specific role in the

project (Gravetter & Wallnau, 2021; Wawak et al., 2020; Gurmu & Mahmood, 2024;
; Desta et al., 2023; Osegbo et al., 2021; Sin et al., 2024). Ultimately, the non-significant p-values confirmed that professional designation did not influence how individuals perceived the determinants of construction quality in the NCR (Chatzi & Doody, 2023; Ntumi, 2021).

Table 20

Analysis of Variance of the Respondents' Perception on the Factors Affecting Quality of Government Building Projects in NCR during Construction Phase in terms of Years of Experience

Factors	Source of Variation	SS	df	MS	F	p-value	Interpretation
Leadership	Between Groups	1.728	5	0.576	2.016	0.127	Not Significant
	Within Groups	11.716	39	0.286			
People	Between Groups	1.643	5	0.548	1.921	0.141	Not Significant
	Within Groups	11.688	39	0.285			
Policy and Strategy	Between Groups	0.365	5	0.122	0.336	0.799	Not Significant
	Within Groups	14.835	39	0.362			
Partnership & Resolution	Between Groups	4.003	5	1.334	2.77	0.054	Not Significant (Near)
	Within Groups	0.482	39	0.482			
Process	Between Groups	1.419	5	0.473	1.25	0.304	Not Significant
	Within Groups	15.513	39	0.378			

Table 20 presented the one-way ANOVA results. Statistical analysis for Leadership (F = 2.016, p = 0.127), People (F = 1.921, p = 0.141), Partnership and Resources (F = 0.308, p = 0.905), and Process (F = 1.25, p = 0.304) yielded p-values exceeding the 0.05 threshold, indicating no significant differences in perception. While the Policy and Strategy category (F = 2.77, p = 0.054) approached significance, it ultimately remained above the alpha level, suggesting that all respondents shared similar views regardless of their professional tenure (Aenet & Maniha, 2023; Desta et al., 2023; Gravetter & Wallnau, 2021; Gurmu & Mahmood, 2024; Osegbo et al., 2021; Sin et al., 2024; Wawak et al., 2020). Overall, the low F-values and non-significant p-values confirmed that years of experience did not significantly influence how respondents perceived the factors affecting government building project quality in the NCR (Chatzi & Doody, 2023; Ntumi, 2021).

Proposed Priority Implementation Plans for Government Building Projects in NCR during Construction Phase

Table 21

Proposed Priority Actions Based on the Perceptions of the Respondents on the Factors that affect Quality of Government Building Projects in the National Capital Region during Construction Phase

Quality Factor	WM	Interpretation	Priority Actions to be Taken
Level of coordination between project team members	4.57	Strongly Agree	Implementation of weekly coordination meetings
Inadequate site inspection of materials and equipment	4.55	Strongly Agree	Develop and implement strict inspection checklist and perform random quality audits
Teamwork extent of parties involved in the construction	4.53	Strongly Agree	Organize team-alignment meetings
Poor quality control and assurance procedures	4.53	Strongly Agree	Strictly monitor and enforce Quality Management Plans and Standard Operating Procedures
Quality of drawings and specifications received from the designer	4.49	Strongly Agree	Observe thorough review of plans prior to site implementation
Poor on-site supervision	4.49	Strongly Agree	Assign well-experienced technical personnel and maintain updated real-time daily monitoring of construction activities.
Poor planning and scheduling during the construction phase	4.47	Strongly Agree	Update project schedule, track milestones and weekly schedule reviews for monitoring
Scarcity of skilled labor	4.45	Strongly Agree	Prioritize hiring of skilled workers and organize short-term skills development program for existing workers
Extent of management leadership in promoting quality	4.38	Strongly Agree	Management to conduct regular site walk through followed by Quality-related meetings.
Lack of training and development among the project team members	4.38	Strongly Agree	Organize skills upgrading trainings and learning sessions
Planning and detailing different stages of change in the project	4.36	Strongly Agree	Revision of management plan if needed with impact assessment before implementation
Quality of comprehensive documentation	4.34	Strongly Agree	Establish standardized documentation format and conduct regular document audits
Low quality and poor availability of materials	4.34	Strongly Agree	Perform pre-qualification of suppliers, adhere to existing material quality specifications and standards
Design changes	4.32	Strongly Agree	Implement and document formal design change request and secure approval prior to implementation
Conformance to specifications, codes, and standards	4.32	Strongly Agree	Conduct compliance inspections and third-party quality verification
Labor productivity and competency	4.3	Strongly Agree	Perform continuous skills development trainings and performance monitoring schemes
Existence of conflicts between project partners	4.3	Strongly Agree	Conduct regular coordination meetings and conflict resolution process

Level of management commitment to promote continuous quality improvement	4.3	Strongly Agree	Set quality performance targets and review them in management meetings
Assigned technical personnel on-site lacks experience	4.28	Strongly Agree	Organize mentoring programs to senior technical personnel / Assign senior supervisors on site
Unawareness of proper planning tools and techniques by the Project Manager	4.28	Strongly Agree	Launch training on modern planning tools for Project Managers including team members
Measurement and review of effectiveness of quality management plan	4.26	Strongly Agree	Conduct periodic internal audits and management reviews of the QMP
Shortage of available technical personnel	4.26	Strongly Agree	Perform job fairs to recruit additional qualified staff; Launch skills and development training for existing personnel
Existence of systematic procedures to plan, evaluate, and control project goal achievement	4.21	Strongly Agree	Develop standard monitoring and control procedures with Key Performance Indicators
Poor quantification of materials/equipment needed	4.21	Strongly Agree	Improve material quantification by using quantity take off software
Insufficient attention to safety and disaster prevention	4.21	Strongly Agree	Conduct safety audits, regular drills, implement risk assessments and strictly enforce the approved CSHP of the projects

Table 21 identified 25 out of 52 factors that received "Strongly Agree" perceptions, with mean values ranging from 4.21 to 4.57, supporting previous research that emphasized management, coordination, and technical control as critical quality determinants (Aenet & Maniha, 2023; Wawak et al., 2020; Alfalah et al., 2023). Based on these findings, an implementation plan was developed to transform the results into a practical quality improvement framework for government building projects in the NCR (Aenet & Maniha, 2023; Wawak et al., 2020).

This plan targeted high-priority factors and integrated several key components: proposed preventive and corrective actions, specific tasks, and priority levels based on urgency (Desta et al., 2023; Alfalah et al., 2023). It further established accountability through designated responsible persons, identified essential resources, and evaluated cost implications ranging from minimal to manageable (Wawak et al., 2020). Additionally, the framework defined implementation timeframes, success indicators, and a performance matrix to provide measurable metrics for evaluating the effectiveness of each action (Desta et al., 2023; Alfalah et al., 2023). Detailed plans were provided in Appendix 3.

DISCUSSION

The study examined 45 randomly selected contractor personnel involved in ongoing government building projects in the National Capital Region (NCR). Most respondents were Site/Field Engineers (33.33%), aged 25–35 (64.44%), with 5–10 years of experience (71.11%). Analysis of the 52 quality factors revealed that all were perceived as significant, with weighted means ranging from 3.53 to 4.57 (Aenet & Maniha, 2023; Desta et al., 2023; Wawak et al., 2020). Process-related factors, specifically coordination levels and inspection procedures, ranked highest, followed by People, Leadership, Partnership and Resources, and Policy and Strategy (Alfalah et al., 2023; Sin et al., 2024). While Site Engineers provided the highest ratings and QA/QC Engineers the lowest, all demographic groups consistently identified these factors as critical determinants of construction quality (Mat Salleh et al., 2022; Alabdulmunem, 2020; Dorcas et al., 2019).

One-way ANOVA tests were conducted to determine if perceptions varied significantly across demographic groups (Chatzi & Doody, 2023; Ntumi, 2021). Results showed no statistically significant differences based on age or role, as all p-values exceeded 0.05. Similarly, years of experience did not yield significant differences, although the Partnership and Resources factor approached significance ($p = 0.054$). Consequently, the study accepted the Null Hypothesis (H_0), concluding that contractor personnel shared a unified perception of quality-affecting factors regardless of their demographic background (Gravetter & Wallnau, 2021; Wawak et al., 2020). This underscores the universal recognition of managerial commitment, skilled labor availability, and robust operational procedures as essential for maintaining infrastructure resilience and public trust (Aenet & Maniha, 2023; Alfalah et al., 2023).

Based on these conclusions, the study recommended that contractors enhance process efficiency, implement leadership mentorship programs, and address skilled

labor shortages through certified training. It was further suggested that organizations promote a unified quality culture that allows for role-specific applications of quality assurance policies. For future research, the study proposed expanding the geographic scope and including personnel from consulting and government agencies. Specific attention should be given to the Partnership and Resources factor through qualitative verification, and separate studies should be conducted for QA/QC Engineers to explore technical compliance perspectives. Finally, professional validation of the proposed implementation plan was recommended to ensure its effectiveness in improving government project delivery in the NCR.

Author contributions. (Not applicable)

Conflict of interest. The author declares no conflict of interest.

Funding source. This research received no external funding.

Artificial intelligence use. AI-assisted language editing was performed using Copilot to enhance and improve the grammar and structure; final revisions and accountability rest upon the author.

Ethics approval statement. Ethical approval was obtained from the Polytechnic University of the Philippines Research Ethics Office.

Data availability statement. All data supporting the findings of this study are included within the manuscript and its supplementary materials.

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