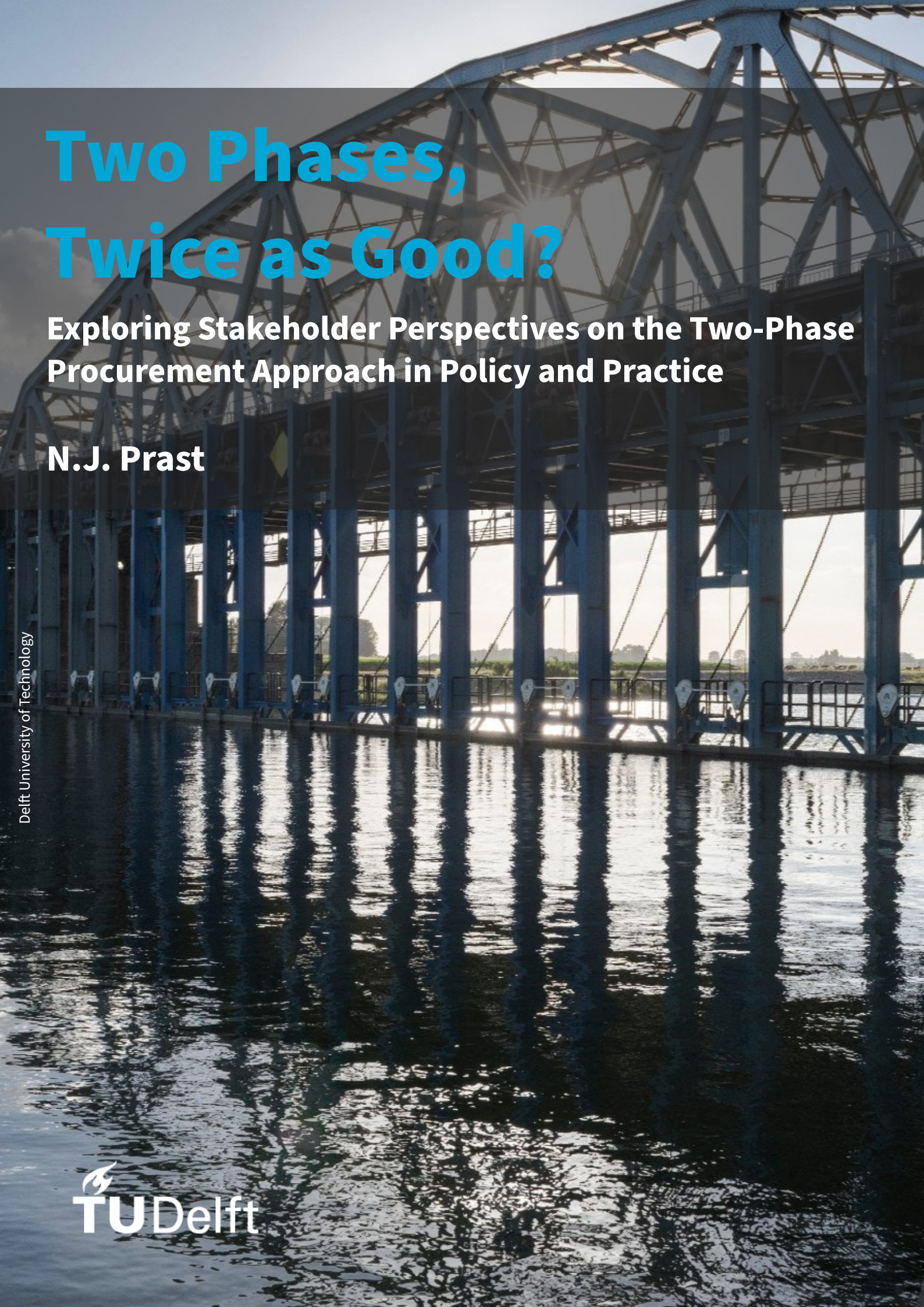

Two Phases, Twice as Good?

Exploring Stakeholder Perspectives on the Two-Phase Procurement Approach in Policy and Practice

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by

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Preface

In front of you lies my master's thesis, which explores the two-phase procurement approach in Dutch infrastructure projects. What initially started as a broad interest in public procurement gradually developed into a more specific fascination with the infrastructure sector. Throughout this research, my interest in how projects are organised, contracted and governed has only deepened. The sector has revealed itself as one in which there is still much to discover, reflect upon and improve. In that sense, this thesis is not only an academic exercise, but also a personal starting point. In the spirit of *practice what you preach*, this work reflects an ambition to contribute, now and in the future, to making the sector even more successful.

This thesis marks the completion of the Master's degree in Complex Systems Engineering and Management at TU Delft, and with it, the end of my time as a student. Studying in Delft has been an amazing experience. TU Delft has proven to be an inspiring place to learn, question and grow, both academically and personally. Gratitude is due for the opportunities that were offered, the freedom to explore personal interests, and the many people who shaped this period. The years in Delft have laid a strong foundation for what lies ahead.

Sincere gratitude goes to Rebelgroup for providing such a supportive and stimulating environment in which to conduct this research. A special thanks goes to Renée Jaarsma, whose guidance has been invaluable throughout the process. Her thorough feedback, critical questions and role as a sparring partner significantly strengthened this thesis. Equally appreciated is the way in which Renée and the team facilitated access to the right interview participants.

Gratitude is also extended to all interview participants for their openness, time and enthusiasm. Every conversation was different, insightful and engaging, and each contributed in a unique way to the research. The willingness to share experiences, doubts and reflections formed the backbone of this study. The enthusiasm encountered during these discussions was truly contagious and made the research both meaningful and enjoyable.

Much appreciation is owed to the academic supervisors. Wijnand Veeneman and Jan Anne Annema proved to be an excellent duo in sharpening ideas, discussing the topic and helping to position the findings more clearly. Their feedback was consistently constructive and actionable, and it has had a substantial impact on the quality and direction of this thesis.

Finally, gratitude goes to family, friends and roommates for their constant support, encouragement and perspective. You reminded me that there was no need to reinvent the wheel, as much of what was needed was already close by if only I took the time to see it. Your patience, trust and encouragement meant more than words can express.

Looking back, this period was marked by great satisfaction and gratitude. It has been an intense and inspiring journey, and I am excited to see what the future holds.

Noud Prast
February 10, 2026

Summary

Over the past decades, Dutch infrastructure projects have been delivered through a variety of procurement and delivery models aimed at addressing challenges related to uncertainty, complexity, and fragmentation. While traditional and later integrated contract forms each offered specific advantages, they also produced persistent drawbacks, including high failure costs, increasingly adversarial client–contractor relationships, and a declining willingness of market parties to participate in projects. In response, public clients have increasingly searched for alternative approaches to organising project delivery.

Within this context, the two-phase procurement approach has been introduced as a response intended to use contractor expertise to reduce project risks, thereby increasing predictability for both public clients and contractors and lowering transaction costs. However, despite its growing application, the approach is not evaluated uniformly in practice. Stakeholders differ in how they interpret its key elements and assess its consequences, indicating that there is no shared understanding of whether and under what conditions the two-phase procurement approach constitutes an improvement over existing procurement models.

The research objective of this study is to analyse how stakeholders in Dutch infrastructure projects perceive and evaluate the two-phase procurement approach in relation to its intended objectives. The study focuses on how stakeholders prioritise these objectives and assess the trade-offs in practice. The main research question guiding this study is: *How do stakeholders in Dutch infrastructure projects perceive and evaluate the two-phase procurement approach in relation to its intended objectives?*

The two-phase procurement approach is positioned as a form of Early Contractor Involvement (ECI). In contrast to traditional models, based on detailed designs and relatively fixed prices, the two-phase procurement approach involves selecting a contractor at an earlier stage, primarily on qualitative criteria and with limited price components. During Phase 1, the public client and contractor jointly further develop the design and elaborate cost estimates. A Go/No-Go decision then determines whether the project proceeds to Phase 2, in which execution takes place under agreed conditions and a final price.

The emergence of the approach is analysed against a broader background of persistent fragmentation in the construction sector. Traditional models separated design and execution, limiting knowledge exchange, contributing to high failure costs and adversarial relationships. Later integrated contract forms attempted to overcome this by combining phases within one contract, but often required contractors to price major uncertainties at an early stage. This encouraged speculative bidding, increased transaction and failure costs, reinforced adversarial behaviour, and reduced willingness to participate in new projects. The two-phase approach is presented as a possible alternative intended to involve execution knowledge earlier, manage risk and price development more carefully, improve predictability, reduce transaction costs, and support more collaborative ways of working, while also creating opportunities for learning and innovation.

This study applied Q-methodology to capture stakeholder perspectives. Q-methodology identifies shared viewpoints through the ranking of statements and the subsequent factor analysis. The study is structured around eight themes derived from the ECI literature: Capability, Collaboration, Culture, Innovation, Pricing, Risk Allocation, Transaction Costs, and Value for Money, which guided both the formulation of the statements and the analysis of the results.

The analysis identifies three distinct perspectives on the two-phase procurement approach. Across these perspectives, there is broad consensus on several effects. Stakeholders agree that the approach primarily shifts key discussions on feasibility, risk, design choices and cost consequences to Phase 1, rather than allowing them to emerge during execution. This earlier timing is associated with reduced fragmentation between design and execution, improved buildability, fewer surprises during construction, and greater stability during Phase 2. Costs are perceived to increase during Phase 1 while remaining more stable during Phase 2, and transaction costs are not reduced overall but redistributed: contractors face lower unpaid tendering effort, while public clients incur higher preparatory effort and costs. Finally, while the Go/No-Go decision is recognised as an important structuring milestone, it is not widely perceived as a strong corrective mechanism in price formation, as sunk costs, time pressure and the need to restart procurement make a No-Go decision difficult in practice.

The perspectives diverge, however, in how these consequences are evaluated. The first perspective places transparency at the centre and views it as the key mechanism linking collaboration, culture, pricing and risk allocation. Open-book pricing and shared insight into cost development are seen as essential for trust, reciprocity and shared responsibility, with higher Phase 1 costs interpreted as acceptable investments when they prevent disruptions, disputes and rework in Phase 2. From this viewpoint, the approach is valued primarily for improving relational working and project culture, while also delivering execution predictability, although transparency is considered effective only when it is reciprocal and well organised.

The second perspective is more conditional and places public client capability at the centre. Early collaboration and transparency are seen as beneficial only when clients have sufficient technical, financial and organisational capacity to assess designs, cost estimates and risk allowances and to actively steer decisions. When this capability is limited, transparency may increase dependence on the contractor rather than strengthening control, and risk reduction tends to dominate, resulting in conservative design choices, higher upfront costs and scepticism about gains in value for money and innovation.

The third perspective values early involvement of execution expertise mainly for its contribution to execution stability and knowledge continuity. Early construction input is seen as reducing design changes and surprises during construction, but this perspective also highlights vulnerabilities related to pricing, incentives, bargaining power and transaction costs. Paying for effort in Phase 1 and the limited practical strength of the Go/No-Go decision are perceived as weakening client leverage and contributing to upward cost pressure, framing execution stability as a trade-off that requires strong client expertise to maintain control over early decisions.

When the findings are related back to the intended objectives of the two-phase procurement approach, the study shows that the approach most consistently delivers on earlier integration of execution expertise and earlier identification of risks and uncertainties. By bringing feasibility, design and cost discussions forward in time, the approach reduces fragmentation between design and execution and contributes to improved buildability and more predictable execution.

At the same time, this predictability is achieved through a demanding set of trade-offs. Risk reduction and execution stability tend to be prioritised over innovation, leading to conservative design choices and higher upfront costs, effectively creating risk premiums for the public client. Improved collaboration and a more positive working culture are observed, but only under specific conditions, particularly when transparency is reciprocal and public clients possess sufficient capability to critically assess and steer early decisions. Transaction costs are not eliminated but redistributed, increasing demands on public clients while reducing tendering effort for contractors. Overall, the two-phase procurement approach emerges as a meaningful but demanding step towards more collaborative and predictable project delivery. Its effectiveness depends less on the model itself than on the willingness and capacity of both public clients and contractors to take responsibility for its outcomes.

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Nomenclature

Abbreviations

2S-ECI	Two-Stage Early Contractor Involvement
AKWR-percentages	Algemene kosten winst en risico percentage
BPKV	Beste Prijs–Kwaliteit Verhouding
CFA	Centroid Factor Analysis
CoSEM	Complex Systems and Engineering
DBB	Design–Bid–Build
DBFM(O)	Design–Build–Finance–Maintain(–Operate)
DBM(O)	Design–Build–Maintain(–Operate)
D&C	Design & Construct
E&C	Engineering & Construct
ECI	Early Contractor Involvement
EMVI	Economisch meest voordelige inschrijving
EV	Eigenvalue
HWBP	Hoogwaterbeschermingsprogramma
PCA	Principal Component Analysis
PDM	Project Delivery Model
Q-SV	Composite Q-sort
S.D.	Standard deviation
UAV-GC	Uniforme Administratieve Voorwaarden voor Geïntegreerde Contractvormen

Translations

Algemene kosten winst en risico percentage	General costs, profit and risk percentages
Beste Prijs–Kwaliteit Verhouding	Best Price–Quality Ratio
Concurrentiegerichte dialoog	Competitive dialogue
Economisch meest voordelige inschrijving	Most economically advantageous tender
Hoogwaterbeschermingsprogramma	Flood protection programme
Meervoudig onderhandse procedure	Restricted negotiated procedure
Tweefasenaanpak	Two-phase procurement approach
Wachtkamerovereenkomst	Waiting-room agreement

1

Introduction: The Search for Predictable Infrastructure Delivery

1.1. Growing Pressure on Infrastructure

Every day, people use roads, bridges, tunnels, and other infrastructure to travel to work, transport goods, and move through the Netherlands. Ensuring that this infrastructure remains safe, reliable, and available for everyday use is not self-evident. Public clients responsible for delivering and maintaining these assets are facing a growing volume of projects characterised by high levels of uncertainty and complexity.

A large part of the Dutch infrastructure was constructed during the rapid expansion of the 1950s and 1960s (Ministerie van Infrastructuur en Waterstaat, n.d.), and many assets are now approaching the end of their intended lifespan. The *Vervanging en Renovatie Prognoserapport* projects that thousands of assets will require replacement or major renovation between 2023 and 2050 (Ministerie van Infrastructuur en Waterstaat, 2022). These projects are often characterised by substantial uncertainty, as knowledge about the condition of ageing assets is limited. At the same time, delayed maintenance and renewal increase the risks of safety issues, unplanned outages, and escalating costs, reinforcing the urgency of infrastructure delivery (Rijkswaterstaat, 2020).

Project complexity is further increasing due to stricter environmental standards, higher traffic volumes, rapid technological developments in digitalisation and cybersecurity, the need for climate resilience, and ambitions related to standardisation and sustainability (Werkgroep 2-fasen aanpak, 2023; Knoope et al., 2022; National Coordinator for Security and Counterterrorism, 2024). These challenges are intensified by the inherently fragmented nature of infrastructure delivery. Responsibilities are divided across multiple actors and disciplines, and work is split across successive phases such as planning, design, procurement, construction, operation, and maintenance.

The combination of these factors makes it difficult for public clients to deliver projects in a predictable and controlled manner, with significant cost overruns, long project durations, and substantial disruption for users as recurring risks.

1.1.1. The Evolution of Infrastructure Procurement

In the context, where infrastructure projects are characterised by uncertainty, complexity, urgency, and fragmentation, the way projects are procured becomes a key factor in determining whether public funds are spent effectively and in shaping how projects develop in practice. The procurement strategy structures which actors are involved,

at what phase they are engaged, and on what basis decisions are made. Through strategic choices regarding delivery models, scope, and the allocation of risks and responsibilities, it sets the framework within which public clients and participating actors navigate trade-offs between cost, time, capacity, risk, collaboration, and environmental and societal considerations over the project lifecycle.

For much of the twentieth century, infrastructure projects were procured through traditional models characterised by a clear separation between design and execution. Public clients were responsible for developing the design, after which contractors were engaged primarily to execute the works. For relatively straightforward and well-defined projects, this separation did not pose major problems and provided clarity in roles and responsibilities. However, when applied to more complex infrastructure projects, it fragmented the project process. Design decisions were largely made without the direct involvement of those responsible for execution, limiting opportunities for early knowledge exchange. As a result, constructability issues and risks often surfaced only at later stages, contributing to cost overruns and delays (Riazi et al., 2020; Alashwal and Abdul-Rahman, 2011).

From the 1990s onwards, Dutch infrastructure procurement increasingly shifted towards more integrated models in response to the limitations of fragmented project delivery. By combining design and execution within a single contract, approaches such as Design & Construct (D&C) were based on the growing belief that contractors were not only capable of building, but also of taking responsibility for the design of complex infrastructure projects (Chao-Duivis, 2019). This shift was further reinforced by the "market, unless" principle, which encouraged public clients to transfer responsibilities to the market wherever possible. The underlying expectation was that this would promote life-cycle cost optimisation and ensure long-term budget predictability (Koppenjan et al., 2020).

Over time, integrated contracts also exposed structural weaknesses. A central point of criticism concerns risk allocation during the tender phase: contractors are required to account for uncertainties in their tender prices while competing for the contract, even though the definitive design is only completed after contract award. As a result, contractors must price risks that cannot yet be fully identified or realistically anticipated at the time of bidding (Chao-Duivis, 2019). In large and complex projects, the financial consequences of such unforeseen risks proved substantial, as reflected in persistently high failure costs in the Dutch construction industry, estimated at around 5 percent of annual turnover (Van Heel et al., 2019). This corresponds to approximately €5 billion per year, a level that exceeds typical profit margins in the sector.

Moreover, competitive tendering under integrated contracts encouraged behavioural responses focused on managing financial risks. The tender phase is associated with high transaction costs, as contractors must invest substantial time, expertise, and money in preparing offers, developing plans, and hiring specialist advice without any certainty of success (Chao-Duivis, 2019; Koppenjan et al., 2020). Under this competitive pressure, contractors were often pushed to submit low bids, sometimes underestimating time, costs, and risks, and later attempting to recover losses during execution through changes and claims (Chao-Duivis, 2019; Flyvbjerg and Bester, 2021; Flyvbjerg et al., 2009). This dynamic contributed to a "bid low, claim later" culture and fuelled adversarial relationships between clients and contractors (Bourn, 2007; Wolstenholme et al., 2009).

For contractors, increasing risk exposure combined with persistently low profit margins has reduced the attractiveness of participation in large and complex integrated infrastructure projects. In the United Kingdom, these pressures culminated in 2018 in the bankruptcy of a major contractor that at the time held an order book of approximately £7 billion, following financial losses on several large infrastructure projects (NOS, 2018). Similar signals have emerged in the Netherlands. In 2021, BAM, one of the country's largest construction companies, announced that it would no longer bid on projects with a contract value exceeding €150 million (Doodeman, 2021a; Doodeman, 2021b). More recently, the tender for the renovation of the Van Brienenoord Bridge was cancelled due to insufficient market interest (Ministerie van Infrastructuur en Waterstaat, 2024).

In response, public clients have increasingly explored alternative ways of organising procurement that allow contractors' expertise to be used earlier in the project to better manage risks and thereby improving predictability.

1.2. Introducing the Two-Phase Procurement Approach

Therefore, public clients in the Netherlands have introduced the two-phase procurement approach (*Tweefasenaanpak*)(Werkgroep 2-fasen aanpak, 2023; Hoogwaterbeschermingsprogramma (HWBP) and Van Dijk, 2025; Fijneman and CROW, 2020). The key distinction between traditional procurement and the two-phase procurement approach is illustrated in Figure 1. In traditional procurement, a contractor is selected on the basis of a best-value tender and commits to a fixed price during the tender phase. In contrast, the two-phase procurement approach involves the early selection of a contractor on the basis of qualitative criteria combined with a provisional price. During the first phase (Phase 1), the public client and contractor work collaboratively to further develop the design, explore uncertainties, and refine cost estimates as project knowledge increases. Only after this joint phase of design development and risk exploration, and following a Go/No-Go decision, are the final contractual terms and price agreed, after which Phase 2 proceeds with execution (Fijneman and CROW, 2020). If no agreement is reached, the public client retains the option to continue procurement through more traditional means using the design developed in Phase 1.

The two-phase procurement approach pursues two main objectives. First, it aims to make better use of contractors' expertise at an early stage in order to identify and manage project risks and opportunities more effectively. By doing so, it seeks to improve the reliability of cost estimates and enhance the predictability and manageability of complex infrastructure projects for both public clients and contractors. Second, the approach aims to reduce transaction costs associated with competitive tendering, thereby contributing to a more sustainable and efficient infrastructure sector (Werkgroep 2-fasen aanpak, 2023).

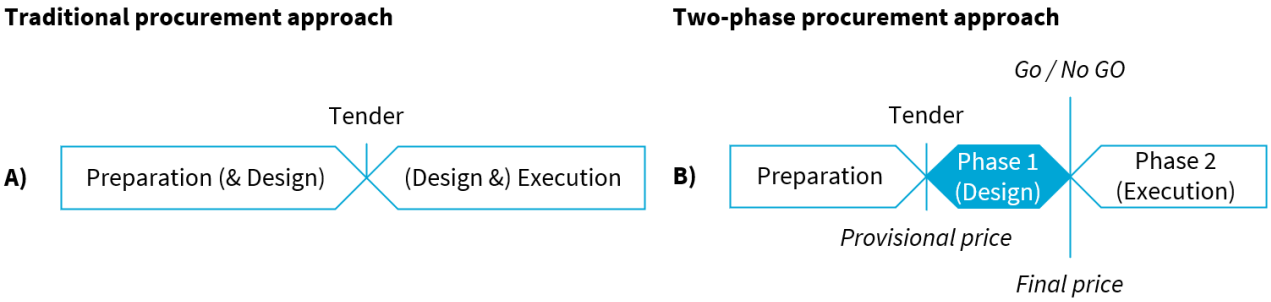

Figure 1: Schematic Illustration of A) Traditional Procurement Approach and B) Two-phase Procurement Approach

1.3. Diverging Perspectives on the Two-phase Procurement Approach

Although the two-phase procurement approach is presented as a coherent strategy, experiences in practice show that stakeholders evaluate its implications in different ways. Rather than being uniformly understood, the approach is valued and criticised depending on which aspects of project delivery stakeholders consider most important.

An example is the Go/No-Go decision. For some stakeholders, this moment is seen as a strength of the two-phase approach, as it provides clarity and certainty before committing to execution. Others, however, experience the Go/No-Go decision as a point of pressure, particularly given the intensive and costly nature of Phase 1, where delays have immediate financial consequences (Van Netten, 2024). Differences are also evident in how collaboration and expertise are experienced. Early contractor involvement is welcomed by some as an opportunity to make better use of technical knowledge and improve design choices. Others, however, raise concerns about the capacity of public clients to fulfil their role in Phase 1, noting that perceived imbalances in expertise or resources may shift control towards the contractor (Van Netten, 2024).

These diverging evaluations are also visible across organisations. Rijkswaterstaat presented it as a strategy to redistribute risks and restore trust between client and contractor, whereas contractors acknowledged benefits in terms of more transparent pricing but also pointed to higher transaction costs and risks of lock-in (Ysbrand Visser,

2020; Heemskerk et al., 2024). Within the Hoogwaterbeschermingsprogramma, water boards reported clear advantages in terms of innovation, collaboration, and earlier risk identification, but tensions emerged with the programme directorate over subsidy procedures and the assessment of market conformity (Significant Synergy, 2023).

1.4. Problem Definition

The two-phase procurement approach has been widely adopted in the Netherlands as a response to persistent challenges in infrastructure procurement. Its introduction was largely policy-driven and inspired by selected pilot projects and foreign experiences, even though the institutional and market conditions in the Netherlands differed from those contexts (Griffin and Moorhead, 2010; Cabinet Office UK, 2014; Rijkswaterstaat, 2020). While these pilots were considered promising and the objectives of the approach are clearly articulated in policy and guidance documents, this does not automatically translate into a shared understanding or consistent application in practice.

As shown in the preceding section, stakeholders evaluate key elements of the two-phase procurement approach in different ways. The same features of the approach can be experienced as strengths or sources of concern. These diverging evaluations indicate that the two-phase procurement approach does not operate as a uniform solution, but takes shape through how actors interpret and value its implications within specific project and organisational contexts.

Despite its widespread use, systematic insight into how stakeholders evaluate the two-phase procurement approach and how these evaluations relate to its functioning in practice remains limited. In the Dutch context, available knowledge is mainly based on policy documents, guidance materials, and project-level evaluations, which describe intended objectives and procedural arrangements but provide little insight into how the approach is experienced and interpreted by different actors. Addressing this knowledge gap therefore requires an analysis of stakeholder perspectives as an empirical starting point for identifying the recurring mechanisms and trade-offs that shape how the two-phase procurement approach functions in Dutch infrastructure projects.

1.5. Research Objective and Questions

The objective of this research is to analyse how stakeholders in Dutch infrastructure projects experience, interpret, and evaluate the two-phase procurement approach in practice. It focuses on how its key elements are perceived by different actors involved in project delivery.

By analysing the perspectives, the research aims to identify recurring patterns in how the two-phase procurement approach is valued and criticised. These patterns provide insight into the trade-offs and mechanisms that shape how the approach functions in practice. This objective is addressed through the following main research question:

How do stakeholders in Dutch infrastructure projects perceive and evaluate the two-phase procurement approach in relation to its intended objectives?

Accordingly, four sub-questions structure the analysis: they examine why the approach was introduced, identify its main expected benefits and weaknesses, explore how stakeholders experience and interpret the approach in practice, and assess the extent to which these evaluations converge or diverge.

1. Why was the two-phase procurement approach introduced in Dutch infrastructure procurement?
2. What are the main expected benefits and weaknesses associated with the two-phase procurement approach in Dutch infrastructure projects?
3. How do stakeholders experience and interpret the two-phase procurement approach in practice?
4. To what extent do stakeholder perspectives on the two-phase procurement approach converge or diverge?

1.6. Relevance

Given the scale, urgency, and complexity of current challenges in Dutch infrastructure, the societal consequences of ineffective project delivery are becoming increasingly severe. Infrastructure projects are financed with public funds and carried out in an already heavily used network, which means that cost overruns, delays, and disruptions do not only affect project budgets, but also public safety, accessibility, and everyday mobility. Procurement choices therefore have direct societal implications. Insight into how infrastructure projects are organised and procured, and into how the two-phase procurement approach functions in practice, is essential to ensure that public resources are used responsibly and that expectations about this approach are realistic.

The research is also scientifically relevant. Despite the growing use of the two-phase procurement approach in Dutch infrastructure projects, there is very limited academic research on how this approach functions in practice. Existing knowledge is largely based on policy documents, guidance materials, and project evaluations. The two-phase procurement approach can be considered a specific form of Early Contractor Involvement (ECI), for which the literature discusses a range of expected benefits and weaknesses. However, it remains unclear which of these can actually be observed in the context of the two-phase procurement approache. Much less is known about how different stakeholders experience the approach and what the different perspectives are.

Finally, this research is relevant within the MSc Complex Systems Engineering and Management (CoSEM) programme. Infrastructure is a complex system in which technical aspects, different organisations, and human behaviour are closely connected. The approach illustrates how formal procedures interact with informal practices, expectations, and interpretations of different stakeholders. By focusing on perspectives and using Q-methodology to analyse patterns in how the approach is evaluated, this study addresses core CoSEM themes such as complexity, dealing with uncertainty, and the interaction between technical and social systems.

1.7. Thesis outline

This thesis consists of ten chapters, followed by the references and appendices. Chapter 2 presents the methodological framework of the study, describing the mixed-methods research design and the application of Q-methodology. Chapter 3 provides the conceptual and contextual background by tracing the development of procurement models in infrastructure projects. Chapter 4 reviews the literature on Early Contractor Involvement and positions the two-phase procurement approach within this body of work.

Chapter 5 describes the design and execution of the Q-study, including the development of the statement set and the data collection procedure. Chapter 6 presents the results of the Q-analysis, identifying the stakeholder perspectives that emerged and outlining key areas of convergence and divergence between them. Chapter 7 interprets these perspectives in relation to the literature and the intended objectives of the two-phase procurement approach.

Chapter 8 translates the findings into practical implications for the application of the two-phase procurement approach in infrastructure projects. Chapter 9 reflects on the methodological and substantive limitations of the study and identifies directions for future research. Finally, Chapter 10 concludes the thesis by synthesising the main findings and answering the main research question.

2

Methodology

This chapter outlines the methodological approach and research design of the study. It explains the use of a mixed-methods approach with Q-methodology and describes how the research steps were organised to address the research questions.

2.1. Research Approach: Mixed Methods Using Q-Methodology

This study adopted a mixed-methods research approach, using Q-methodology as its main method. The objective was not to test predefined hypotheses, but to explore how stakeholders interpreted the two-phase procurement approach in practice and how their perspectives related to its intended objectives.

Q-methodology was well suited to this purpose. Developed by Stephenson (1935), the method treats subjectivity not as bias, but as a meaningful source of data. It combines qualitative interpretation with quantitative analysis by asking participants to rank statements and analysing patterns in these rankings (Brown, 1996; Watts and Stenner, 2005). This allows perspectives to be compared in a systematic way while remaining grounded in participants' reasoning.

In policy research, Q-methodology has proven especially valuable in contexts where multiple and often conflicting perspectives coexist. Policy problems are rarely neutral; what may appear to be objective assessments are shaped by competing frames, interests and values (Brown, 1974; Howlett, 2009; Scharpf, 2000). In infrastructure projects, public clients, contractors, engineers and consultants bring different expectations and priorities, leading to different interpretations of both problems and solutions (Rittel and Webber, 1973; Ansell and Gash, 2008). These differences influence how debates develop and how decisions are interpreted (Vanhoonacker and Wangen, 2016).

2.2. Research Design: From Contextual Analysis to Stakeholder Perspectives

Part I — Context of the Research

The first part of the research established the context in which the two-phase procurement approach emerged and was debated. This context is relevant because stakeholder perspectives are shaped by existing discussions in both academic literature and practice.

This part consisted of two steps. First, a document analysis was carried out to examine how the two-phase procurement approach was framed in policy documents, official guidelines and sector reports. In addition, publicly available evaluation reports, consultancy studies, news articles and professional commentaries were included, as these

sources often reflect practical experiences and emerging lessons not yet formalised in academic literature. Second, a literature review was conducted to identify central themes in academic debates on Early Contractor Involvement. This review provided the conceptual basis for understanding the expected benefits and weaknesses of the approach.

Together, the literature review and document analysis resulted in a structured overview of why the two-phase procurement approach was introduced and which benefits and weaknesses were expected. This overview formed the basis for answering the first two sub-questions: *1. Why was the two-phase procurement approach introduced in Dutch infrastructure procurement?*. *2. What are the main expected benefits and weaknesses associated with the two-phase procurement approach in Dutch infrastructure projects?*

Part II — Capturing Stakeholder Perspectives

The second part of the research examined how stakeholders in Dutch infrastructure projects perceived and interpreted the two-phase procurement approach in practice, and to what extent these perspectives converged or diverged. To examine this, the study used Q-methodology.

In this part, a broad set of statements about the two-phase procurement approach was first compiled, reflecting different viewpoints found in academic literature and practice-oriented sources. From this collection, a balanced selection of statements was made. These statements were then discussed with stakeholders involved in Dutch two-phase projects. Participants were asked to rank the statements based on the extent to which they agreed or disagreed with them. After completing the ranking, participants explained and reflected on their choices during a follow-up interview. The ranked statements were subsequently analysed to identify shared patterns across participants, after which these patterns were interpreted to describe distinct stakeholder perspectives. This addressed the last two sub-questions: *3. How do stakeholders perceive and interpret the two-phase procurement approach in practice?*. *4. To what extent do stakeholder perspectives on the two-phase procurement approach converge or diverge?*

Figure 2 illustrates the research design described above, showing how the different research phases, methods and analyses relate to one another.

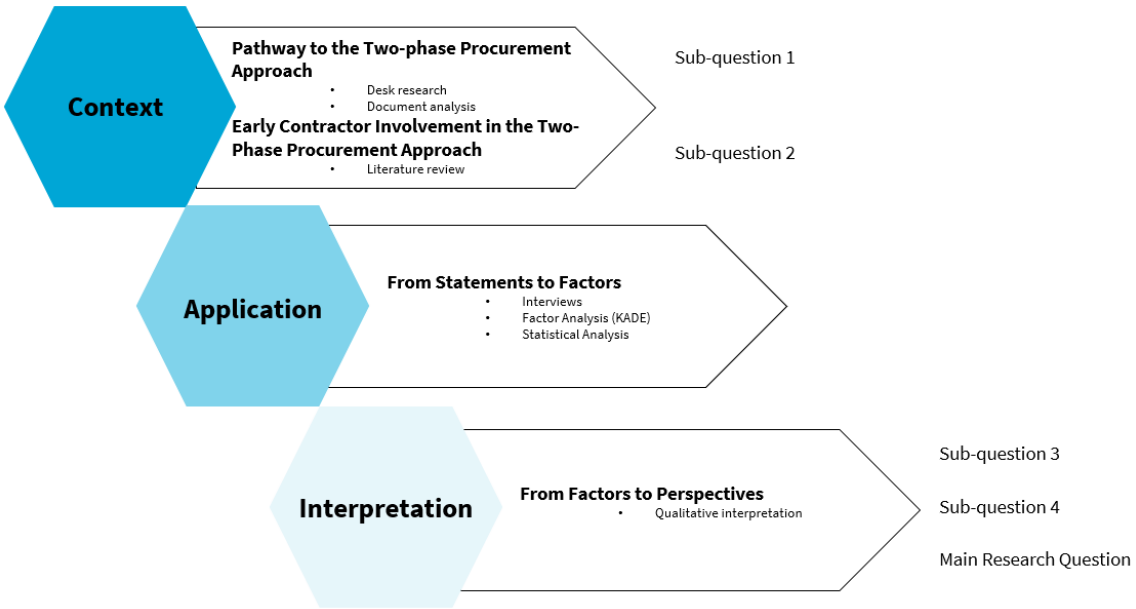

Figure 2: Research Flow Diagram

2.3. Literature Review: Scope, Search Strategy and Thematic Focus

The literature review was conducted to identify relevant academic literature on fragmentation in infrastructure projects, project delivery models, and ECI. The database Scopus served as the primary source for identifying academic publications, as it enables systematic keyword-based searches across peer-reviewed journals. For literature on fragmentation and project delivery models, the search process was exploratory in nature. Relevant studies were identified through a combination of broad keyword searches, screening of titles and abstracts, and forward and backward snowballing based on frequently cited publications, allowing for a contextual understanding of important debates and concepts.

In contrast, the review of ECI literature was conducted in a more structured manner. The purpose of this review was to identify the expected benefits and weaknesses and to derive key themes of the two-phase procurement approach. Searches were performed using predefined keywords related to ECI, two-stage procurement, and the construction and infrastructure domain (Table 3). The search was limited to English-language publications published between 2009 and 2026. Forward and backward snowballing was subsequently applied to identify additional relevant studies. The relevance of publications was assessed based on title, abstract, publication year, and publication type.

Table 3: Keywords Literature Review

Research topic	Keywords
Early contractor involvement	'early contractor involvement', 'early contractor participation'
Two-stage procurement	'two stage tendering', 'two stage procurement'
Application domain	'construction', 'infrastructure', 'built environment'

2.4. Desk Research: Practice-Oriented Document Analysis

The desk research combined document analysis with an exploratory research step and focused on understanding fragmentation in infrastructure projects, the functioning of different project delivery models in the Dutch context, and the two-phase procurement approach. It drew exclusively on grey literature and complemented the academic literature review by providing insight into how procurement approaches were described, interpreted, and applied in practice. In particular, the desk research supported the interpretation of how the two-phase procurement approach was positioned in relation to traditional and integrated delivery models.

The document analysis included guidance documents and handbooks on the two-phase procurement approach issued by public clients, as well as policy documents, evaluation reports, and publicly available materials from governmental and semi-governmental organisations and the private sector. In addition, professional publications, opinion pieces, and other practice-oriented sources were included as part of an exploratory search. The desk research primarily focused on the Dutch context, while also considering international examples of two-stage and ECI approaches where relevant.

The desk research also played a role in identifying relevant practice-oriented sources that were subsequently used in Step 1 of the Q-methodology. Documents were examined not only for their content, but also to determine their suitability as input for the concourse. In this process, recurring arguments, concerns, and viewpoints regarding the two-phase procurement approach were identified. These sources and expressions provided input for the construction of the concourse, as further explained in Chapter 2.6.

2.5. Q-methodology: Q-Study Design and Implementation

This section outlines the design of the Q-study used to explore how stakeholder in Dutch infrastructure projects perceive the two-phase procurement approach. The design of the Q-study follows the six-step framework proposed by Exel and Graaf (2005). These steps are: (1) Definition of the Concourse; (2) Development of the Q-set; (3) Selection of the P-set, and (4) Collecting Q-sorts, (5) Q-analysis and (6) Interpretation.

2.6. Step 1: Definition of the Concourse

The concourse refers to "the flow of communicability surrounding any topic" and captures the range of ideas, opinions, arguments, beliefs, and viewpoints expressed about an issue (Brown, 1993). Within Q-methodology, the concourse represents the theoretical population from which the Q-set (Step 2), the structured sample of statements used in the Q-sort (Step 4), is drawn (Brown, 1993; Exel and Graaf, 2005). Its role is to ensure that the study is grounded in a broad and diverse representation of the discourse, capturing the range of viewpoints expressed on the topic (Kampen and Tamás, 2014; Hermans et al., 2012) and enabling the identification of distinct subjective viewpoints (Duncan Millar et al., 2022).

Because Q-methodology focuses on the systematic study of subjectivity (Brown, 1993; Steelman and Maguire, 1999), statements included in the concourse reflect opinions, attitudes, values, and beliefs rather than objective facts (Brown, 1993). The concourse is therefore understood as a structured representation of how an issue is discussed within a broader discourse (Exel and Graaf, 2005; Steelman and Maguire, 1999). To develop such a representation for this study, statements were collected systematically from multiple sources. This approach contributed to the construction of a Q-set that reflected the concourse and captured the main viewpoints and the range of perspectives on the topic (Brown, 1993). These sources were selected to ensure that the concourse reflected both established theoretical perspectives and how the two-phase procurement approach is discussed and experienced in practice. In line with Q-methodological guidance, statements were drawn from academic literature, policy and professional documents, media and public discourse, and other qualitative materials, each contributing a distinct layer of the broader discourse surrounding the approach (Brown, 1993; Exel and Graaf, 2005; Molenveld, 2020).

2.6.1. Statements Derived from Academic Literature

Academic literature was used to ensure that the concourse reflected established theoretical and empirical insights relevant to the two-phase procurement approach. In line with Q-methodological practice, peer-reviewed papers, essays and books were used to identify key concepts, debates and recurring themes within the discourse (Exel and Graaf, 2005; Molenveld, 2020; Watts and Stenner, 2005).

2.6.2. Statements Derived from Policy and Professional Documents

Policy and professional documents were included to capture institutional and practice-oriented perspectives on the two-phase procurement approach. In Q-methodological studies, such sources are commonly used to reflect formalised positions, professional norms and sector-specific interpretations of an issue (Molenveld, 2020; Eeten, 2001).

2.6.3. Statements Derived from Media and Public Discourse

Media and public discourse sources were included to ensure that the concourse also reflected how the two-phase procurement approach is discussed outside academic and institutional settings. Such sources capture a more informal layer of the discourse, revealing how practitioners, commentators and sector experts talk about the approach in public-facing communication (Brown, 1993; Exel and Graaf, 2005; Duncan Millar et al., 2022).

2.6.4. Statements Derived from Other Qualitative Materials

In addition to written sources, qualitative materials were included to capture how stakeholders articulate their views in direct interaction. Within Q-methodology, such materials are valued for providing a close reflection of actors' own language and reasoning (Brown, 1993; Exel and Graaf, 2005; Minkman et al., 2017; Molenveld, 2020).

2.6.5. Statement Collection and Refinement

For the collection of statements from the sources that together formed the concourse, this study used a combination of inductive and deductive strategies (Molenveld, 2020). Inductive approaches, such as the collection of verbatim expressions from qualitative materials, were used to capture the authentic language, reasoning and framing employed by stakeholders (Minkman et al., 2017; Molenveld, 2020). In parallel, a deductive strategy was applied by drawing on existing theoretical frameworks and concepts identified in the academic literature, ensuring that the concourse reflected key themes and debates relevant to the two-phase procurement approach (Exel and Graaf, 2005). Together, these strategies resulted in a broad pool of statements from which a Q-set could subsequently be constructed, representing different aspects of the topic (Exel and Graaf, 2005; Watts and Stenner, 2005).

In collecting statements, particular attention was paid to minimising researcher bias during the initial compilation of the concourse (Kampen and Tamás, 2014; Minkman et al., 2017). In line with standard Q-methodological practice, statements drawn from the various source types were collected as literally as possible from the original material. This approach aimed to avoid premature interpretation or analytical framing by the researcher at this stage, allowing the perspectives embedded in the discourse to remain intact (Kampen and Tamás, 2014).

Following this initial collection phase, the statements were reviewed for their relevance to the two-phase procurement approach. Statements considered insufficiently relevant were removed from the concourse. To facilitate comparison across statements in the subsequent Q-sorting phase, the remaining items were reformulated to begin with "*The two-phase procurement approach …*". Throughout this refinement process, the original wording of each statement was altered as little as possible in order to preserve its intended meaning.

2.7. Step 2: Development of the Q-set

After defining the concourse, the next step in Q-methodology is to select a subset of statements to form the Q-set, or Q-sample (Brown, 1993; Exel and Graaf, 2005). This step reduces the concourse to a manageable number of statements. Although this selection involves qualitative judgement and is often described as "more an art than a science" (Exel and Graaf, 2005; Watts and Stenner, 2005), its purpose is not completeness but adequate coverage of the discourse relevant to the research question (Watts and Stenner, 2005). In Q-methodology, a relatively limited number of statements is sufficient to capture the main viewpoints, provided that major gaps and redundancies are avoided (Kampen and Tamás, 2014; Watts and Stenner, 2005).

The Q-set thus serves as a concise representation of the viewpoints expressed in the concourse and forms the basis for the factor analysis in Step 5, which identifies patterns of shared subjectivity among participants (Brown, 1993; Exel and Graaf, 2005; Kampen and Tamás, 2014).

2.7.1. Sampling Method Statements

In Q-methodology, statements for the Q-set can be selected using either unstructured or structured sampling approaches, which differ in the extent to which an organising framework is applied to the concourse (Kampen and Tamás, 2014).

Unstructured sampling involves selecting statements directly from the concourse without predefined categories or guiding principles. While this approach offers flexibility, it carries a considerable risk of bias, as the selection may reflect the intuitive preferences of the researcher or lead to an uneven representation of themes within the discourse

(Exel and Graaf, 2005; Steelman and Maguire, 1999; Brown, 1970). As a result, unstructured sampling may fail to ensure sufficient variation among statements and can lead to the over- or undersampling of particular subjective areas (Exel and Graaf, 2005; Steelman and Maguire, 1999).

Structured sampling, by contrast, uses an explicit framework to guide the selection of statements and is therefore commonly preferred in Q-methodology. This approach draws on principles of experimental design and applies a theoretical structure—derived either deductively from the literature or inductively from the concourse—to organise statements systematically (Brown, 1993; Brown, 1970; McKeown and Thomas, 1988; Exel and Graaf, 2005).

In this study, a deductive form of structured sampling was used. Statements were organised according to the thematic framework derived from the Early Contractor Involvement literature discussed in Chapter 4. These themes provided a guiding structure to support balanced coverage of the concourse and to reduce researcher bias during the selection process, in line with Q-methodological recommendations (Kampen and Tamás, 2014; Minkman et al., 2017).

2.7.2. Number of Statements

Q-methodology is commonly described as a small-N approach, both in terms of the number of participants and the number of statements included in the Q-set (Molenveld, 2020). As the Q-set is selected from a much larger concourse, its size requires careful consideration. The literature generally emphasises that the Q-set should be large enough to capture the breadth of the discourse, while remaining manageable for participants during the sorting task (Brown, 1996; Exel and Graaf, 2005; Watts and Stenner, 2005).

Studies typically employ Q-sets of moderate size, as very small sets may fail to represent the concourse adequately, while very large sets (e.g., over 60 statements) can make the sorting process unnecessarily demanding for respondents (Minkman and Molenveld, 2020; Watts and Stenner, 2005). Rather than adhering to a fixed number, the appropriate size of a Q-set depends on the complexity of the topic and the need to balance coverage and feasibility.

In this study, the size of the Q-set was guided by the thematic structure derived from the literature. An even distribution of statements across themes served as a guiding principle to support balanced representation of the discourse, while allowing flexibility to include additional statements when these offered a distinctive or conceptually important perspective not yet covered within a theme.

2.7.3. Selection and further Refinement of Statements

Following the construction of the structured concourse, statements were selected in line with the structured sampling approach described in this chapter. Selection was guided by the thematic framework derived from the literature, ensuring that statements reflected the breadth of the discourse across the identified dimensions.

To support diversity within the Q-set, several criteria commonly used in Q-methodology were applied during the selection process. These included the inclusion of statements that appeared across multiple sources, statements addressing recurring issues within the infrastructure sector, and statements that represented distinct or contrasting viewpoints within the discourse. In addition, preference was given to statements that were sufficiently specific, avoiding overly generic or self-evident formulations.

During this stage, each statement was reviewed to ensure that it expressed a single, clear proposition that could be positioned along a continuum of agreement or disagreement. Where necessary, statements were reformulated to improve clarity while preserving their original intent (Molenveld, 2020; Watts and Stenner, 2005). Finally, terminology was standardised to ensure consistency with language commonly used by practitioners in the sector.

2.8. Step 3: Selection of the P-set

In the third step of Q-methodology, the participants who perform the Q-sort are selected; this group is referred to as the P-set. In Q-studies, the P-set does not need to be large. Instead, participants are selected purposively to ensure that their viewpoints are relevant to the topic under study (Brown, 1993; Exel and Graaf, 2005). The emphasis is therefore on the inclusion of meaningful perspectives rather than on statistical representativeness.

2.8.1. Participant criteria

In line with the purposive sampling logic of Q-methodology, participants were selected based on the relevance of their perspectives to the research question (Shinebourne, 2009). To guide this process, three inclusion criteria were applied:

- **Direct involvement in a two-phase project:** Participants were required to have been directly involved in at least Phase 1 of a two-phase project. Involvement in Phase 2 was not required, as only a limited number of projects had progressed to that phase at the time of the study. This criterion ensured that the perspectives expressed were grounded in first-hand experience with the core characteristics of the two-phase approach.
- **Extensive professional experience:** Participants were required to have a minimum of ten years of experience in the construction industry. This criterion supported reflection on the two-phase procurement approach in relation to other procurement approaches, project delivery models and broader sector developments.
- **Relevant organisational background:** Participants were employed by contractors, engineering firms, consultancy organisations or public clients. This ensured that the P-set captured perspectives from both the client and market side and reflected the range of actors typically involved in two-phase projects.

Sampling strategies Participants

To identify suitable participants and capture a broad range of viewpoints, two complementary sampling strategies were used (Danielson, 2009):

- **Structured approach:** An initial list of eligible participants from relevant organisations was compiled and approached directly. This approach supported the inclusion of participants with demonstrated expertise and aligns with the Q-methodological principle of generating variation in viewpoints rather than numerical representativeness (Steelman and Maguire, 1999).
- **Snowball sampling:** Participants were invited to recommend others who met the selection criteria and might contribute different perspectives. This strategy helped to reduce redundancy and increased the likelihood that diverse viewpoints were included (Exel and Graaf, 2005).

The combined use of these strategies supported the inclusion of participants from both public clients and contractors, as well as from different organisations involved in two-phase projects. In addition, attention was paid to including participants with both supportive and critical views of the two-phase procurement approach, in order to maximise diversity within the P-set.

2.8.2. Number of Participants

As with the construction of the Q-set, Q-methodology follows a small-N logic in the selection of participants, where the aim is not statistical representativeness but the inclusion of sufficient diversity of viewpoints (Danielson, 2009). Consequently, the size of the P-set is typically limited, and smaller than the Q-set, with emphasis placed on variation rather than quantity (Exel and Graaf, 2005; Brown, 1993).

Studies commonly report P-sets ranging from 10 and 50 participants, depending on the complexity of the topic and the diversity of viewpoints to be captured (Danielson, 2009). Increasing the number of participants beyond what is necessary to reveal the main viewpoints is generally considered to add little analytical value.

In this study, the size of the P-set was guided by the aim to include a sufficiently diverse range of perspectives relevant to the two-phase procurement approach, rather than by adherence to a predetermined numerical target.

2.9. Step 4: Collecting Q-sorts

After the Q-set and P-set had been established, the Q-sorts were collected. In this process, participants constructed a Q-sort by ranking the statements according to the extent to which they recognised or identified with them in relation to the two-phase procurement approach. In this study, the Q-sorting process consisted of two stages: a preliminary sorting and the subsequent placement of statements into the fixed Q-sorting scheme. Following the completion of the Q-sort, a follow-up interview was conducted with each participant.

2.9.1. Q-procedure

In the first stage, participants completed a preliminary sorting by dividing all statements into three piles: *disagree*, *neutral*, and *agree* (Duncan Millar et al., 2022). This step served to familiarise participants with the statements and to support reflection prior to the final sorting task.

In the second stage, participants placed the statements from each pile into the fixed Q-sorting scheme, using the sorting statement on the two-phase procurement approach as their guiding reference (Exel and Graaf, 2005). Participants were instructed to begin with the extreme positions (most disagree and most agree) and then work towards the centre of the distribution. During this process, statements could be reconsidered and repositioned until the final configuration adequately reflected the participant's viewpoint.

Once the Q-sort had been completed, a follow-up interview was conducted within the same session. During this interview, statements were discussed sequentially. Participants were first asked to explain their reasoning behind the statements placed at the extreme ends of the distribution, as these positions represent the most salient expressions of their viewpoint (Brown, 1993; Duncan Millar et al., 2022). When time permitted, additional statements were discussed to further clarify participants' perspectives.

The interviews were structured in a statement-centred manner, with participants asked to reflect on their ranking of each discussed statement. All interviews were conducted via Microsoft Teams and were transcribed verbatim. The resulting transcripts linked participants' explanations directly to specific statements in the Q-sort.

2.9.2. Q-sorting Environment

Q-sorts can be conducted either in person or digitally, with previous research indicating that both formats yield comparable results (Exel and Graaf, 2005). In this study, the Q-sorts were conducted digitally via Microsoft Teams. Participants shared their screen during the session, allowing the researcher to observe the sorting process in real time and provide clarification where necessary.

The Q-sort procedure was implemented using EQ Web Sort, an online platform designed specifically for conducting Q-sorts (Banasick, 2023). This platform replicates the traditional card-sorting procedure in a digital environment and enables consistent data collection. The interface supported the two-stage sorting process and allowed participants to review and reposition statements as needed. Completed Q-sorts could be exported directly for subsequent analysis.

2.9.3. Q-sorting Scheme

In Q-methodology, participants rank the statements within a fixed sorting scheme, typically a quasi-normal or pyramid-shaped distribution ranging from most disagree to most agree (Brown, 1993). This fixed distribution functions as a forced-choice structure, requiring participants to assign a predefined number of statements to each rank position. By limiting the available positions per column, the scheme encourages deliberate trade-offs and clearer differentiation between statements (Duncan Millar et al., 2022). Although the distribution guides how viewpoints are expressed, its specific range and shape are considered arbitrary and do not affect the subsequent statistical analysis (Brown, 1993).

The choice of distribution can be adjusted depending on participants' familiarity with the topic. When participants are expected to hold well-developed views, a flatter distribution is recommended to allow greater differentiation between statements (Exel and Graaf, 2005).

In this study, the sorting scheme shown in Figure 3 was used. It consisted of a symmetric distribution ranging from −4 (most disagree) to +4 (most agree). This relatively flat distribution was considered appropriate given the participants' level of experience and their expected familiarity with the two-phase procurement approach.

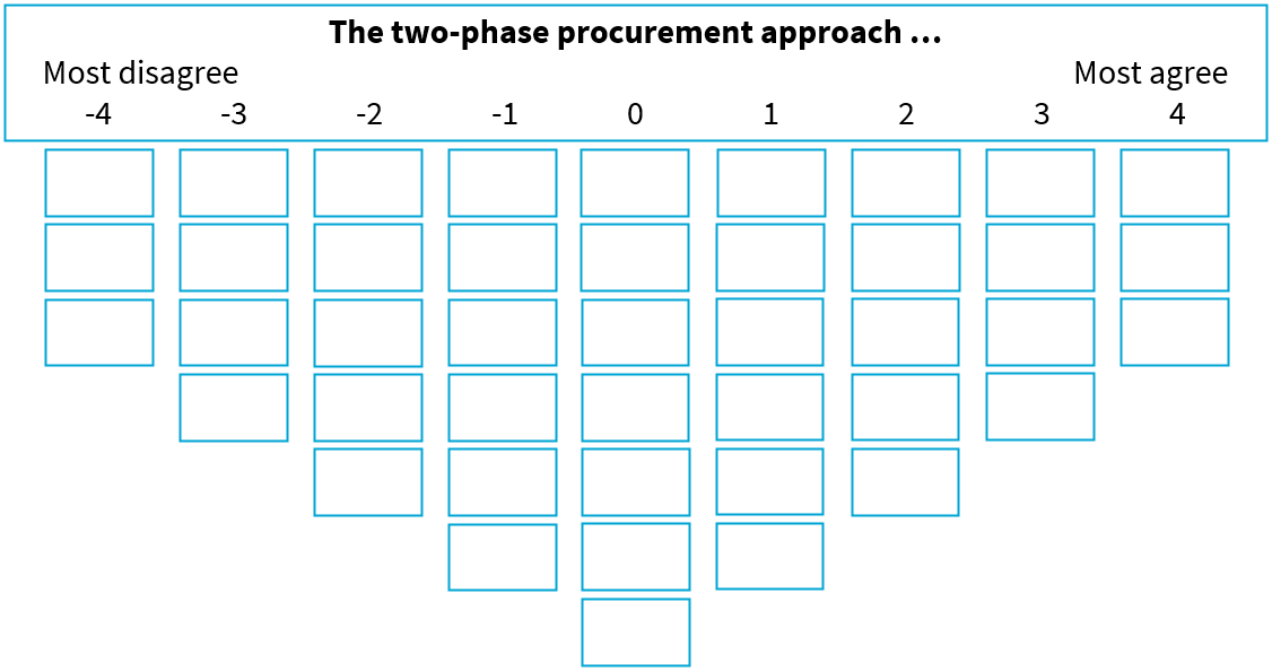

Figure 3: Q-sorting scheme

2.9.4. Pilot Test

Prior to administering the Q-sorts, a pilot test was conducted to assess the clarity and adequacy of the Q-set and the accompanying instructions. For this purpose, the complete set of statements and the procedural guidelines were reviewed by two practitioners with experience in two-phase projects, as well as by the academic supervisor of this thesis. The reviewers evaluated whether the statements were clearly formulated, free from unnecessary ambiguity, and aligned with the intended scope of the study. In addition, they assessed whether the instructions enabled participants to complete the sorting procedure in a clear and comprehensible manner.

2.10. Step 5: Q-analysis

After the Q-interviews had been completed, the collected Q-sorts were analysed as part of Step 5 of the Q-methodology. The analysis was conducted using the KADE software package (Banasick, 2025). This step involved a sequence of analytical procedures aimed at identifying statistically meaningful patterns in how participants ranked the statements.

Prior to the factor analysis, a preliminary screening of the P-set was conducted to ensure that all participants met the predefined inclusion criteria. Q-sorts that did not meet this criterion were excluded from further analysis.

2.10.1. Correlation Matrix

As a first analytical step, a correlation matrix was constructed to examine the degree of similarity between individual Q-sorts. Correlations in Q-methodology are calculated by comparing the relative ranking patterns of statements across Q-sorts and expressing these similarities as coefficients ranging from –1.00 to +1.00 (Brown, 1993). These coefficients indicate the extent to which participants share similar or contrasting viewpoints (Exel and Graaf, 2005).

Although the correlation matrix is a necessary component of the analysis, it is not interpreted substantively. Its primary function is to provide the statistical basis for subsequent factor extraction by identifying patterns of association among Q-sorts (Donner, 2001).

2.10.2. Factor Extraction

The goals of factor extraction is to identify groups of Q-sorts that correlate strongly with each other. A factor represents a shared viewpoint held by a subset of participants, thereby reducing the complexity of the data and revealing the main patterns of meaning that structure relationships between Q-sorts (Brown, 1993; Duncan Millar et al., 2022; Exel and Graaf, 2005).

In Q-methodology, factor extraction is commonly performed using either Centroid Factor Analysis (CFA) or Principal Component Analysis (PCA) (Webler et al., 2009). CFA is the traditional approach and allows greater flexibility in the rotation and interpretation of factors, whereas PCA offers a more standardised and reproducible extraction procedure. PCA is widely applied in contemporary Q-studies, as it is implemented in commonly used software packages and yields factor structures comparable to those produced by alternative extraction techniques (Akhtar-Danesh, 2017). In this study, PCA was used to extract an initial set of factors, resulting in an unrotated factor loadings matrix in which each Q-sort loaded on each extracted factor.

Kaiser-Guttman Criterion

The Kaiser-Guttman criterion is applied as an initial screening tool to identify which number of factors may be suitable for further analysis. This rule of thumb recommends retaining factors with an eigenvalue (EV) greater than 1.00, on the basis that such factors explain more variance than a single variable (Watts and Stenner, 2012; Brown, 1980). However, this criterion typically produces too many factors to be theoretically meaningful (Watts and Stenner, 2012). Therefore, it served only as a first screening tool.

Analysing Factor Rotations

After factor extraction, a varimax rotation was applied to each solution. Varimax is an automated, orthogonal rotation technique that aims to achieve a simple and interpretable factor structure by maximising the variance of squared loadings within each factor. This encourages Q-sorts to load strongly on one factor and weakly on others, thereby supporting the identification of distinct and coherent viewpoints (Watts and Stenner, 2005).

Because the interpretation in this study was based on the rotated factor structures, factor solutions were evaluated on this basis. To determine an appropriate number of factors, the criteria proposed by Webler et al. (2009) were used:

- ***Simplicity:*** A solution with fewer factors is generally easier to interpret, provided that important differences in viewpoints are not lost.
- ***Clarity:*** A factor structure is clearer when respondents load strongly on one factor only, with few confounders or non-loaders.
- ***Distinctness:*** Factors should represent different viewpoints, which is reflected in lower correlations between factors and in a sufficient number of distinguishing statements.
- ***Stability:*** When comparing different solutions, respondent groupings that remain consistent across rotations indicate stable, coherent factors.

Defining Q-sort

In addition to these criteria, a robust factor solution requires that each factor is supported by at least two defining Q-sorts (Brown, 1980). A defining Q-sort refers to an individual Q-sort that loads significantly on a single factor and does not load significantly on other factors, indicating a clear statistical association with that factor (Exel and Graaf, 2005). Participants with a high factor loading for a given perspective are said to "define" that perspective (Brown, 1993). To qualify as a defining Q-sort in this study, the following conditions were applied:

1. **Load significantly on a factor**
   In this study, a significance level of 0.01 was used. The threshold for a significant loading is calculated using the formula 2.58 / $\sqrt{N}$, where N is the number of statements (Brown, 1980). Because a factor represents a shared pattern of thinking, this threshold ensures that enough participants contribute to that factor.
2. **Load significantly on a factor with a minimum difference of 0.1 from other factors**
   A Q-sort has to load at or above the significance threshold on a factor and differ by at least 0.1 from its loadings on other factors. This rule helps identify Q-sorts that clearly fit one factor rather than loading across multiple factors.
3. **Meet the communality criterion:** $f^2 > h^2/2$
   The communality value (h^2) indicates how much of each Q-sort's variance is explained by the full set of unrotated factors. To determine whether a Q-sort clearly belongs to a factor, its highest loading is squared (f^2) and compared with half of its communality ($h^2/2$). A Q-sort is considered defining when its squared loading is larger than this value ($f^2 > h^2/2$).

Together, these analytical procedures established the basis for selecting a factor solution that meets the predefined criteria, including the distribution of participants across factors. Subsequently, factor scores were calculated for each statement and factor, providing the basis for constructing composite Q-sorts and for the identification of factor-specific statement patterns.

2.10.3. Identification of Consensus, Distinguishing and Characterising Statements

In the analysis of the selected factor solution, three types of statements are distinguished: consensus statements, distinguishing statements, and characterising statements. Together, these statement types provide the analytical basis for interpreting factor-specific patterns and shared positions across factors.

Consensus statements are statements that do not differ significantly across any of the identified factors. These statements reflect positions on which participants associated with different factors express broadly similar evaluations, despite differences in their overall perspectives (Exel and Graaf, 2005).

Distinguishing statements are statements whose factor scores differ significantly from the scores assigned by other factors. A statement is considered distinguishing when the difference between its factor scores exceeds the threshold for statistical significance ($p < 0.05$), indicating that the statement differentiates one factor from the others (Exel and Graaf, 2005).

Characterising statements are the distinguishing statements that are positioned at the extreme ends of the composite Q-sort of a factor. In this study, these correspond to statements ranked at the highest and lowest positions of the distribution (i.e., +3 and +4, or −3 and −4). Such statements indicate the most salient positions within a factor and capture what a given perspective most strongly endorses or rejects (Exel and Graaf, 2005).

2.11. Step 6: Interpretation

In Step 6 of the Q-methodology, the selected factor solution was interpreted to examine and describe stakeholder perspectives. This step built on the analytical outcomes of Step 5, in particular the composite Q-sorts, the distribution of participants across factors, and the identification of characterising and consensus statements.

The interpretation followed a statement-centred approach. For each factor, the participants whose Q-sorts defined that factor were identified based on the factor loadings. The interpretation then focused on the characterising statements of each factor. Characterising statements were defined as statements positioned at the extreme ends of the composite Q-sort (i.e., +3 and +4, or −3 and −4), as these reflect the strongest points of agreement or disagreement within a perspective.

For each characterising statement, the interview transcripts were revisited to examine how participants defining a given factor explained and motivated their ranking of that statement. Statements made by different participants about the same statement were considered together. In this way, qualitative explanations were directly linked to the statistical patterns observed in the Q-analysis and used to provide contextual insight into participants' reasoning (Brown, 1993).

The same procedure was applied to the consensus statements identified in Step 5. For these statements, explanations from participants associated with different factors were examined to identify shared lines of reasoning and areas of common understanding across perspectives.

PART I

Context of the Research

3

Pathway to the Two-phase Procurement Approach

This chapter provides an overview of the development of procurement and project delivery approaches in the Dutch construction sector. It situates the two-phase procurement approach within this broader development by discussing the relevant characteristics of fragmentation and commonly used project delivery models. The chapter addresses the first sub-question: *Why was the two-phase procurement approach introduced in Dutch infrastructure procurement?*

3.1. Fragmentation in Construction Sector

3.1.1. Fragmentation

The construction sector has long been characterised by fragmentation. In general terms, fragmentation refers to the division of a whole into separate parts (Kulakov, 2024). In construction projects, it describes a situation in which activities, project phases, and involved organisations are poorly connected (Alashwal and Abdul-Rahman, 2011. This lack of integration and coordination has repeatedly been identified as a source of communication problems and inefficiencies in construction projects (Tijhuis and Maas, 1996).

A typical construction project involves multiple parties, including public clients, design and engineering consultants, contractors, and suppliers. These actors participate at different moments and with varying degrees of involvement throughout the project. Because tasks are divided according to specialised expertise and organised in successive phases, collaboration between parties is often limited.

Concerns about fragmentation are not new. The reports by Latham (1994) and Egan (1998) already identified fragmentation as a key cause of inefficiency, low productivity, and weak project performance. They argued for more integrated ways of organising construction projects. Later academic studies have confirmed this diagnosis and continue to describe fragmentation as a structural characteristic of the construction sector (Adriaanse, 2014; Kagioglou et al., 2000; Riazi et al., 2020; Vrijhoef, 2011).

Traditional procurement models reflect this fragmentation. By organising design, construction, and other activities in relative isolation, they limit interaction between phases and stakeholders (Riazi et al., 2020). At the same time, these models strongly influence how projects are delivered by fixing roles and project choices, leaving limited room for adjustment or joint decision-making during later phases. While these arrangements provide clarity and control, they can also discourage collaboration and joint optimisation across project phases (Ahmed, 2014).

3.1.2. Types of fragmentation

Fragmentation in infrastructure projects can be categorised into three main types: vertical, horizontal, and longitudinal (Adriaanse, 2014).

Vertical fragmentation

Vertical fragmentation refers to the strict separation between project phases, most notably between design and execution. This separation is a defining feature of traditional procurement models such as Design–Bid–Build (DBB). Design and execution are organised sequentially, with designers and contractors working largely in isolation and interacting only at formal handover moments (Mohd Nawi et al., 2014; Riazi et al., 2020).

This way of working is sometimes described as a "throw it over the wall" approach. Information is transferred from one phase to the next with limited coordination or feedback (Adriaanse, 2014). As a result, contractors are typically excluded from the early design stages, which diminishes opportunities to influence project decisions with their construction knowledge (Mohd Nawi et al., 2014; Riazi et al., 2020).

Horizontal fragmentation

Horizontal fragmentation arises from the division of work across a large number of specialised organisations operating in parallel within a single project Because projects are complex and require diverse forms of expertise, they are typically delivered by temporary, multi-disciplinary constellations of organisations that come together for the duration of a project (Adriaanse, 2014; Alashwal and Abdul-Rahman, 2011; Riazi et al., 2020).

Contractors usually subcontract a substantial share of the work. In some cases, subcontracted activities account for up to 75 percent of a contractor's turnover (Adriaanse, 2014; Vrijhoef, 2011). This results in a dense network of relatively autonomous actors, each with their own interests, routines, and objectives (Adriaanse, 2014; *De waarde van ketensamenwerking*, 2015).

Because these multi-organisations are temporary, they lack continuity from project to project (Riazi et al., 2020; *De waarde van ketensamenwerking*, 2015), forcing participants into repeated learning curves and increasing the complexity of coordination (Riazi et al., 2020). Relationships are often held together primarily by detailed contracts, which reinforces a low-trust environment (Adriaanse, 2014; Alashwal and Abdul-Rahman, 2011).

Similar patterns have been observed in international projects, where cooperation is often undermined by a contractual mindset focused on self-protection rather than on collaborative, "win-win" solutions (Tijhuis and Maas, 1996).

Longitudinal fragmentation

Longitudinal fragmentation is defined as the division of the construction process into separate projects carried out sequentially over time. It primarily concerns the lack of continuity between projects, particularly with respect to the transfer of information and knowledge (Adriaanse, 2014).

In practice, construction parties are involved in many projects, but collaboration usually ends once a project is completed. As a result, project teams are repeatedly reassembled, requiring new learning curves and reducing overall efficiency (Riazi et al., 2020). The project-based nature of the industry and the constant change in partnerships make it difficult to carry knowledge and experience from one project to the next (Adriaanse, 2014).

Consequently, lessons learned, data, and practical experience are rarely systematically captured or reused. Knowledge that could inform future designs, procurement strategies, or risk management approaches often remains within individual organisations or is lost altogether. This leads to the repeated occurrence of similar coordination problems and design errors, while opportunities for collective learning are missed (Adriaanse, 2014; Riazi et al., 2020).

In the Dutch construction sector, this lack of knowledge continuity has been identified as an important factor contributing to recurring inefficiencies and failure costs (Adriaanse, 2014).

The three types of fragmentation are illustrated in Figure 4.

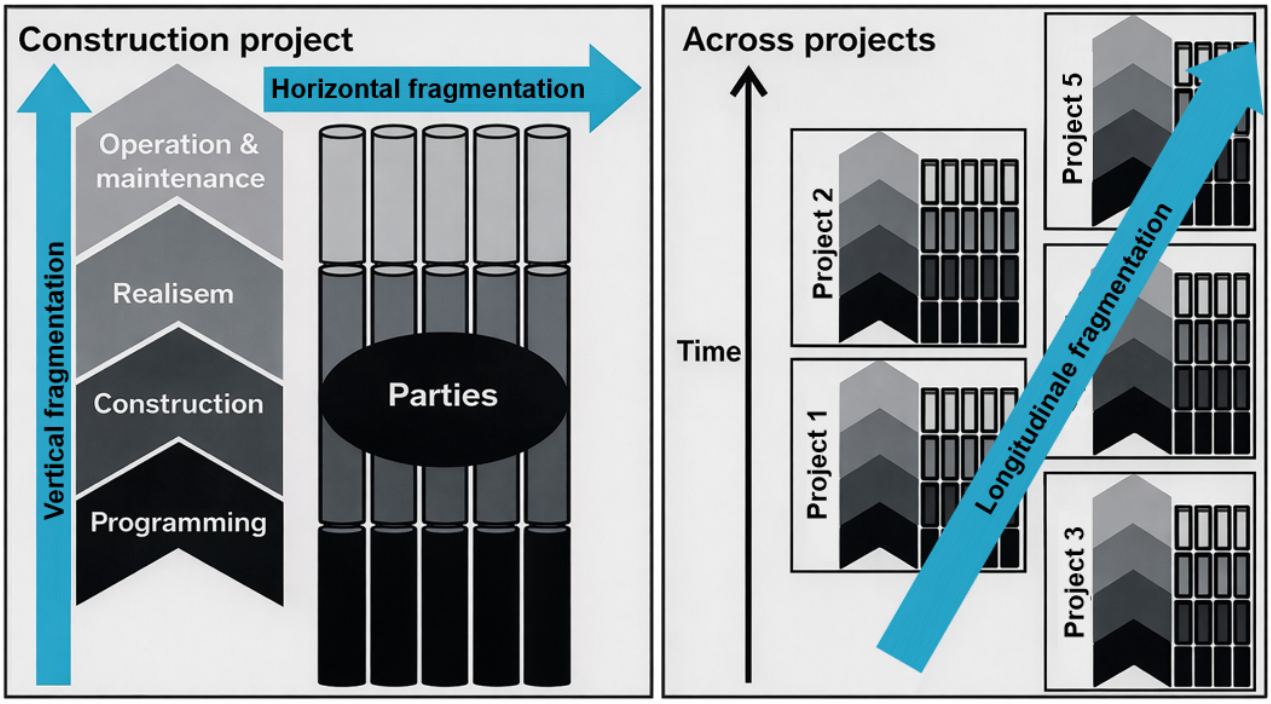

Figure 4: Fragmentation in Construction Projects (adapted from Adriaanse, 2014)

3.1.3. Consequences of Fragmentation for Project Delivery

Fragmentation has several consequences for the delivery and performance of construction projects. It often leads to unclear roles and responsibilities and weakens risk management, which increases the likelihood of cost overruns, delays, and limited value for the public client (Ahmed, 2014; Riazi et al., 2020). When project phases are organised sequentially, poor interface management further amplifies these problems. Design errors are frequently identified only once execution has started, making them costly to correct and increasing the risk of disputes between design and construction parties (Ahmed, 2014; Mohd Nawi et al., 2014). As a result, fragmented processes limit the formation of effective project teams and hinder the continuous flow of information across phases (Riazi et al., 2020).

From an economic perspective, the reliance on temporary project organisations composed of diverse and often misaligned stakeholders leads to high transaction costs and persistent coordination problems (Riazi et al., 2020; Koskela, 2000). Stakeholders tend to optimise their own tasks rather than the overall project, which may improve efficiency at activity level but results in weak performance at project level (Adriaanse, 2014). These structural inefficiencies contribute to failure costs, which in the Dutch construction sector were estimated at around five percent of total turnover in 2019 (Buijs, 2019). Such costs arise from rework, miscommunication, and poorly coordinated interfaces between project phases (Adriaanse, 2014).

Fragmentation also increases the risk of disputes and opportunistic behaviour. The structure of the industry creates multiple points where stakeholders attempt to shift risks to others (Mohd Nawi et al., 2014). Designers often focus on functional or conceptual solutions, while contractors prioritise buildable and low-risk outcomes. These differing objectives can undermine trust and strain collaboration, particularly when contractual arrangements reward self-protection rather than joint problem-solving (Riazi et al., 2020; Mohd Nawi et al., 2014).

Finally, fragmentation limits the sector's capacity to innovate and improve productivity. Because project teams are temporary, lessons learned are rarely transferred to future projects. This prevents the systematic application of best practices and reinforces the repeated occurrence of similar problems (Riazi et al., 2020; Kagioglou et al., 2000).

Together, these persistent inefficiencies have prompted procurement reforms that emphasise earlier collabora-

tion and more integrated delivery approaches (Riazi et al., 2020; Kagioglou et al., 2000; Tijhuis and Maas, 1996). In the Dutch context, these reforms translated into new project delivery models intended to reduce fragmentation and improve project outcomes.

3.2. Project Delivery Models

A project delivery model (PDM) describes how roles and responsibilities are distributed among the parties involved in a project and how these responsibilities are organised across the design, procurement, and execution phases (Oyetunji and Anderson, 2006). In this sense, a PDM provides the basic structure within which a project is developed and delivered. In the Dutch context, a project delivery model is commonly defined as the way tasks within the construction process are divided among the various actors (C. Jansen, 2009).

Although the terms project delivery model, contract model, and contracting strategy are often used interchangeably, this study distinguishes them for clarity. A *project delivery model* concerns the division of roles and responsibilities across project phases. A *contracting strategy* specifies the commercial principles that govern this division, such as risk allocation, payment mechanisms, and incentives (Pishdad-Bozorgi, 2012). A *contract model* formalises these arrangements in legal terms (C. Jansen, 2009). In practice, these elements are closely connected, as standardised contracts are often associated with specific delivery models.

Project delivery models can be grouped into four broad categories: alliance, traditional, integrated, and life-cycle (PIANOo, n.d.-a). These categories represent different ways of structuring collaboration and allocating responsibilities across the project life cycle. They are presented here in an order that reflects differences in the degree and form of involvement of the public client, ranging from direct participation in a joint project organisation to a more distant, output-oriented role. Figure 5 provides an overview of these categories and the main models applied in the Netherlands.

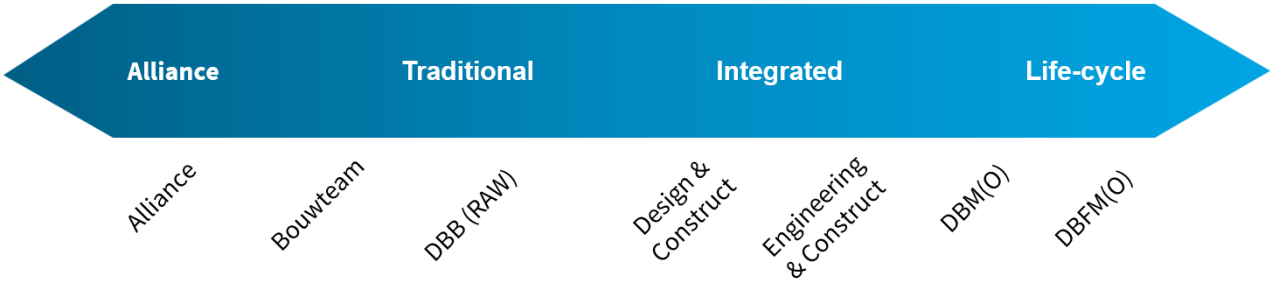

Figure 5: Project Delivery Models (adapted from PIANOo, n.d.-a)

3.2.1. Traditional Delivery Models

Traditional project delivery models, most notably DBB, are characterised by a clear separation between design and construction. Under this model, the public client is responsible for the design, while the contractor is responsible for construction and, where applicable, maintenance (Lenferink et al., 2013). Project phases are organised sequentially and are typically contracted out separately on the market (Bruggeman et al., 2010).

In Dutch practice, the design is formalised in a RAW-bestek, which specifies detailed technical requirements and quantities (Lenferink et al., 2012). During construction, the client supervises compliance with these specifications. Contracts are usually based on the Uniform Administrative Conditions (UAC), which provide a standardised legal framework with clearly defined roles, responsibilities, and control mechanisms (Bruggeman et al., 2010). This clarity and legal certainty are seen as advantages of the DBB model.

At the same time, the strict separation of phases limits flexibility and opportunities for optimisation. Because design must be completed before construction begins, contractors are unable to contribute their expertise during

early project stages. Collaboration is therefore minimal and largely confined to formal contractual moments, reinforcing vertical fragmentation (De Ridder, 1994). While this structure supports transparency and control, it reduces the capacity to adapt designs based on construction insights.

Given the long duration and complexity of most infrastructure projects, changes to scope and design are almost inevitable (Hertogh et al., 2008). Under DBB, such changes often lead to lengthy negotiations, as modifications fall outside the original tender documents. Managing variations therefore absorbs significant time and resources and can strain the relationship between public client and contractor (Walker, 2015).

Another challenge lies in the procurement procedure itself. DBB's are often awarded through open tendering, with limited pre-selection of bidders. Formally, contracts may be awarded on the basis of the lowest price, the lowest life-cycle cost, or the Best Price–Quality Ratio (BPKV, from the Dutch *beste prijs–kwaliteitverhouding*) (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2012). In practice, however, traditional DBB projects still tend to focus primarily on price, despite policy efforts to promote the principle of "BPKV, unless" in order to encourage a better balance between cost and quality (PIANOo, n.d.-c). For a more detailed explanation of the Dutch procurement framework and award principles, see Appendix A.

This competitive dynamic increases transaction costs for both clients and contractors. Multiple bidders invest substantial resources in tendering, while only one contract is awarded. Unsuccessful bidders must recover these costs elsewhere, which can either inflate future bids or place downward pressure on quality (Walker, 2015). In some cases, contractors submit unrealistically low bids to secure a project, expecting to compensate for losses through claims and change orders during execution. This so-called "bid low, claim later" practice contributes to adversarial relationships and recurrent disputes between clients and contractors (Bourn, 2007; Wolstenholme et al., 2009).

3.2.2. Bouwteams

A Bouwteam is a Dutch variant of the traditional DDB model in which contractor expertise is brought into the project at an earlier stage. The client remains responsible for the design and overall project management, while the contractor contributes practical and technical knowledge to improve feasibility and constructability (PIANOo, n.d.-b; Bruggeman et al., 2010).

In practice, the Bouwteam can take different contractual forms. In a traditional Bouwteamovereenkomst, the contractor contributes expertise during the design phase and is subsequently given an exclusive opportunity to agree on an execution price. If no agreement is reached, the contractor may bear part of the costs incurred during the preparatory phase. Alternatively, public clients may opt for a more integrated arrangement in which the contractor is responsible for both design and execution under a fixed-price agreement, often while significant uncertainties regarding risks still remain (Loeff, n.d.).

3.2.3. Integrated and Life-cycle Delivery Models

In contrast to traditional delivery models, integrated and life-cycle delivery models combine multiple project phases within a single contract. Rather than separating design and construction, these models integrate design, construction, and sometimes additional phases from the outset, thereby reducing the traditional fragmentation of the project process (Koskela, 2000). Instead of providing a detailed design, the client typically specifies functional requirements and performance objectives, leaving greater freedom for the contractor to develop technical solutions (De Ridder, 1994). As a result, the role of the client becomes less directive, while the contractor assumes a more proactive role compared to traditional models (Bruggeman et al., 2010). This shift reflects the broader principle of "market, unless", in which responsibilities are placed with the market unless there is a clear reason for the public client to retain them.

In the Netherlands, this development is reflected in the increasing use of Design & Construct (D&C) and Engineering & Construct (E&C) contracts (Adriaanse, 2014). These contracts form part of a broader group of integrated delivery models in which design and construction are combined within a single contractual arrangement. Life-cycle

models extend this integration further by also incorporating maintenance, operation, and sometimes financing, such as Design–Build–Maintain (and Operate) (DBM(O)) and Design–Build–Finance–Maintain (and Operate) (DBFM(O)) (PIANOo, n.d.-a). By aligning responsibilities across multiple phases of the asset life cycle, these models aim to create stronger long-term incentives and encourage whole-life optimisation (Adriaanse, 2014; Vrijhoef, 2011).

Integrated and life-cycle delivery models were widely embraced because they promised greater efficiency and a more effective use of contractor expertise. By allocating broader responsibilities to the contractor, these models were expected to shorten completion time, make better use of market knowledge, and offer flexibility in the client's level of involvement during realisation. Moreover, collaboration between client and contractor was thought to improve the anticipation of problems in later phases and to create stronger incentives for performance across the asset's life cycle (Chao-Duivis, 2019).

At the same time, experience with integrated and life-cycle contracts revealed persistent challenges related to uncertainty and risk allocation. At the moment of tendering, many project risks are still insufficiently understood, requiring contractors to price uncertainties far in advance (Rijkswaterstaat, 2020). This creates information asymmetries between clients and contractors and increases the likelihood of conservative pricing or strategic bidding behaviour. Beyond risk pricing, additional challenges concern scope definition, task demarcation, and the management of interdependencies between activities, particularly under the time pressure associated with competitive tendering (Chao-Duivis, 2019).

Although integrated and life-cycle delivery models reduce vertical fragmentation by combining multiple project phases, their limitations became increasingly apparent in practice. High levels of contractual rigidity, unbalanced risk allocation, and limited opportunities for open dialogue during early project stages often led to disputes and financial pressure for contractors. As a result, attention gradually shifted away from the contract form itself towards the timing and depth of market involvement.

3.2.4. Alliance and Other Collaborative Delivery Models

The construction sector has for some time also experimented with delivery models that aim to establish a high degree of collaboration between public clients and contractors. Alliance contracting is one such model, in which the client and one or more contractors jointly form a single project organisation. Within an alliance, risks, responsibilities, and rewards are shared, and decisions are made collectively under a no blame, no dispute principle (Koppenjan et al., 2020; PIANOo, n.d.-a).

Alliance contracting is characterised by open-book transparency and jointly agreed performance objectives, which are intended to align incentives towards overall project success rather than individual organisational interests (PIANOo, n.d.-a; Walker, 2015). According to Walker (2015), effective alliances depend on intensive collaboration, supported by co-location, shared information systems, and strong interpersonal trust. These characteristics make alliances particularly suitable for projects with high levels of complexity, uncertainty, or interdependence, where conventional contractual boundaries can hinder coordination (Koppenjan et al., 2020).

At the same time, alliance contracting places high demands on the participating organisations. It requires substantial trust, behavioural maturity, and cultural alignment between partners. When these conditions are not met, collaboration may deteriorate and responsibilities can become unclear (Walker, 2015; Koppenjan et al., 2020). In addition, the joint governance structure requires intensive coordination and significant investment in team development and relationship management, which makes alliance contracting relatively costly for the public client. As a result, this model is applied only selectively in practice and is generally considered most appropriate for projects in which risks can genuinely be shared and where the expected relational benefits outweigh the additional transaction costs (PIANOo, n.d.-a).

3.3. Two-phase Procurement Approach

Building on earlier efforts, Dutch public clients have increasingly explored ways to improve predictability and risk management. The water authorities were among the first to apply the two-phase procurement approach in the Netherlands. Because the financial scale of individual flood defence projects often equals or exceeds twice the annual budget of a water authority, these organisations had strong incentives to develop more financially predictable contracting approaches (Heemskerk et al., 2024). Following these developments, Rijkswaterstaat introduced the approach within the programme *On the Road to a Vital Infrastructure Sector* to promote more predictable and financially sustainable project delivery (Werkgroep 2-fasen aanpak, 2023).

The approach serves two main objectives: to use contractor expertise to reduce project risks and better identify opportunities, thereby improving cost predictability, controllability, and risk management for both public clients and the market, and to lower transaction costs by limiting redundant tender efforts in support of a financially healthy and productive construction sector (Werkgroep 2-fasen aanpak, 2023).

The approach divides procurement into two phases, separated by a formal Go/No-Go decision. During the Phase 1, the client and contractor jointly develop the design, identify and mitigate project risks, and work towards an execution price based on a provisional price established during tendering.

Phase 2 begins only when the predefined conditions have been met and a fixed price is agreed. If agreement cannot be reached, the client may return to the market and find another contractor to execute the work. To safeguard this competition, a waiting-room agreement (*Wachtkamerovereenkomst*) is sometimes concluded with the runner-up bidder, allowing the client to continue with an alternative contractor if the initial negotiation in Phase 1 does not lead to agreement (Werkgroep 2-fasen aanpak, 2023).

Importantly, this phased structure does not introduce a new project delivery model. Rather, the approach structures procurement in two steps within existing arrangements. The contractor is selected first, while the final execution price is agreed only after a preparatory phase. This staged structure can be embedded in different contractual and procedural configurations, depending on project scope, uncertainty, and the intended form of collaboration.

The most common configuration is a single UAV-GC contract that covers both phases, which suits a coordinated form of collaboration in which tasks are aligned while responsibilities remain distinct. Alternatively, a *bouwteamovereenkomst* can be used for Phase 1, followed by a UAV-GC contract for execution in Phase 2, supporting a more integrated form of collaboration (Fijneman and CROW, 2020). In programme-based settings, such as the Flood Protection Programme (*Hoogwaterbeschermingsprogramma*), framework or portfolio agreements are also applied, allowing multiple projects to pass through consecutive two-phase cycles under a single umbrella contract (Fijneman and CROW, 2020).

In addition to contractual form, the approach can be applied through different procurement procedures. For smaller or less complex projects, a restricted negotiated procedure (*meervoudig onderhandse procedure*) is often used. Larger or more complex projects may follow a national or European non-open procedure, while projects that require early interaction between client and market parties may use a competitive dialogue (*concurrentiegerichte dialoog*) to align expectations prior to contract award (Fijneman and CROW, 2020).

Across these different procedures, tenders in this approach typically place less emphasis on detailed technical solutions and more on qualitative criteria, such as the contractor's approach to collaboration, risk management, and cost transparency. By limiting the need for extensive technical elaboration at the tender stage, public clients aim to reduce the effort and costs incurred by contractors in preparing tenders, thereby contributing to lower transaction costs.

Once the contractor has been selected and Phase 1 starts, collaboration can take different forms. In a coordinated collaboration, tasks and responsibilities remain formally divided, with the public client leading the process. In an integrated collaboration, client and contractor act as a single project team with shared decision-making authority and joint responsibility for outcomes (Werkgroep 2-fasen aanpak, 2023).

Different price mechanisms can be applied. The most common is a provisional price refined throughout Phase 1 as the design develops and uncertainties are reduced. Another widely used form is the task-based budget (*Taakstellend budget*), which sets target budgets for both the planning (*TB-PLAN*) and realisation (*TB-REA*) phases. These budgets are reviewed and adjusted during the design process, ensuring joint cost control and transparency (Hoogwaterbeschermingsprogramma (HWBP) and Van Dijk, 2025). Other mechanisms include open-book cost-plus arrangements, General Costs, Profit and Risk percentages (*AKWR-percentages*), and qualitative price-control methods that evaluate how contractors manage cost transparency and budget adherence (Fijneman and CROW, 2020). The suitable model depends on project uncertainty: fixed or ceiling prices are used when scope and risk are well defined, while provisional or task-based pricing provides flexibility when uncertainties remain high.

Price formation follows a gradual process. The provisional price or task-based budget established during tendering is refined throughout Phase 1 as design information improves and risks are better understood. The final, market-conform price is determined only once sufficient certainty has been reached. In theory, this staged approach can reduce speculative bidding, spread transaction costs more evenly, and strengthen accountability, as cost development is continuously monitored through open-book accounting (Fijneman and CROW, 2020).

After agreement on design and price and a Go decision, the project enters Phase 2, which concerns execution and does not essentially differ from regular project delivery.

3.4. Conclusion — Pathway to the Two-Phase Procurement Approach

This section synthesises the findings of the preceding chapter and provides answers to the first sub-question: *Why was the two-phase procurement approach introduced in Dutch infrastructure procurement?*

The approach was introduced in response to persistent shortcomings in Dutch construction procurement that became apparent under both traditional and integrated delivery models. Traditional models were characterised by strong fragmentation between design and execution, which limited knowledge exchange and early risk identification. This frequently resulted in high failure costs arising from rework and poor coordination, while also contributing to delays and adversarial relations between public clients and contractors.

Integrated and life-cycle delivery models sought to overcome this fragmentation by combining multiple phases within a single contract. In practice, however, these models introduced new problems. Contractors were required to price substantial uncertainties at an early stage, which encouraged opportunistic behaviour and reinforced a “bid low, claim later” culture. At the same time, extensive and technically detailed tender procedures led to high transaction costs. Combined with increasing risk exposure and persistently low profit margins, these conditions reduced the willingness of contractors to participate in large and complex projects, as illustrated by the withdrawal of major contractors from high-value tenders and the limited market interest in flagship projects.

The approach can be understood as a response to these developments. By reducing the technical depth of tenders and placing greater emphasis on qualitative criteria, the approach seeks to lower bidding effort and transaction costs for contractors. By postponing definitive price formation until after a joint design and risk analysis phase, it aims to reduce the need for contractors to price uncertainties prematurely. At the same time, the formal Go/No-Go decision is intended to limit premature contractual lock-in by allowing both parties to withdraw if agreement cannot be reached. The possibility for the client to return to the market at this stage is designed to preserve a degree of competitive pressure and to constrain the market power of the selected contractor. Early contractor involvement during Phase 1 is intended to enable the use of construction expertise to identify and mitigate risks, while continuity between design and execution is expected to reduce fragmentation between project phases. Finally, the use of fixed General Costs, Profit and Risk percentages is designed to create more predictable commercial conditions, thereby potentially making participation more attractive for market parties.

4

Early Contractor Involvement: Benefits and Weaknesses

In this chapter, the literature on Early Contractor Involvement (ECI) is reviewed to describe how early involvement of contractors is understood in research and practice and which benefits and weaknesses are commonly associated with it. In doing so, the chapter addresses the second sub-question of this study: *What are the main expected benefits and weaknesses associated with the two-phase procurement approach in Dutch infrastructure projects?*

4.1. Early Contractor Involvement

The growing focus on collaboration and early market involvement has led to the emergence of several delivery models that embed elements of ECI. ECI introduces collaboration into conventional contract settings by involving the contractor early in the design phase to contribute practical construction knowledge and improve the feasibility of the design (Friedinger and Sander, 2024).

The rationale for ECI lies in addressing the fragmentation, adversarial relationships, and inefficiencies associated with traditional models where design and construction are strictly separated (Eadie and Graham, 2014; Song et al., 2009; Mohd Nawi et al., 2014). By engaging the contractor early in design development, ECI integrates construction expertise to mitigate these problems and reduce costly late-stage modifications and disputes (Laryea and Watermeyer, 2016).

In the international literature, ECI functions as an umbrella term for systems that introduce contractors in preconstruction (Hällström and Bosch-Sijtsema, 2019; Finnie and Smith, 2021). In the Netherlands, comparable forms include the *Bouwteam* and the *two-phase procurement approach*.

ECI is generally most effective in projects that are complex, large-scale, or high-risk (Friedinger and Sander, 2024; Eadie and Graham, 2014; Hällström and Bosch-Sijtsema, 2019; Finnie et al., 2019; Saunders et al., 2024). It is particularly valuable in projects requiring complex logistical planning, such as alterations to existing buildings, airports, hospitals, or busy road junctions where the costs of disruption would otherwise be considerable (Finnie and Smith, 2021; Finnie et al., 2019). Likewise, it offers advantages in projects with significant scope uncertainty, where traditional tender pricing would be inflated to cover unknowns. Public clients also turn to ECI when aiming to secure resources in a heated market, using negotiated open-book pricing to guarantee capacity. Finally, projects requiring high levels of technical expertise can particularly benefit from early contractor involvement (Friedinger and Sander, 2024; Ishtiaque, Wondimu, and Klakegg, 2025).

The literature review on ECI revealed a recurring set of themes that influence its effectiveness in practice (Table 4). These themes captured both the mechanisms through which early collaboration is expected to create value and the challenges that often emerge with this method. Eight interrelated themes can be distinguished: Capability, Collaboration, Culture, Innovation, Pricing, Risk Allocation, Transaction Costs and Value for Money. Each theme represents a dimension of how ECI alters the interaction between clients and contractors. The following sections discuss these themes in terms of their main benefits and weaknesses.

Table 4: Overview of Identified ECI Themes

Source title	Capability	Collaboration	Culture	Innovation	Pricing	Risk Allocation	Transaction Costs	Value for Money
Atkinson et al., 2023	✓	✓	✓	✓	✓	✓	✓	✓
Eadie and Graham, 2014	✓	✓	✓	✓	✓	✓	✓	✓
Finnie et al., 2019	✓	✓	✓	✓	✓	✓	✓	✓
Finnie and Smith, 2021	✓	✓	✓	×	✓	✓	✓	✓
Friedinger and Sander, 2024	✓	✓	✓	✓	✓	✓	✓	×
Hällström and Bosch-Sijtsema, 2019	✓	✓	×	×	✓	×	×	×
Ishtiaque, Malvik, et al., 2025	✓	✓	✓	✓	✓	✓	✓	×
Ishtiaque, Wondimu, and Klakegg, 2025	✓	✓	×	✓	✓	✓	×	✓
Ishtiaque, Wondimu, Memic, et al., 2025	✓	✓	×	✓	✓	✓	×	✓
Laryea and Watermeyer, 2016	✓	✓	✓	✓	✓	✓	✓	✓
Lenferink et al., 2012	✓	✓	✓	✓	✓	✓	✓	✓
Malvik et al., 2021	✓	✓	✓	✓	✓	✓	✓	✓
Rahman and Alhassan, 2012	✓	✓	✓	✓	✓	✓	✓	×
Saunders et al., 2024	✓	✓	×	×	✓	×	✓	✓
Sheamar et al., 2024	✓	✓	×	×	✓	×	✓	✓
Song et al., 2009	✓	✓	×	×	✓	✓	✓	×
Wondimu, Hosseini, et al., 2016	✓	✓	✓	×	✓	✓	×	×
Wondimu, Hailemichael, et al., 2016	✓	✓	✓	×	✓	✓	×	×

Capability

Capability refers to the skills, knowledge, and experience of individuals and organisations involved in a project. The theme focuses on how professional competence and organisational capacity influence decision-making, collaboration, and the overall quality of project delivery.

ECI leverages the technical knowledge and experience of contractors to improve buildability and planning (Song et al., 2009; Rahman and Alhassan, 2012). Contractors are viewed as essential sources of practical expertise and local knowledge (Laryea and Watermeyer, 2016). The rationale for ECI is often grounded in recognising that contractors possess specialist competence and equipment essential for execution, and that public owners may lack equivalent technical expertise (Wondimu, Hosseini, et al., 2016).

The approach enables better utilisation of individual skills and facilitates selection of the most suitable personnel for the project team (Finnie and Smith, 2021).

However, the client's capability is equally critical: successful ECI requires "intelligent clients" who can specify requirements and manage relationships effectively (Laryea and Watermeyer, 2016). The absence of technical expertise or experience with relational delivery models often undermines outcomes (Friedinger and Sander, 2024).

Collaboration

Collaboration in project delivery refers to the degree of joint working between clients, contractors, and consultants. It focuses on how parties share information, align goals, and make collective decisions to improve project outcomes and reduce conflict.

ECI fosters a collaborative environment, moving away from the adversarial "bid low, claim later" culture (Song et al., 2009; Eadie and Graham, 2014). It is widely regarded as a form of partnering aimed at developing long-term

relationships between project participants (Rahman and Alhassan, 2012). The involvement of the contractor in the early stages fosters cooperation throughout both the design and construction phases (Laryea and Watermeyer, 2016).

In practice, ECI frequently begins with a front-end partnering process in which the owner, consultant, and contractor establish common goals and expectations, fostering mutual understanding and early team cohesion (Wondimu, Hosseini, et al., 2016).

Trust, openness, and honest communication are highlighted as key relational benefits (Rahman and Alhassan, 2012; Wondimu, Hailemichael, et al., 2016). Improved collaboration is ranked among the most likely and most desired benefits of ECI from the client's perspective (Ishtiaque, Wondimu, and Klakegg, 2025; Ishtiaque, Wondimu, Memic, et al., 2025). Collaboration helps reduce conflict levels and encourages mutual understanding of interests from the outset (Ishtiaque, Malvik, et al., 2025). It also provides a fertile basis for innovation and creative problem-solving (Rahman and Alhassan, 2012).

Mechanisms such as Two-Stage ECI (2S-ECI) promote team integration and collaborative protocols that facilitate dialogue and collective decision-making (Finnie and Smith, 2021; Malvik et al., 2021). Transparency through open-book accounting and shared decision-making remains central to reducing disputes and clarifying expectations (Lenferink et al., 2012; Friedinger and Sander, 2024).

However, successful collaboration depends on willingness: clients must be open to genuine cooperation, and designers must be flexible enough to integrate contractor input (Lenferink et al., 2012). Persistent barriers include lack of integration and insufficient open communication, both of which hinder trust development (Rahman and Alhassan, 2012). Comparable findings in the UK show that embedding collaborative approaches in organisations remains difficult (Atkinson et al., 2023).

Culture

Culture refers to the shared norms, values, and behaviours that shape how stakerholders interact and make decisions. It focuses on how trust, openness, and mutual respect influence cooperation, communication, and the acceptance of collaborative working practices.

ECI requires a significant cultural shift within the construction industry (Laryea and Watermeyer, 2016). Traditional procurement breeds adversarial relationships, while ECI promotes relational collaboration and trust (Song et al., 2009; Rahman and Alhassan, 2012).

A collaborative culture demands mutual trust, willingness to compromise, and sustained commitment (Finnie and Smith, 2021). However, lack of client commitment and reluctance to share information remain persistent barriers (Rahman and Alhassan, 2012).

New Models of Construction Procurement advocate a "no-blame" and "pain/gain" culture to reinforce collaboration and accountability (Sheamar et al., 2024). Cultural resistance and institutional inertia, however, continue to impede the normalisation of ECI practices (Atkinson et al., 2023; Sheamar et al., 2024).

Innovation

Innovation refers to the ability of a project or organisation to develop and apply new ideas in design, materials, construction methods, or processes. It focuses on how early collaboration and knowledge sharing enable creative technical or organisational solutions that improve project outcomes, sustainability, or efficiency.

By involving contractors early, ECI enhances innovation and the exploration of alternative solutions (Song et al., 2009; Hällström and Bosch-Sijtsema, 2019; Ishtiaque, Wondimu, Memic, et al., 2025). It enables creative input in design, materials, and methods (Sheamar et al., 2024).

Innovation ranks among the three most likely benefits of ECI from the client's perspective (Ishtiaque, Wondimu, and Klakegg, 2025). However, clients often associate innovation with broader value creation rather than as a standalone outcome (Ishtiaque, Wondimu, Memic, et al., 2025).

Implementation depends heavily on client flexibility and willingness to accommodate new ideas (Ishtiaque, Malvik, et al., 2025). While innovation can improve sustainability and constructability, it may also introduce higher perceived risks and uncertainties for clients (Ishtiaque, Wondimu, Memic, et al., 2025).

Pricing

Pricing relates to how project costs are estimated, structured, and agreed between client and contractor. It focuses on cost transparency, open-book accounting, and the development of target or incentive-based price mechanisms that link payment to performance.

From a financial perspective, ECI enhances cost certainty and control. Early estimates and open-book approaches allow iterative refinement of budgets (Rahman and Alhassan, 2012; Sheamar et al., 2024). ECI uses contractor knowledge to ensure cost effectiveness (Laryea and Watermeyer, 2016) and often involves the joint development of a Target Price with a pain/gain share mechanism (Rahman and Alhassan, 2012).

Transparent pricing through open-book accounting helps achieve better cost control and reduce exposure to price fluctuations (Finnie and Smith, 2021; Finnie et al., 2019). ECI provides the client with early cost insight (Eadie and Graham, 2014") and improves cost predictability (Hällström and Bosch-Sijtsema, 2019).

Nevertheless, clients often perceive that cost reductions are among the least likely outcomes of ECI, even if value perception and control improve (Ishtiaque, Wondimu, and Klakegg, 2025). In practice, openness is conditional, as parties embrace transparency only when reasonable profit margins are secured (Eadie and Graham, 2014).

Risk Allocation

Risk allocation concerns the way financial and operational risks are identified, discussed, and distributed among project stakeholders.

Risk management is a fundamental driver for adopting ECI (Eadie and Graham, 2014). ECI enables early identification, discussion, and joint allocation of risks (Rahman and Alhassan, 2012; Eadie and Graham, 2014). Engaging contractors early promotes a better understanding of potential risks and reduces overall exposure (Rahman and Alhassan, 2012).

Effective risk management is among the most valued benefits for clients (Eadie and Graham, 2014). Workshops and joint sessions are often used during 2S-ECI to allocate risks equitably (Finnie and Smith, 2021).

It also depends on limiting project uncertainty before tendering; when uncertainty remains high, bidders may be discouraged or price risks excessively. Clients therefore play a important role in defining the project to an optimal level before engaging contractors (Wondimu, Hosseini, et al., 2016).

However, many challenges persist: standard contract forms are frequently amended to shift excessive risk to contractors, undermining ECI's collaborative intent (Finnie et al., 2019).

Ambiguity in roles and unclear allocation of responsibility remain significant obstacles (Rahman and Alhassan, 2012). Once contractors are engaged, clients may struggle to transfer newly emerging risks during preconstruction (Laryea and Watermeyer, 2016). Some studies note that, despite ECI's intent, 85 precent of respondents still believed clients paid a premium for risk in ECI projects (Eadie and Graham, 2014).

Transaction Costs

Transaction costs refer to the resources spent on preparing, tendering, negotiating, and managing contracts. The theme focuses on how procurement structure and collaboration influence the time, effort, and money required to reach and maintain agreements.

The procurement process under ECI can become protracted, extending design and tendering phases and raising transaction costs (Sheamar et al., 2024; Finnie and Smith, 2021). The extended preparatory stage demands considerable time and resources, which can offset efficiency gains.

However, ECI may also reduce administrative and legal costs by fostering trust and reducing the need for defensive documentation and litigation (Rahman and Alhassan, 2012). In the Netherlands, early start or "parallel" procedures under ECI were found to increase procedural costs and risks for both bidders and clients (Lenferink et al., 2012).

Tendering efficiency can improve through 2S-ECI, as clients and industry partners avoid unnecessary duplication of procurement costs (Finnie et al., 2019).

Value for Money

Value for Money represents the relationship between the quality and functionality of a project and the resources used to deliver it. The theme focuses on achieving optimal outcomes. Balancing cost, quality, risk, and long-term benefits, rather than simply minimising price.

Value for money is a key objective, particularly for public clients (Eadie and Graham, 2014). ECI aims to deliver the best overall value and optimal use of public resources (Rahman and Alhassan, 2012).

Value for Money is achieved through early integration of construction knowledge, value engineering, and collaborative cost control (Eadie and Graham, 2014; Laryea and Watermeyer, 2016). Value creation is understood as the ratio of net benefits to extra costs, combining tangible and intangible value aspects (Ishtiaque, Wondimu, Memic, et al., 2025).

In Dutch practice, ECI aligns with the Most Economically Advantageous Tender criterion, balancing price and quality (Lenferink et al., 2012). Yet, demonstrating Value for Money remains difficult in practice due to the intangible nature of benefits and limited measurability of the contractor's added value (Finnie et al., 2019).

4.2. Conclusion — Early Contractor Involvement

This section synthesises the findings of the preceding chapter and provides answers to the second sub-questions: *What are the main expected benefits and weaknesses associated with the two-phase procurement approach in Dutch infrastructure projects?*

The literature suggests that the two-phase procurement approach is expected to generate several benefits through the early involvement of contractors in the design phase. Anticipated advantages include improved buildability and planning through the early use of contractor expertise, stronger collaboration and trust between project parties, and greater transparency through open-book pricing. Early risk identification and discussion may lead to more balanced risk allocation and fewer post-award disputes. The staged and collaborative development of the price is expected to improve cost insight, cost predictability, and perceived fairness. In addition, the approach may reduce redundant tendering efforts, support value-for-money considerations, create space for innovation, and contribute to more relational forms of collaboration, including cultural shifts towards openness and shared responsibility.

At the same time, the literature highlights several weaknesses and uncertainties. The collaborative preparation phase is time- and capacity-intensive and may increase upfront transaction costs for both clients and contractors. Establishing a market-conform price remains complex, particularly under high uncertainty, and transparency in pricing is often conditional. Differences in risk perception and valuation may persist, undermining intended risk allocation. The expected benefits further depend on the capabilities and behaviour of the organisations involved; limited client capability, unclear roles, or insufficient willingness to collaborate can restrict outcomes. Innovation and value creation are not guaranteed and are often constrained by institutional rigidity and risk aversion.

PART II

Capturing Stakeholder Perspectives

5

Conducting the Q-methodology: From Statements to Factors

This chapter outlines the results of the Q-study used to explore how stakeholder in Dutch infrastructure projects perceive the two-phase procurement approach. The results of the first five steps are addressed: (1) Definition of the Concourse; (2) Development of the Q-set; (3) Selection of the P-set, and (4) Collecting Q-sorts and (5) Q-analysis. The remaining step, (6) interpretation, is presented in Chapter 6.

5.1. Step 1: Definition of the Concourse

Step 1 focused on collecting a broad and diverse set of statements for the concourse. The aim was to capture the range of opinions, claims, and viewpoints expressed about the two-phase procurement approach, and thereby reflect the discourse surrounding this approach. In line with Q-methodology, the emphasis was not on factual descriptions but on statements expressing subjective views and interpretations. Statements were collected from four different types of sources, each contributing a distinct layer of the broader discourse.

Statements were derived from published, peer-reviewed academic literature to ensure that the concourse reflected established theoretical and empirical insights. This included the ECI literature reviewed in Chapter 4, as well as Dutch studies on the two-phase procurement approach. Table 16 presents the 18 ECI literature sources used for deriving statements, and Table 15 presents the three Dutch sources on the two-phase procurement approach.

Policy and professional documents formed a second source for the concourse. These sources provided perspectives from public clients, industry organisations, legal practitioners, and construction practitioners, capturing how the two-phase procurement approach is discussed in practice.

The 18 sources listed in Table 18 include government guidance, sector handbooks, legal commentaries, consultancy analyses, and practitioner white papers.

Media and public discourse sources were included to ensure that the concourse also reflected how the two-phase procurement approach is discussed in sector-oriented journalism and other public-facing communication. These materials capture a more informal layer of the discourse, revealing how practitioners and commentators talk about the approach outside academic or institutional settings.

The seven sources listed in Table 17 consist of sector articles, commentary pieces, and podcasts.

In addition to written sources, a qualitative source was included. These statements were collected during a Community of Practice event organised by Rijkswaterstaat, in which both public-client and contractor representatives

participated (“Community of Practice Rijkswaterstaat tweefasenaanpak”, 2025). From this event, statements were extracted that reflected how stakeholders discussed their experiences and perspectives in an informal, discussion-based setting.

After the statements were collected, their relevance to the two-phase procurement approach was assessed. Statements considered insufficiently relevant were removed, leaving a total of 487 statements in the final concourse.

5.2. Step 2: Development of the Q-set

After defining the concourse, the next step was to reduce the full set of statements to a manageable Q-set. This step involved selecting a subset of statements that together represented the breadth of viewpoints present in the concourse, while avoiding unnecessary overlap.

To structure the selection process, the statements were organised according to the eight themes identified in the ECI literature (Chapter 4): Capability, Collaboration, Culture, Innovation, Pricing, Risk Allocation, Transaction Costs, and Value for Money.

All statements were assigned to one of these themes. Statements derived from grey literature were originally formulated in Dutch and were translated into English. To support comparability across statements, each statement was reformulated to begin with “*The two-phase procurement approach …*”, while preserving the original wording and meaning as closely as possible. The full thematic overview of the concourse with an analysis is presented in Appendix C.

The final Q-set was developed by selecting statements from each of the eight themes. As a guiding principle, approximately five statements were selected per theme to ensure balanced representation. For three themes, one additional statement was included because it captured a distinctive formulation or nuance not sufficiently reflected in the other statements.

During this selection process, statements were once again assessed for clarity and specificity. Each statement was checked to ensure that it expressed a single, clear proposition that could be positioned along a continuum of agreement or disagreement. Minor reformulations were made where necessary to improve clarity, while maintaining the original intent and terminology familiar to practitioners in the sector.

The final Q-set consisted of 43 statements, as presented in Table 5.

Table 5: Final Q set

Nr.	Statement	Source
Capability		
1.	Reduces design and scope changes during execution.	Ishtiaque, Wondimu, Memic, et al., 2025
2.	Is hindered because public clients lack sufficient knowledge to properly assess cost estimates.	Wondimu, Hailemichael, et al., 2016
3.	Fails to reach its full potential because public clients lack the capacity to (co-)design, safeguard quality and control costs.	Chao-Duivis, 2019
4.	Works less effectively because attitudes and behaviours do not change in practice.	Mobilis TBI, 2025
5.	Requires retaining knowledge within the project team to function well.	Van Belzen, 2024
Collaboration		
6.	Reduces disputes between parties.	Rahman and Alhassan, 2012
7.	Increases the satisfaction of both the public client and the contractor.	Rahman and Alhassan, 2012
8.	Builds trust between the public client and the contractor through cost transparency.	Sheamar et al., 2024
9.	Promotes long-term collaboration between the public client and the contractor.	Arends, Meer, et al., 2017
10.	Improves the project result at too high a project price.	"Community of Practice Rijkswaterstaat tweefasenaanpak", 2025
11.	Weakens the commitment of the public client and the contractor due to the presence of the Go/No-Go moment.	"Community of Practice Rijkswaterstaat tweefasenaanpak", 2025
Culture		
12.	Contributes to a healthier and more resilient construction sector.	Van Belzen, 2024
13.	Creates a more positive, motivating and safe project culture.	Van Belzen, 2024
14.	Rewards preventing mistakes rather than correcting them.	C. Jansen, 2019
15.	Continues to convey a strong us–them mentality.	Bosch, 2023
16.	Turns procurement into an overly short and selective "beauty contest".	Koenen, 2019
17.	Leads to collaboration training placing collaboration too strictly into roles and procedures.	Koenen, 2019
Innovation		
18.	Improves the practical buildability of the design.	Eadie and Graham, 2014
19.	Stimulates the use of innovative and sustainable construction methods.	Friedinger and Sander, 2024
20.	Breaks the belief that complexity can only be controlled through extensive contracts and strict requirements.	Heemskerk et al., 2024
21.	Delivers more cost-efficient design solutions.	HDP Consult, 2018
22.	Provides more innovative solutions due to the longer design phase.	Ministerie van Infrastructuur en Waterstaat, 2019
Pricing		
23.	Enables contractors to use enthusiasm about the design and schedule pressure to push for higher prices.	Fijneman and CROW, 2020
24.	Causes public clients to feel compelled to accept a price to avoid delays.	Fijneman and CROW, 2020
25.	Creates through the Go/No-Go moment a balanced incentive to achieve a joint outcome.	Heemskerk et al., 2024
26.	Accepts higher initial costs in exchange for fewer changes and claims during execution.	Designing Buildings, n.d.
27.	Conflicts in practice with the idea of "fair work for fair pay".	Bosch, 2023
28.	Provides a fair profit margin that aligns with the principle of "fair pay for fair work".	"Community of Practice Rijkswaterstaat tweefasenaanpak", 2025
Risk Allocation		
29.	Offsets higher initial costs with lower final costs.	Finnie and Smith, 2021
30.	Reduces the risk of cost and time overruns by allowing more time for risk assessment.	Chao-Duivis, 2019
31.	Gives the public client a strong degree of control over the project.	Bleeker and Den Houting, 2020
32.	Limits the financial risks for both parties.	Ministerie van Infrastructuur en Waterstaat, 2019
33.	Leads to less additional work.	Ministerie van Infrastructuur en Waterstaat, 2019
Transaction Costs		
34.	Involves too many decision-makers at an early stage.	Finnie et al., 2019
35.	Shortens the procurement period significantly compared with traditional procurement.	Dijkwerkers Werken Door, 2020
36.	Reduces procurement costs.	Dijkwerkers Werken Door, 2020
37.	Shortens the total project duration.	Dijkwerkers Werken Door, 2020

Nr.	Statement	Source
38.	Simplifies the procurement procedure compared with traditional integrated contract forms.	C. Jansen, 2019
Value for Money		
39.	Strengthens the focus on quality and long-term value instead of the lowest price.	Eadie and Graham, 2014
40.	Delivers higher client value.	Ishtiaque, Wondimu, Memic, et al., 2025
41.	Improves the overall quality of the project.	Rahman and Alhassan, 2012
42.	Rewards investing in phase 1 with a more robust phase-2 execution.	Mobilis TBI, 2025
43.	Makes investing in a single integrated public client–contractor team worthwhile.	Mobilis TBI, 2025

5.3. Step 3: Selection of the P-set

Step 3 concerns the selection of participants who performed the Q-sort. This group is referred to as the P-set. This study aimed for approximately 20 participants. In total, 27 participants were included in the final P-set.

Table 6 provides an overview of the selected participants. The group includes individuals with diverse professional backgrounds, including public clients, contractors, and participants who have worked on both sides of the market during their careers. The P-set therefore reflects a broad range of organisations involved in Dutch infrastructure projects, including Rijkswaterstaat, regional water authorities, engineering firms, dredging companies, contractors, cost consultancy firms, and legal professionals.

Participants fulfilled a variety of roles, such as project managers, contract managers, design managers, technical managers, cost experts, directors, and legal professionals. This functional diversity ensured that viewpoints were represented across managerial, technical, contractual, legal, and organisational domains.

Participants contributed experience from a wide range of projects. These include large infrastructure projects such as Zuidasdok, Krib- en Oeververlaging Pannerdensch Kanaal, and the A27 North and South improvements, as well as various underground infrastructure projects. Dike reinforcement programmes were also represented, including Meanderende Maas, Stadsdijken Zwolle, Wolferen–Sprok, Markermeerdijken, Dijkversterking Cuijk–Ravenstein, and Dijkversterking Streefkerk–Ameide–Fort Everdingen. In addition, renovation and replacement projects were included, such as the A12 IJsselbruggen, the A29 Heijenoordtunnel, the N99 Kooybrug and Draaibrug Montfoort, the A73 tunnels at Swalmen and Roertunnel, and the lock complexes at Heumen, Haringvliet, and Volkerak.

All participants had more than ten years of experience in the construction industry, and many had over 25 or even 35 years of experience. This level of experience enabled participants to reflect on the two-phase procurement approach in relation to previous contracting practices and longer-term sector developments.

Table 6: Selected P-set

Nr.	Role	Function	Experience
1.	Contractor / public client	Project and Contract Manager	25 years
2.	Contractor	Tender and Project Manager	>10 years
3.	Contractor	Project Manager	25 years
4.	Contractor / public client	Project and Technical Manager	>25 years
5.	Contractor	Legal Professional	>30 years
6.	Contractor / public client	Innovation Manager	20 years
7.	Public client	Contract Manager	>25 years
8.	Contractor	Project Manager	15 years
9.	Public client	Project Manager	25 years
10.	Contractor	Construction Manager	15 years
11.	Contractor	Project Manager	>10 years
12.	Contractor	Design Manager	20 years
13.	Contractor	Director	25 years
14.	Public client	Project Leader	30 years
15.	Contractor / public client	Contract Manager	20 years
16.	Public client	Contract Manager	>25 years
17.	Contractor	Cost Advisor	>35 years
18.	Public client	Technical Manager	25 years
19.	Contractor	Project Manager	25 years
20.	Contractor / public client	Project Manager	>40 years
21.	Public client	Project Manager	30 years
22.	Public client	Project Manager	>35 years
23.	Contractor	Director	>25 years
24.	Contractor	Project Manager	>20 years
25.	Contractor	Director	>30 years
26.	Public client	Cost Advisor	25 years
27.	Contractor	Project Manager	35 years

5.4. Step 4: Collecting Q-sorts

After the Q-set and P-set were established, the Q-sorts were collected. Each participant ranked the 43 statements according to the extent to which they recognised or agreed with them in relation to the two-phase procurement approach. As all participants were Dutch-speaking, the Q-sort was conducted in Dutch. The statements used in the Q-sort are presented in Table 27

The Q-sorting process consisted of two stages. First, participants performed a preliminary sort by dividing the statements into three groups: agree, neutral, and disagree. This step was used to familiarise participants with the statements. In the second stage, participants placed the statements into a fixed sorting scheme ranging from –4

(most disagree) to +4 (most agree).

All Q-sorts were conducted digitally via Microsoft Teams using the EQ Web Sort platform. Participants shared their screen during the session, allowing the researcher to provide guidance where needed and to ensure that the sorting procedure was followed consistently.

Immediately after completing the Q-sort, a short follow-up discussion was held in which participants explained their reasoning, particularly for statements placed at the extreme ends of the distribution. These explanations were used to support the interpretation of the factor analysis results.

5.5. Step 5: Q-analysis

After the Q-sorts were collected, the dataset was analysed using the KADE software package. In total, 27 Q-sorts were collected. Based on a preliminary screening of participant backgrounds, one Q-sort was excluded because the participant did not meet the inclusion criterion of having worked on a two-phase project in practice. The final analysis therefore included 26 Q-sorts.

5.5.1. Overview of Q-analysis Outcomes

The correlation matrix provides an overview of the similarities and differences between the 26 Q-sorts and forms the basis for factor extraction. The full correlation matrix is presented in Appendix D Table 29.

The correlations range from moderately negative to strongly positive (approximately –0.41 to +0.80), indicating substantial variation in how participants ranked the statements and supporting further factor analysis.

5.5.2. Factor Extraction

Factor extraction was used to identify groups of Q-sorts that correlate strongly with each other and represent shared viewpoints among participants. Principal Component Analysis (PCA) was applied to extract an initial set of factors.

Using the software's default settings, eight factors were extracted. This resulted in an unrotated factor loading matrix, in which each Q-sort loads on each factor (Appendix D Table 30). The eigenvalues and explained variance associated with these factors are presented in Table 7.

Table 7: Eigenvalues and Explained Variance from Principal Component Analysis

	1 Factor	2 Factors	3 Factors	4 Factors	5 Factors	6 Factors	7 Factors	8 Factors
Eigenvalue	11.6446	2.3732	1.5975	1.4908	1.1961	0.9850	0.9237	0.7241
Variance explained [%]	45	9	6	6	5	4	4	3
Cumulative variance explained [%]	45	54	60	66	71	75	79	82

As an initial screening step, the Kaiser–Guttman criterion of Eigenvalue (EV) > 1 was used to identify potentially relevant factor solutions. Table 7 shows the EV for the eight extracted factors. Applying the Kaiser–Guttman criterion would retain 1 Factor (EV = 11.6446), 2 Factors (EV = 2.3732), 3 Factors (EV = 1.5975), 4 Factors (EV = 1.4908) and 5 Factors (EV = 1.1961).

Although the 1 Factor solution meets the statistical requirements, its very high explained variance (45%) indicates that it represents a general consensus rather than a distinct viewpoint. Such general factors are common in Q-studies and typically do not provide a meaningful or interpretable perspective for further analysis (Watts and Stenner, 2012). For this reason, the 1 Factor solution was excluded from further analysis.

Analysing Factor Rotations

After factor extraction, a varimax rotation was applied to factor solutions containing two, three, four, and five factors. The detailed results for each solution are presented in Appendix E.

For each solution, a set of characteristics was examined, including the cumulative variance explained, the number and distribution of defining Q-sorts, inter-factor correlations, the number of distinguishing statements, and the occurrence of confounders and non-loaders. A comparative summary of these characteristics is provided in Table 8.

Table 8: Factor Determination Characteristics

	2 Factors	3 Factors	4 Factors	5 Factors
Cumulative variance explained [%]	54	60	66	71
Defining Q-sorts	23	24	19	16
Factors with 2 or more defining Q-sorts	2	3	4	4
Highest correlation	0.3991	0.3676	0.4028	0.4729
Lowest count of distinguishing statements	26	13	6	1
Number of confounders	6	4	11	13
Number of non-loaders	3	0	0	0

Table 8 shows clear differences between the solutions across these characteristics. The amount of variance explained increases from 54% in the 2-factor solution to 71% in the 5-factor solution, although the gains beyond three factors diminish. The number of defining Q-sorts peaks in the 3-factor solution (24) and declines in the 4- and 5-factor solutions, indicating weaker support for the additional factors. Although the number of factors with at least two defining Q-sorts increases in the 4- and 5-factor solutions, this coincides with other indicators of reduced clarity.

The highest inter-factor correlation is lowest in the 3-factor solution (0.3676), suggesting a clearer separation between factors than in the other solutions. The number of distinguishing statements also decreases sharply after three factors, dropping from 13 in the 3-factor solution to 6 and 1 in the 4- and 5-factor solutions. A similar pattern is observed for confounders: the 3-factor solution contains fewer confounders (4) than both the 2-factor solution (6) and the 4- and 5-factor solutions (11 and 13). Finally, only the 2-factor solution includes non-loaders, whereas all other solutions assign each respondent meaningfully to a factor.

Taken together, this comparison shows that the 3-factor solution best satisfies the predefined criteria. It offers an appropriate level of simplicity, avoiding unnecessary complexity while still capturing meaningful differences in viewpoints. In terms of clarity, it is characterised by the highest number of defining Q-sorts and a relatively low number of confounders. Distinctness is supported by the lowest inter-factor correlations and the highest number of distinguishing statements, indicating well-separated perspectives. Finally, the consistency in respondent loadings across rotations points to sufficient stability. On this basis, the 3-factor solution was selected for further interpretation.

Distribution of Respondents on the 3 Factor Solution

Table 9 presents the distribution of respondents across the three factors in the selected 3-factor solution. Respondents with a defining Q-sort are indicated in **bold** and marked with an **X**. Respondents 17 and 19 were not flagged as defining Q-sorts, because respondent 17 did not meet the 0.1 difference criterion and respondent 19 did not meet the communality requirement. Both respondents were therefore assigned to the factor on which they loaded highest, namely Factor 2.

This resulted in the following final distribution: 18 respondents loading on Factor 1, 6 on Factor 2, and 2 on Factor 3.

Table 9: Distribution Participants over Factors

Nr.	Role	Function	Experience	Factor 1	Factor 2	Factor 3
2.	Contractor	Tender and Project Manager	>10 years	**0.7712X**	0.3770	0.0458
3.	Contractor	Project Manager	25 years	**0.8368X**	0.0760	0.1798
5.	Contractor	Legal professional	>30 years	**0.7653X**	-0.0496	0.2525
7.	Public client	Contract Manager	>25 years	**0.7492X**	0.3768	0.3232
8.	Contractor	Project Manager	15 years	**0.8664X**	0.0755	0.0408
9.	Public client	Project Manager	25 years	**0.6685X**	0.1160	0.3547
10.	Contractor	Construction Manager	15 years	**0.7698X**	-0.0623	0.0804
11.	Contractor	Project Manager	>10 years	**0.8262X**	0.2039	0.1067
12.	Contractor	Design Manager	20 years	**0.6097X**	0.3337	0.2718
13.	Contractor	Director	25 years	**0.6513X**	0.1749	-0.1091
14.	Public client	Project Leader	30 years	**0.7447X**	0.1265	0.2607
15.	Contractor / public client	Contract Manager	20 years	**0.6749X**	-0.0047	-0.1059
18.	Public client	Technical Manager	25 years	**0.8148X**	0.0136	0.2568
20.	Contractor / public client	Project Manager	>40 years	**0.8275X**	-0.1659	0.2097
21.	Public client	Project Manager	30 years	**0.6657X**	-0.0626	0.1324
22.	Public client	Project Manager	>35 years	**0.5596X**	-0.1673	0.5323
24.	Contractor	Project Manager	>20 years	**0.6156X**	0.2250	0.1219
25.	Contractor	Director	>30 years	**0.6860X**	0.3022	0.4246
1.	Contractor / public client	Project and Contract Manager	25 years	0.0252	**0.7393X**	0.0105
4.	Contractor	Project and Technical Manager	>25 years	0.3780	**0.4647X**	-0.2324
17.	Contractor	Cost Advisor	>35 years	-0.3576	0.3977	0.3952
19.	Contractor	Project Manager	25 years	0.4190	0.4751	0.3414
23.	Contractor	Director	>25 years	0.2576	**0.7471X**	0.2355
26.	Public client	Cost Advisor	25 years	-0.3114	**0.4305X**	-0.0442
6.	Contractor / public client	Innovation Manager	20 years	0.0610	-0.0033	**0.8117X**
16.	Public client	Contract Manager	>25 years	0.3674	0.2171	**0.6131X**

No statistical testing was conducted to examine whether participant characteristics (role, function, or experience) were associated with factor membership. This was due to the number of defining participants in Factors 2 and 3 was too small to support meaningful inference .

5.5.3. Statistical Analysis of Statements

Table 39 in Appendix F presents the statistical results for all 43 statements. For each statement, the table reports the range, gap, average score, and standard deviation, providing insight into the degree of consensus and disagreement among participants.

A first notable pattern concerns statements that were placed across the full Q-sort range. In total, thirteen statements were ranked at both extremes (+4 and –4), resulting in the maximum possible gap of 8. This indicates strong disagreement, suggesting that participants held sharply opposing views on these statements. This polarisation is further reflected in the standard deviations: eleven statements have a standard deviation exceeding 2.0, confirming substantial dispersion in how these statements were evaluated. Most of these highly contested statements fall within the themes *Capability* and *Collaboration*.

In contrast, a smaller number of statements show clear signs of consensus. Two statements have the smallest observed gap of 4 and are accompanied by relatively low standard deviations. Overall, seven statements have a standard deviation below 1.45, indicating relatively stable and shared evaluations among participants. Several of these statements belong to the theme *Value for Money*, which appears to be associated with a higher degree of agreement compared to the other themes.

5.5.4. Factor Statement Rankings

Table 10 presents the statements together with their rankings in the composite Q-sort for each of the three factors. These rankings indicate how strongly statements are endorsed or rejected within each factor.

In the table, rankings are shaded cyan when a statement is identified as distinguishing for a particular factor. Statements shown in **bold** indicate consensus statements. Consensus statements reflect areas in which participants associated with different factors express broadly similar evaluations, despite differences in their overall perspectives. The identification of distinguishing and consensus statements is based on statistically significant differences in the underlying factor scores.

Across the three factors, the number of distinguishing statements differs. Factor 1 is characterised by 17 distinguishing statements, while Factor 2 has 13 and Factor 3 has 14 distinguishing statements. In addition, 11 statements are identified as consensus statements. The substantive interpretation of these rankings is presented in Step 6.

Table 10: Factors with Corresponding Rankings

Nr.	Statement	Factor 1	Factor 2	Factor 3
Capability				
1.	Reduces design and scope changes during execution.	+3	+3	+4
2.	Is hindered because public clients lack sufficient knowledge to properly assess cost estimates.	-2	+4	+2
3.	Fails to reach its full potential because public clients lack the capacity to (co-)design, safeguard quality and control costs.	-2	+4	-4
4.	Works less effectively because attitudes and behaviours do not change in practice.	-2	0	-1
5.	Requires retaining knowledge within the project team to function well.	0	+2	+4
Collaboration				
6.	Reduces disputes between parties.	+2	+1	-1
7.	Increases the satisfaction of both the public client and the contractor.	+2	0	+1
8.	Builds trust between the public client and the contractor through cost transparency.	+3	-2	-1
9.	**Promotes long-term collaboration between the public client and the contractor.**	**+1**	**+1**	**+1**
10.	Improves the project result at too high a project price.	-4	0	-2
11.	Weakens the commitment of the public client and the contractor due to the presence of the Go/No-Go moment.	-4	-3	-1
Culture				
12.	Contributes to a healthier and more resilient construction sector.	+2	+2	0
13.	Creates a more positive, motivating and safe project culture.	+1	-1	+3
14.	**Rewards preventing mistakes rather than correcting them.**	**0**	**+2**	**-1**
15.	Continues to convey a strong us–them mentality.	-3	+1	0
16.	Turns procurement into an overly short and selective “beauty contest”.	-3	-1	0
17.	**Leads to collaboration training placing collaboration too strictly into roles and procedures.**	**-2**	**-2**	**-2**
Innovation				
18.	Improves the practical buildability of the design.	+4	+1	+4
19.	Stimulates the use of innovative and sustainable construction methods.	-1	-4	+1
20.	**Breaks the belief that complexity can only be controlled through extensive contracts and strict requirements.**	**+1**	**0**	**+1**
21.	Delivers more cost-efficient design solutions.	0	-4	0
22.	Provides more innovative solutions due to the longer design phase.	-1	-3	+3
Pricing				
23.	Enables contractors to use enthusiasm about the design and schedule pressure to push for higher prices.	-3	-1	-1
24.	Causes public clients to feel compelled to accept a price to avoid delays.	-3	+2	+2
25.	**Creates through the Go/No-Go moment a balanced incentive to achieve a joint outcome.**	**0**	**0**	**+2**
26.	Accepts higher initial costs in exchange for fewer changes and claims during execution.	+1	+3	+1
27.	**Conflicts in practice with the idea of “fair work for fair pay”.**	**-4**	**-3**	**-3**
28.	Provides a fair profit margin that aligns with the principle of “fair pay for fair work”.	+2	+3	-2

Nr.	Statement	Factor 1	Factor 2	Factor 3
Risk Allocation				
29.	Offsets higher initial costs with lower final costs.	0	-1	-3
30.	Reduces the risk of cost and time overruns by allowing more time for risk assessment.	+3	+4	0
31.	Gives the public client a strong degree of control over the project.	0	+1	-2
32.	Limits the financial risks for both parties.	+4	-2	-3
33.	**Leads to less additional work.**	+1	0	0
Transaction Costs				
34.	**Involves too many decision-makers at an early stage.**	**-2**	**-3**	**-3**
35.	Shortens the procurement period significantly compared with traditional procurement.	-1	+1	-4
36.	**Reduces procurement costs.**	**-1**	**-1**	**-2**
37.	Shortens the total project duration.	-1	-4	+1
38.	Simplifies the procurement procedure compared with traditional integrated contract forms.	-1	-2	-4
Value for Money				
39.	**Strengthens the focus on quality and long-term value instead of the lowest price.**	**+3**	**+3**	**+3**
40.	Delivers higher client value.	+1	-1	0
41.	Improves the overall quality of the project.	+2	0	+2
42.	**Rewards investing in Phase 1 with a more robust Phase 2 execution.**	**+4**	**+2**	**+3**
43.	Makes investing in a single integrated public client–contractor team worthwhile.	0	-2	+2

6

Interpreting Stakeholder Perspectives: From Factors to Perspectives

This chapter presents the results of the final step of the Q-methodology: Step 6, interpretation. Building on the factor solution identified in Chapter 5, this chapter translates the factors into stakeholder perspectives on the two-phase procurement approach. By combining the composite Q-sorts with participants' qualitative explanations, the chapter analyses how stakeholders understand, evaluate and give meaning to key characteristics of the approach in practice. In doing so, this chapter addresses the final two sub-questions of the study: *How do stakeholders perceive and interpret the two-phase procurement approach in practice?* and *To what extent do stakeholder perspectives on the two-phase procurement approach converge or diverge?*

6.1. Summary of the Three Perspectives

Figure 6 provides an overview of the three perspectives identified in this study and the areas in which these perspectives converge. The detailed grids for each perspective are presented in Appendix G. The central overlap represents the broad agreement on the core functioning of the two-phase procurement approach. Across perspectives, the approach is associated with improved collaboration and better continuity between design and execution through early involvement of execution knowledge, leading to a more predictable execution phase. Risks and uncertainties are thoroughly explored in Phase 1, resulting in higher upfront costs but greater price stability during execution. Rather than lowering procurement costs overall, the approach is understood to redistribute them from unpaid tendering to a paid preparatory phase. The Go/No-Go moment is recognised as a structuring milestone, while contractor remuneration is generally perceived as higher and more predictable.

Perspective 1 places its emphasis on collaboration within the approach, with transparency as the key mechanism for building trust, shared responsibility and effective risk control. Open-book pricing and joint risk exploration are valued as ways to overcome us–them dynamics and adversarial relations. It is emphasised that procurement process are shifting from document-based towards behaviour-based assessment .

Perspective 2 takes a more critical stance towards the two-phase procurement approach, emphasising the limited countervailing knowledge and capacity of public clients. From this perspective, transparency and shared responsibility only generate benefits when the client is sufficiently capable of properly assessing costs, risks, and design choices. Although thorough risk exploration in Phase 1 is valued for improving predictability, this perspective emphasises that this often comes at the expense of faster delivery, cost-efficient design, and innovation. Risk reduction is primarily

understood as improved preparation through extensive risk exploration, rather than as risk redistribution between client and contractor.

Perspective 3 places its emphasis on execution stability and knowledge continuity, valuing early involvement of execution expertise as a means to reduce changes during construction. This perspective frames the approach as a trade-off, accepting higher upfront costs, limited competitive pressure and a Go/No-Go moment with limited practical leverage in exchange for a more stable and predictable execution phase, provided that the public client has sufficient capability to steer the process and safeguard cost and quality interests. At the same time, the two-phase approach is not perceived as simplifying or shortening the procurement process, as the stronger emphasis on quality, collaboration, and process assessment increases procedural complexity rather than reducing it.

Figure 6: Venn Diagram of the Perspectives

6.2. Consensus Statements

In this study, a total of eleven consensus statements were identified. These statements are relatively evenly distributed across the different themes, with most themes containing one or two consensus statements. The only exception is the theme *Capability*, for which no consensus statements were identified.

The statements listed in Table 11 form the set of consensus statements with their score in each of the three perspectives. These consensus statements are subsequently discussed along the main threads identified in the analysis.

Table 11: Overview Consensus Statements

Nr.	Statement	Persp. 1	Persp. 2	Persp. 3
9.	Promotes long-term collaboration between the public client and the contractor.	+1	+1	+1
14.	Rewards preventing mistakes rather than correcting them.	0	+2	-1
17.	Leads to collaboration training placing collaboration too strictly into roles and procedures.	-2	-2	-2
20.	Breaks the belief that complexity can only be controlled through extensive contracts and strict requirements.	+1	0	+1
25.	Creates through the Go/No-Go moment a balanced incentive to achieve a joint outcome.	0	0	+2
27.	Conflicts in practice with the idea of “fair work for fair pay”.	-4	-3	-3
33.	Leads to less additional work.	+1	0	0
34.	Involves too many decision-makers at an early stage.	-2	-3	-3
36.	Reduces procurement costs.	-1	-1	-2
39.	Strengthens the focus on quality and long-term value instead of the lowest price.	+3	+3	+3
42.	Rewards investing in Phase 1 with a more robust Phase 2 execution.	+4	+2	+3

Improved Collaboration and Continuity Across Phases

Early contractor involvement within the approach is associated with a range of benefits. As the same contractor remains involved throughout both the design and construction phases, knowledge and relationships are carried forward rather than transferred. *“Individuals changed, but the organisations involved remained the same”* (Participant 9). As a result, actors are less frequently required to work with decisions made by other organisations without understanding their underlying reasoning. In addition, continuity was reinforced by the sustained involvement of key figures. Although personnel changes could not be avoided, *“some key figures remained involved in the project from the beginning, which provided calm and stability”* (Participant 9).

From a relational perspective, the relationship between client and contractor at project level was perceived to have improved. It was noted that *“strong bonds between the teams involved”* (Participant 18) and that *“everyone would have liked to continue working together in the same composition”* (Participant 18). *“The contract itself does not determine everything; the way of working together does. In contrast to traditional contracts, where legal frameworks are sometimes experienced as restrictive, the two-phase approach offers room for trust and a shared focus on delivering a good project”* (Participant 15). *“This way of working made the project attractive to staff, with people actively seeking involvement because they experienced it as a positive working environment. Younger professionals and*

trainees even indicated that they would prefer to work exclusively on two-phase projects, citing the collaborative and open atmosphere, rather than on projects governed by what they described as 'strangling contracts'" (Participant 20).

Early involvement Leads to a More Predictable Execution

Early involvement of the contractor and other actors allows design- and cost-related choices to be discussed at a stage when execution knowledge can still be meaningfully incorporated. This involvement was consistently described as improving foresight in the early stages, as *"surprises later in the process are reduced"* (Participant 1). Rather than constraining decision-making, early engagement was seen as an approach that *"helps to keep the project deliverable and prevents unnecessary constraints from emerging later during execution"* (Participant 25), thereby *"strengthening decision-making by making uncertainties manageable"* (Participant 9).

This predictability is attributed to the depth of exploration and joint design work carried out in Phase 1. By investing more time and effort upfront, risks and uncertainties are identified and addressed collectively, which *"directly lead to a more stable execution"* (Participant 4). When risks are clarified in advance, *"there are fewer surprises during execution"* (Participant 7), and *"mistakes are identified at an early stage — or avoided altogether"* (Participant 21).

An important consequence is that key discussions are shifted forward in time. Instead of emerging during execution, *"discussions take place during the design phase rather than during execution"* (Participant 14). This results in *"a plan that clearly sets out what needs to be done and how it should be carried out, thereby minimising unexpected situations during execution"* (Participant 11), *"fewer discussions"* (Participant 21), and *"less improvisation"* (Participant 14). Ultimately, *"the better phase one is executed, the more robust the subsequent execution will be"* (Participant 24).

Rising Costs in Phase 1 and Price Stability in Phase 2

It is acknowledged that the two-phase approach entails higher costs in Phase 1, because involving contractors at this stage is more expensive, additional investigations are undertaken, and a more robust design is developed. These costs were not framed as inefficiencies, but as deliberate investments intended to stabilise Phase 2. *"Those who invest more in preparation during phase one prevent costly standstills later"* (Participant 4).

Early investment was associated with improved control over project uncertainty. Through additional investigations and early mitigation measures, *"uncertainties were limited and the project remained manageable. It required investment, but it worked: the project proceeded according to plan and risks remained under control"* (Participant 9). By jointly exploring risks and aligning expectations upfront, *"costly failure costs and delays are prevented"* (Participant 13). As a result, higher expenditure in the early phases was understood to contribute to more stable outcomes during execution, as *"the bandwidth in project results becomes smaller. Large positive and negative outliers disappear"* (Participant 25).

Not Lower Procurement Costs, but Other Distribution

There was also agreement that the approach does not always lead to overall lower procurement costs. It was emphasised that *"the tender may appear shorter, but the preparation is more intensive and more expensive. In net terms, the societal costs remain the same; only the distribution changes"* (Participant 17). This redistribution primarily concerns the shift of effort from unpaid tender work to a paid first phase, as *"the contractor incurs fewer costs in the bidding phase, but those same hours … are later paid for by the client in phase one"* (Participant 17). And *"tendering remains expensive and time-consuming, because everyone wants to win and internal quality processes within construction companies require substantial capacity"* (Participant 4).

The Go/No-Go Moment: a Milestone

There is shared agreement that the Go/No-Go moment functions as a structuring decision point. It creates a common focus for both the public client and the contractor, as *"it formed a concrete milestone that both parties worked towards"* and *"the agreement to work towards a joint decision point provided direction and coherence"* (Participant 14).

The presence of this explicit decision point plays a disciplining role in Phase 1. By providing a fixed endpoint, the Go/No-Go moment keeps the joint design process focused and prevents it from becoming *"bogged down"* in ongoing discussions about additional work and costs (Participant 14). Temporarily making price subordinate to substantive development enables parties to concentrate on completing the design, while the decision moment itself functions as *"a safeguard"* (Participant 14).

More Predictable Remuneration for Contractors

Across participants, there was broad agreement that contractors are well remunerated within this approach and that profit margins become more predictable as a result of the transparency around costs and risks. This predictability was widely associated with the principle of fair work for fair pay. On the contrary, the approach was consistently described as involving a high degree of transparency regarding costs, risk and profit, which was seen as distinctive compared to more traditional procurement methods. This openness was experienced as unusual, as *"in decades he had never spoken so openly about profit with a client"* (Participant 18), while at the same time *"there is openness about what constitutes a healthy profit for the contractor"* (Participant 18).

Transparency was not limited to profit margins, but extended to hourly rates and overall cost development. It was emphasised that *"the rates correspond well with the internal cost prices and are not set too low. There is therefore no question of squeezing margins or unreasonable arrangements"* (Participant 11). Cost formation was described as a joint and carefully scrutinised process, in which *"the price is established jointly and assessed critically"* and *"mirror quotations are requested to verify whether amounts are in line with the market"* (Participant 21). This was further supported by the fact that *"an independent cost table reviews and assesses the estimate in full"* (Participant 21).

6.3. Perspective 1: Transparency as a Basis for Predictability

A perspective in which the two-phase procurement approach enables predictable outcomes through reciprocal transparency and trust.

Table 12 presents the characterising statements for Perspective 1, showing their position in the composite Q-sort (Q-SV) and corresponding Z-scores, where Z-scores are statistically significant at the 5% level by default and at the 1% level when marked with an asterisk (*), indicating statements that most strongly define this perspective.

Table 12: Characterising Statements of Perspective 1

Nr.	Statement	Q-SV	Z-score
32.	Limits the financial risks for both parties.	(+4)	1.47*
30.	Reduces the risk of cost and time overruns by allowing more time for risk assessment.	(+3)	1.03
8.	Builds trust between the public client and the contractor through cost transparency.	(+3)	1.03*
16.	Turns procurement into an overly short and selective "beauty contest".	(-3)	-1.32*
23.	Enables contractors to use enthusiasm about the design and schedule pressure to push for higher prices.	(-3)	-1.56*
15.	Continues to convey a strong us–them mentality.	(-3)	-1.57*
24.	Causes public clients to feel compelled to accept a price to avoid delays.	(-3)	-1.59*
10.	Improves the project result at too high a project price.	(-4)	-1.62*

** Characterising statement at P<0.01*

Transparency as a Mechanism for Trust and Control

Within this perspective, collaboration is rooted in transparency, as *"by jointly going through the financial considerations, greater understanding arises between client and contractor"* (Participant 8). Costs transparency was repeatedly highlighted as *"one of the most important pillars for mutual trust within the two-phase approach"* (Participant 5) and as *"an important principle in this approach"* (Participant 13). *"This openness created trust and mutual respect"* and ensured that *"there was no feeling that one party was trying to disadvantage or outdo the other"* (Participant 14).

However, it is *"important that transparency is reciprocal"* (Participant 5). This was described in concrete terms, where *"all budgets were open, both those of the contractor and those of the water authority"* (Participant 20).

Such reciprocal openness was associated with observable changes in collaborative behaviour. It was noted that under these conditions *"people naturally show commitment"*, contributing to a working atmosphere in which *"they enjoy the work, take pleasure in it, and come up with good ideas"* (Participant 20). Within this setting, the open-book principle enabled collective decision-making, as it *"makes it possible to take decisions together that are 'best for the project', rather than for the individual organisation"* (Participant 5).

Transparency was seen as something that must be actively organised and facilitated. Participants described structured cost tables in which *"experts from both sides and independent advisers jointly review the cost structure"* (Participant 5). In these settings, *"estimates are discussed with cost experts on the client's side"*, after which *"the contractor must substantiate and explain these"* (Participant 10). When information was insufficient, *"additional consultation is held or further data are gathered"*, resulting in *"a continuous process of review and improvement"* (Participant 10). This applied to both parties, as *"everything was accessible and transparent, and this applied to both sides"* (Participant 9), with *"all quotations and adjustments openly shared"* (Participant 15).

This way of working ensured that *"everything was explainable and verifiable"* and *"every step was traceable and checked multiple times"* (Participant 9), which supported confidence at board and decision-making level. At the same time, it created *"space for a more honest dialogue about costs, risks and measures"* (Participant 13).

"This transparency does, however, require trust, and that trust is not yet self-evident within the sector" (Participant 13). When openness resulted in overly detailed discussions, collaboration could deteriorate, as *"the collaboration should not get bogged down in discussions about trivial details"* (Participant 22). In such cases, *"trust between the parties has been lost — and it is precisely that trust that is the core of this way of working"* (Participant 22). Others similarly observed that *"openness about costs can also lead to problems, such as additional discussions or a tendency towards micromanagement"* (Participant 24).

To mitigate this risk, participants described alternative decision-making practices. One approach involved working on consent rather than consensus, where *"a production team made a proposal and the others only assessed whether they had overriding objections"*, allowing focus to remain on the overall project, while the cost table assessed feasibility separately (Participant 20).

Ultimately, participants emphasised that the effects of transparency depend on how it is handled in practice. *"Whether transparency builds trust or creates tension depends on how carefully that information is handled"* (Participant 24). In some cases, achieving this required changes in team composition, after which *"trust was quickly restored and an open working method emerged in which everything could be discussed"* (Participant 14).

Overcoming Us–them Dynamics Through Shared Responsibility

"The collaboration is not experienced as divided, but it does require time and effort to make it work well" (Participant 7). Once established, the project was described as being centred on shared objectives, with parties *"working as one team on a single task"* (Participant 14).

At the same time, it was acknowledged that this way of working does not come naturally to everyone. In both organisations, there were individuals who struggled to embrace the principles of the two-phase approach, which led to tension and uncertainty during the initial phase. As one participant noted, *"people were still searching for how the*

collaboration should take shape", and *"in the first year, this even led to changes in personnel"* (Participant 7).

Due to these challenges, *"support and commitment from management"* was seen as essential, and it was stressed that *"leadership from above is required to push through when traditional attitudes and behaviours undermine the co-operation"* (Participant 7). Without such backing, established routines and scepticism could easily resurface.

The approach was described as a broader cultural shift, involving a move *"from excessive distrust to collaboration, from settling on price to jointly managing quality, risk and knowledge"*. This shift was seen as affecting not only the operational level but *"the entire organisational chain"*. Trust was described as functioning only when it is consistently supported *"from the work floor to the managerial tiers"* (Participant 13).

Where this cultural shift succeeds, it was observed that traditional boundaries fade naturally. As one participant explained, *"the two-phase approach requires a different attitude, in which openness, trust and shared responsibility are central"*, and *"where that succeeds, the us-and-them thinking disappears naturally"* (Participant 7).

From the outside, the collaboration may sometimes still appear divided, which was regarded as problematic, as *"it is not intended and does not reflect how collaboration actually takes place"* (Participant 8). The presence of us-them language within a project was described as a clear warning sign, as *"if it does occur, there is something fundamentally wrong in the collaboration"* (Participant 15). When people continue to speak in terms of *"we" and "they"*, *"there is no two-phase approach in place"* (Participant 21). For the approach to function properly, *"the parties [must] sit at one table without distinction between client, engineering consultancy and contractor"*, since once *"parties start pointing at one another again, the essence of the two-phase approach has disappeared"* (Participant 21).

Pricing as a Joint and Verifiable Process

The idea that pricing in the two-phase approach is driven by pressure or strategic behaviour is explicitly rejected. *"The assumption that contractors deliberately 'force' prices does not fit with the collaborative practice"* (Participant 3). Although the absence of direct competition and the presence of a Go/No-Go decision moment could, in theory, create conditions for time pressure that a contractor might exploit, this was not recognised in practice. Instead, *"pricing can always be verified through quality assurance and cost checks by the client"* (Participant 3).

The risk does not lie in opportunistic behaviour. *"The risk lies rather in too much enthusiasm within the team, leading to overly optimistic cost estimates"*, while stressing that this can be addressed through *"good quality control and clear agreements"* (Participant 3). Similarly, the notion that contractors would misuse their negotiating position was described as *"a perverse incentive"* that does not occur in *"well-structured collaborations"* (Participant 5). Such scenarios were considered conceivable only when *"the collaboration is structurally dysfunctional or insufficiently professionally guided"* (Participant 5).

This requires a deliberately designed procedure, in which *"transparency, shared objectives and control mechanisms exclude perverse incentives"* (Participant 5). If the collaboration was *"entirely based on trust and openness"*, it lead to *"mutual understanding of the circumstances"* rather than pressure or opportunism (Participant 14).

The idea that clients are forced into accepting prices was also strongly contested. Participants stated that *"no situation arises in practice in which public clients are pressured into accepting a price"* (Participant 3), and that *"as a client, you are not acting wisely if you allow yourself to feel forced into accepting a price"* (Participant 20). Rather, the approach was said to function only when *"the public client organises the process properly and sets the right tone from the start"* (Participant 20).

Time was acknowledged as a factor, but not as a source of pricing pressure. *"When there is doubt, more time is taken rather than hasty decisions"*, and any delay is mainly related to administrative decision-making rather than market pressure. The idea of a public client being placed in a *"victim role"* was explicitly rejected (Participant 3). This was illustrated by cases where *"both parties decided not to give immediate approval, but to take the time to calculate optimisations and opportunities"* when estimates proved higher than expected (Participant 8).

Pricing was consistently described as an incremental process. *"The price is not something that suddenly appears*

at the end; it is something you build up step by step" through ongoing involvement of cost experts and cost tables (Participant 20). *"Each quarter, an update is produced based on the latest information"*, ensuring that pricing does not culminate in *"a single negotiation moment at the end of the phase"*. In this process, *"the cost expert plays a key role"*, ensuring that the price is determined by *"substantive justification and joint agreement"* rather than time pressure (Participant 10).

It was further stressed that proper scheduling prevents pricing pressure, as *"with sufficient margin between the end of the preparation phase and the start of execution, no time pressure arises"* (Participant 11). Active client involvement was seen as essential, since *"if you lie on your back and simply wait for things to come your way, you are not doing it properly"* (Participant 20).

"The project costs are not regarded as too high, provided that there is an acceptable risk profile and a balanced division of responsibilities" (Participant 2). More broadly, it was emphasised that *"the approach does not lead to excessively high prices, but to fair and transparent price formation"* (Participant 11), resulting in *"market-conform results"* rather than overpayment (Participant 22). This was supported by the presence of *"strong checks and balances"* (Participant 20) and the use of *"a cost book … determined under competitive conditions"* (Participant 22).

Finally, *"overall profitability does not suddenly increase; rather, the result becomes more consistent"* (Participant 25). Failure costs were attributed to early decisions rather than to the approach itself, since *"failure costs arise from decisions made in the preparatory phase, not from the two-phase approach"* (Participant 25). While it was acknowledged that *"budgets in phase one are often inaccurate and therefore quickly exceeded"* (Participant 24), it was stressed that this does not represent a *"carte blanche"* for contractors. If costs exceed the agreed budget, *"the contractor shares in the pain"* (Participant 5).

What was observed instead is that the two-phase approach can reinforce cautious behaviour, as *"teams want to carry out as many investigations as possible and cover all risks"*, which *"leads to higher prices, but is unrelated to enthusiasm or time pressure"* (Participant 24).

Reducing Risk Through Early Joint Exploration

Within this perspective, risk allocation is also a important in the two-phase approach. Risk assessment and budgeting are *"among the most complex components of project preparation"*, while simultaneously being *"the key to preventing overruns"* (Participant 12). The approach was therefore characterised as something that *"significantly reduces the risk profile"* (Participant 2) and as *"one of the main objectives and strengths of this approach"*, with *"financial setbacks [being] limited for both sides"* (Participant 3).

This reduction of risk was seen as a logical consequence of the first phase, in which there is *"more time to exchange information and to discuss risks carefully"* (Participant 12). The approach limits risks because *"these are jointly investigated and developed in the first phase"*. Importantly, this was not restricted to financial risks alone, but also included *"the buildability and permit feasibility of the project"* (Participant 15).

Early and open knowledge sharing plays also a key role in this process. From the outset, *"client and contractor share knowledge, experience and insights about the risks that may occur and about lessons previously learned"*. Through this openness, it becomes possible to *"assess risks more accurately, link them to realistic mitigation measures and allocate the appropriate budgets"* (Participant 12). When uncertainties are identified, *"additional investigations can be carried out and risks can be allocated consciously"*, which helps to ensure that unforeseen circumstances do not escalate into conflict later in the project (Participant 13).

This perspective also contrasts the approach with more traditional contracting practices. Under the previous approaches, *"a contractor might still think: I will take on the work and earn money later through variations"*, whereas *"that is not the case here"*. Instead, *"the revenue model is based on delivering the plan within the agreed margin"*, with a focus on stability rather than profit from changes (Participant 8). In addition, *"a joint risk fund is also created for unforeseen circumstances"* (Participant 10).

"Although this method initially appears to create more uncertainty for the client, in practice it actually leads to greater control over the overall risk profile", resulting in *"fewer overruns in time and cost"* (Participant 5). At the same time, it was observed that *"the two-phase approach reinforces risk-averse behaviour"*, as *"teams want to carry out as many investigations as possible and cover all risks"* (Participant 24).

From Document-based Selection to Behaviour-based Assessment

Within this perspective, the characterisation of procurement as an overly short or selective "beauty contest" is explicitly rejected. It was explained that the tender phase builds on substantial pre-selection, as in the selection phase *"clients already impose substantial substantive minimum requirements"*, allowing only parties that meet these criteria to participate. As a result, *"technical capacity does not need to be reassessed in the tender phase"* (Participant 25). Such assessment practices were noted to be increasingly common and to *"provide useful information in practice"* (Participant 25).

Against this background, the procurement process was described as *"a process involving many discussions and substantive exchanges"*. Rather than focusing on polished documents, effort during procurement was described as being *"spent on understanding the task instead of writing polished narratives"* (Participant 2).

Although the procedure may appear selective, *"the competencies of the team carried significant weight in the assessment"*, which did not make the process *"a 'beauty contest'"*. Instead, *"the emphasis was not on presentation or appearance, but on collaboration, quality and the suitability of the team"* (Participant 9). The focus lies *"less on developing fully detailed plans or products and more on collaboration"* (Participant 21).

This shift was associated with lower transaction costs for contractors.This approach *"saves time and money"*, because *"contractors need to invest less in the tender stage"*. *"The greatest benefit is on the contractor's side"*, as *"tendering costs decrease substantially because the request for proposals is simpler"*. The streamlining of criteria also contributed to this, as a project in which *"five criteria were initially formulated"* ultimately showed that *"three main criteria are sufficient to create differentiation without overburdening the procurement process"* (Participant 21).

This procedure was not perceived as less substantive, because it creates room for in-depth assessments of the core project team. The approach *"provides scope to demonstrate how a project will be tackled and to show what a team can contribute"*. In these interactions, *"masks quickly fall away and it becomes clear how someone truly functions, with strengths and pitfalls"*, leading to conclude that *"it is anything but a beauty contest"*. It was even described as *"an 'ugliness contest'"*, as the focus lies on *"real behaviours rather than polished stories on paper"* (Participant 24).

6.4. Perspective 2: Risk Aversion and Limited Public Client Capability

A perspective in which limited public client knowledge and capability is seen as constraining the application of the two-phase approach, while risk-averse, overly robust designs and limited innovation remain concerns.

Table 13 presents the characterising statements for Perspective 2, showing their position in the composite Q-sort (Q-SV) and corresponding Z-scores, where Z-scores are statistically significant at the 5% level by default and at the 1% level when marked with an asterisk (*), indicating statements that most strongly define this perspective.

Table 13: Characterising Statements of Perspective 2

Nr.	Statement	Q-SV	Z-score
3.	Fails to reach its full potential because public clients lack the capacity to (co-)design, safeguard quality and control costs.	(+4)	1.76*
30.	Reduces the risk of cost and time overruns by allowing more time for risk assessment.	(+4)	1.72
26.	Accepts higher initial costs in exchange for fewer changes and claims during execution.	(+3)	1.31
22.	Provides more innovative solutions due to the longer design phase.	(-3)	-1.60*
19.	Stimulates the use of innovative and sustainable construction methods.	(-4)	-1.62*
21.	Delivers more cost-efficient design solutions.	(-4)	-1.75*
37.	Shortens the total project duration.	(-4)	-1.76*

** Characterising statement at P<0.01*

Lack of Countervailing Power of Public Client

Within this perspective, the approach is seen as highly dependent on the capability of public clients to participate actively from the outset. When this capability is lacking, *"clients lose insight into what happens during design development and why costs increase"* (Participant 1). This was not attributed solely to staffing shortages, but also to a broader loss of expertise and involvement. *"Much of that knowledge has disappeared"*, as many organisations *"no longer employ their own technical staff"* and rely heavily on engineering consultancies, which weakens independence and countervailing power (Participant 17).

Beyond capacity, attitude and behaviour were also highlighted as problematic. *"Too little initiative is taken and too little constructive thinking takes place"*, with public clients tending to wait, postpone decisions and mainly articulate constraints rather than actively seeking solutions (Participant 17). This becomes particularly visible in the early design phase, where uncertainty is still high. Rising estimates at this stage can trigger distrust, as public clients see increasing costs and assume that the contractor is *"adding all sorts of items again"*, reinforcing an us-and-them dynamic (Participant 1).

The preparatory phase determines *"an enormous amount"*, often without a clear understanding of practical consequences. Only later does it become apparent that *"this does not fit, this is not feasible, this is actually far more expensive than assumed"*, because elements were fixed *"without ever being tested for buildability"*. As a result, clients struggle to assess cost estimates properly, not due to unwillingness, but because designs are *"incorrect or too one-sided"*, or requirements conflict with each other (Participant 23).

This problem manifests itself differently depending on project type. In some cases, small design decisions fixed early on can later be adapted intelligently, even if that leads to higher costs because *"you are doing more — and that is often the right discussion to have"* (Participant 23). In large volume projects, however, *"small nuances in the requirements can have enormous effects"*, such as an apparently minor decision, taken to comply with applicable guidelines, to widen a road by thirty centimetres, which *"directly affects construction costs, phasing, and the space required"*. Similarly, route decisions may be made because something *"looks good in a drawing"*, while later proving impractical to build (Participant 23).

Such outcomes could be reduced. *"A small review moment at the outset prevents a project from being pushed in a particular direction that later becomes almost impossible to correct"*, yet many choices are currently fixed far too early. When correction does take place later, *"it requires a great deal"*, as both parties must genuinely trust that they will *"jointly optimise the design, reduce risks, and bring the costs down again"* (Participant 1).

Capability issues were also linked to cost knowledge. *"Public clients often work with SSK cost estimates, while contractors use a different system"*, meaning that both parties are *"not speaking the same language"*. Because public clients do not execute the work themselves, they have less insight into cost components such as logistics and production, which leads to *"structural discussions about costs, even when working in full transparency"* (Participant 1).

This problem was described as structural rather than incidental. Within some organisations, *"the planning-phase estimate remains in place as the truth"*, while later experiences and actual costs are not fed back into the system. As a result, *"the organisation loses its connection with reality"*, cost experts work with outdated figures, and discussions during procurement become difficult, for example when contractors must justify prices to experts *"who do not have up-to-date knowledge"*. This was illustrated with a discussion about the price of a cable, where cheaper online variants were compared without considering contractual specifications (Participant 19).

Resolving this issue would require significant changes. One option would be that *"far more people with experience in cost composition from the market side or the contractor's side start working for the client"*. Another would be *"simply trusting that the other party is not taking advantage of you"*, although this was acknowledged to *"require courage"* (Participant 1).

Prioritising Predictability over Innovation

Within this perspective, the assumption that the two-phase procurement approach leads to more innovation is explicitly questioned. Innovation is not about finding clever tricks on paper, as *"designing cheaply does not exist"*. Instead, designs must be *"buildable, logical, compatible with the phasing, and suitable for the available space"*. Clarity and predictability are more effectively achieved by *"reusing solutions that have already proven themselves"* and by *"reducing variation for variation's sake"*, which helps to avoid surprises and makes it easier for clients to understand cost estimates substantively (Participant 23).

In large and complex projects, the scope for innovation was perceived limited, despite the longer design phase. *"A longer design phase does not automatically lead to innovation"*, as *"the pressure on cost and time is high"*, leaving little room to *"colour outside the lines"*. Innovation may even occur more readily in traditional procurement settings, where contractors must differentiate themselves and clients can explicitly include innovation as an award criterion (Participant 1).

It was questioned whether the approach leads to more cost-efficient design solutions, as in practice *"the contractor often opts for the most aesthetically appealing solution"* or follows *"the architect's design that has already been fixed in the visual quality plan"*. While simplifications may be introduced to limit financial problems, *"that does not make the design cheaper"*, and *"it could have been more efficient"*. From this perspective, design choices are framed as a trade-off rather than a straightforward optimisation, as *"there is always a tension between efficiency and aesthetics"*. Some projects are deliberately made *"more visually appealing than strictly necessary"*, which inevitably increases costs, yet this was not necessarily viewed as problematic, since *"in ten years' time, when the structure is completed and looks good, no one will think about it anymore"*. Instead, it will be regarded as *"a good project that will last for decades"*, raising a fundamental question about priorities, as *"costs are relative; the result endures"* (Participant 17).

The approach tends to encourage overdesign rather than efficiency. While *"good design work is carried out"*, it was emphasised that it is *"not cost-efficient"*, as *"the 'gold-plated edges' emerge more readily"*. Designs become *"thicker, more refined and more robust than necessary"*, while *"the sobriety and functionality that should really be the focus are not visible"* (Participant 26).

This tendency was explicitly contrasted with competitive tendering. In such settings, contractors bear more risk and therefore *"are suddenly able to design less heavily"*, for example by making elements thinner or reducing structural components. In the two-phase procurement approach, however, *"designs become stronger, heavier and more*

stable", because contractors *"only take that risk when it comes out of their own pocket"*. In this approach, they are *"simply paid"*, and optimisation occurs *"only when it benefits them"* (Participant 26).

As a result, designs are filled with mitigation measures that *"would otherwise have been added later"*. These measures are now included upfront, whereas in other approaches contractors might first test whether execution without them would be possible. If that failed, *"it would have been entrepreneurial risk"*. In the two-phase approach, however, *"that risk is now cushioned"* (Participant 26).

This led to concerns about the balance between risk and reward. It was argued that *"contractors in the two-phase approach want little risk but high profit"*, with profit margins *"between four and ten per cent"*, which are higher than in competitive tendering while risks are lower. At the same time, *"low-probability, high-impact risks shift to the client"*, the design becomes heavier, and *"the profit remains high"*, which was described as *"double"* (Participant 26).

Finally, doubts were raised about whether execution will always reflect what was agreed in phase one. If a component has been designed thicker for risk mitigation, *"a cheaper variant could still theoretically be used during execution"*. Although it was stressed that *"not that this happens"*, the concern remains that *"the public client in this approach has already paid for the thicker version"*. More broadly, it was concluded that *"a great deal is being paid now"*, while it *"cannot yet be stated with certainty"* that this consistently leads to fewer changes during execution. Particularly in long-duration projects, *"there will always be changes — including those initiated by the client"*, leading to the conclusion that *"cost-efficient design is not seen within the two-phase approach"* (Participant 26).

Higher Costs in Phase 1 as a Consequence of Extensive Risk Exploration

Within this perspective, higher costs in the first phase are accepted as a consequence of investing time and money in risk assessment before a price is finalised. A substantial amount of time is spent on the risk dossier, particularly on the identification, assessment and management of risks. This is considered unavoidable, especially in renovation projects involving existing assets, where *"it is impossible to know everything in advance"*, as *"you cannot look beneath all the asphalt or open every structure while traffic is still using it"* (Participant 19).

These additional investigations are not framed as inefficiencies, but as a way to reduce uncertainty before execution starts. By examining risks more thoroughly, they can be reduced and assessed more accurately. One example concerned the investigation into the anchoring beneath the asphalt of the approach spans. Through careful examination, *"the residual risk became so small that it was justifiable to place that risk with the contractor"* (Participant 19).

This approach has direct consequences for pricing during execution. Because risks are explored in advance, there are *"hardly any situations during the execution phase in which it was later said: 'we could not have known this'"*. As a result, the execution phase leads to a *"significant reduction in claims and disputes"* (Participant 19).

Risk Reduction Through Preparation Rather than Redistribution

In this perspective, the reduction of cost and time overruns is associated with taking more time in the early phases to identify, assess and manage risks more carefully. As in perspective 1, the emphasis lies on thorough preparation and early risk assessment as a means to stabilise execution, rather than on shifting risks between parties. This was illustrated by a tunnel project in which an initial plan to convert everything in one go would likely have led to major problems. By revising the schedule and *"working in releases"*, these risks were avoided (Participant 4).

Redistributing Time across Phases Rather than Accelerating Delivery

Shortening the total project duration is not seen as a realistic outcome, given the inherent duration of the design process. A design process requires a fixed amount of time for initiation, preliminary design, detailed design and final design, meaning that *"the overall project duration does not become shorter"*. The benefit does not lie in speeding up the process, but in *"preventing delays rather than in speeding up the process"*, because *"better preparation avoids*

major setbacks during execution". As a result, *"the standard project duration therefore changes little, but the likelihood of overruns becomes smaller"* (Participant 4).

The idea that the approach leads to time savings is rejected even more strongly. *"The two-phase approach does not shorten the total project duration – on the contrary"*, with the answer described as *"twice no"* (Participant 26). Both phases are experienced as taking longer than initially expected. Although Phase 1 is often planned within a fixed time frame, *"in practice Phase 1 overruns for all sorts of reasons, including those on the public client's side"*. Consequently, *"within Phase 1 itself, the schedule slips, and Phase 2 then shifts along with it"* (Participant 26).

This dynamic is illustrated by an example in which Phase 1 is initially assumed to take one year and Phase 2 three years, while *"Phase 1 in practice becomes one and a half years and Phase 2 four years"*. Even when execution itself remains relatively stable, *"the total project duration certainly does not become shorter"*. Including the period before procurement does not change this conclusion. Although *"that initial step can in principle be slightly shorter, because the market is approached with a less fully developed tender dossier"*, this advantage is offset because *"Phase 1 then becomes so much longer that the total does not accelerate"* (Participant 26).

A key explanation lies in the nature of the process itself, where time is lost through *"endlessly protracted wrangling over the design and then again over the price"*. Rather than shortening the overall duration, the two-phase approach redistributes time across phases, without reducing the total project timeline (Participant 26).

6.5. Perspective 3: Knowledge continuity as a driver of execution stability

A perspective in which preserving execution knowledge across phases is valued as a means to minimise changes during delivery, even at higher upfront cost.

Table 14 presents the characterising statements for Perspective 3, showing their position in the composite Q-sort (Q-SV) and corresponding Z-scores, where Z-scores are statistically significant at the 5% level by default and at the 1% level when marked with an asterisk (*), indicating statements that most strongly define this perspective.

Table 14: Characterising Statements of Perspective 3

Nr.	Statement	Q-SV	Z-score
1.	Reduces design and scope changes during execution.	(+4)	2.06
5.	Requires retaining knowledge within the project team to function well.	(+4)	1.90*
13.	Creates a more positive, motivating and safe project culture.	(+3)	1.39
22.	Provides more innovative solutions due to the longer design phase.	(+3)	1.09*
38.	Simplifies the procurement procedure compared with traditional integrated contract forms.	(-4)	-1.75
3.	Fails to reach its full potential because public clients lack the capacity to (co-)design, safeguard quality and control costs.	(-4)	-1.75*
35.	Shortens the procurement period significantly compared with traditional procurement.	(-4)	-1.90*

** Characterising statement at P<0.01*

Using Execution Knowledge Throughout the Project Lifecycle

Within this perspective, the emphasis on capability lies primarily in the ability to integrate execution knowledge into the design process from the outset. Compared to traditional approaches, where the public client develops the design and the contractor is only responsible for execution, the two-phase procurement approach ensures that *"the party ultimately responsible for delivering the work is also involved in the design process"*. As a result, *"all the knowledge required to develop a sound and buildable design is present from the very beginning"* (Participant 6).

This early integration has direct consequences for execution. Because the designing party is familiar with execution, *"deviations and changes during execution occur far less frequently"*. Issues that do arise are addressed earlier, as those involved *"feel jointly responsible for the choices made during the design phase"*. Changes that still occur are usually limited to *"small additions or adjustments in scope"* and *"rarely lead to disruptions in progress"*. This way of working is also associated with more proactive behaviour on the work floor, as operational staff *"know exactly where vulnerabilities lie and take responsibility more readily in finding solutions"*. The fact that the design phase is often remunerated on a cost-reimbursable basis further creates room to substantiate design choices carefully, preventing later claims that there was *"insufficient time or resources to avoid problems"* (Participant 6).

Joint design in the first phase contributes to a stable execution process. Because *"many issues that would emerge during execution in traditional contracts are already discussed, examined, aligned or mitigated in the first phase"*, a large share of potential variations disappears. The outcome is described as *"a stable and well-controlled execution process"*, which is regarded as a clear added value of the approach (Participant 16).

Capability is also reflected in improved practical buildability. Within the two-phase approach, contractors often separate their technical disciplines into design and execution, with both sides *"already involved in the first phase"*. As a result, *"the execution side contributes from the very beginning to thinking about buildability"*. This is considered effective, because executors *"are better able to assess what is feasible in practice"* (Participant 16).

From a financial perspective, this capability manifests differently across phases. In Phase 1, *"the definitive price for Phase 2 usually increases considerably"*, which for the public client means *"a larger financial risk, not a smaller one"*, as the price for Phase 2 is already determined while the contractor develops the design and prepares the final offer. At the same time, experience shows that *"once Phase 2 has started, the price remains very stable"*. This stability is attributed to the fact that the project has already been *"jointly thought through thoroughly in the Phase 1"*, resulting in a design that is stable and predictable, with *"hardly any changes during execution"*, even though *"in Phase 1 there may be cost overruns compared to the preliminary or target price"* (Participant 16).

The approach is also seen as strongly supporting knowledge retention within the project team. Because there is *"no strict division between the engineering consultancy and the contractor"*, and because *"the planning phase and the execution phase are seamlessly connected"*, knowledge developed during preparation is preserved during delivery. This contrasts with traditional Design & Construct contracts, where the planning phase is often already fixed before the contractor becomes involved, which *"regularly leads to problems"* because information from the planning phase does not always match what is needed during execution (Participant 6).

One illustrative example concerns soil investigations, where *"the chemical quality of the soil may have been documented thoroughly, while the physical quality — which is crucial for the execution — has not been investigated sufficiently"*. The two-phase approach prevents such disconnects, as *"the context of decisions is preserved"*. Those responsible for execution *"know exactly why certain choices were made during the planning phase"*, reducing the likelihood of redesigns, misunderstandings and knowledge loss (Participant 6).

At the same time, this perspective emphasises that the approach does not function as a substitute for expertise. It *"does not work well if the client lacks sufficient capacity or expertise"*, as *"a project team or two-phase agreement is not a substitute for a professional client"*. To design jointly and make balanced decisions, *"the client must know which knowledge is available internally and where external support is required"*. A capable client ensures that *"the right people are at the table"*, including specialists who understand design, execution and engineering. When this expertise

is missing, *"an unbalanced collaboration emerges in which the contractor determines the direction"* (Participant 6).

This challenge becomes particularly visible when public clients lack cost knowledge. In such cases, *"received prices are often assessed only as a total amount"*, without clarity on whether individual items are realistic. As a result, *"the contractor must be taken at his word"*, even when estimates are explained step by step. The absence of cost knowledge can lead to micromanagement, characterised by *"discussions about small items without an overview of the whole"*, which makes collaboration fragile and slow (Participant 6).

External cost experts are not regarded as a solution, as they are often *"too far removed from practice"* and lack insight into the specific context of the contractor and execution. Their analyses are described as *"too coarse-grained"* and may deviate from reality. From this perspective, the client *"should itself possess sufficient knowledge and cost norms to assess and review estimates"* (Participant 6).

Ultimately, the approach is not seen as a mechanism that automatically increases organisational capability. On the contrary, there is a risk that *"people actually move further away from the substance"* if the process is used as a substitute for expertise. A project with this approach therefore requires public clients who *"understand what is happening, can think along and take responsibility"*. Working with such clients is described as fundamentally different, as *"it is more pleasant to collaborate with someone who knows what they are talking about than with someone who constantly needs to be guided"* (Participant 6).

Phase 1 Cost Growth as a Trade-off for Price Stability During Execution

Within this perspective, pricing is characterised by a clear upward movement during Phase 1. Some public clients starts with a preliminary price, but *"in practice that preliminary price increases substantially"*, depending on the project's risk profile. This increase is linked to uncertainties becoming visible in renovation contexts, such as *"asbestos, chromium-6"*, *"unfavourable soil conditions"*, or *"a poorer condition of the asset to be renovated than expected"* (Participant 16). The consequence is that what begins as an internal reference price does not remain stable during the first phase.

This rising trajectory is not seen as being offset later in the process. Instead, *"the two-phase approach does not compensate higher initial costs with lower final costs"*. What was initially framed as starting costs *"in practice increases significantly during the first phase"* (Participant 16), so that cost growth becomes concentrated at the front end of the project rather than emerging gradually through execution claims.

A central explanation lies in the incentive structure of Phase 1. A reversed dynamic is described, in which the contractor has *"an incentive to develop a robust and conservative (and therefore expensive) design"*, because *"the effort invested is reimbursed"*. As a result, *"the emphasis shifts towards high quality, which leads to higher costs"*. Within public clients this generates pressure in the opposite direction, as there emerges a need *"to moderate quality somewhat"* and to make choices that are *"good enough"* rather than perfect (Participant 16). This tension is experienced as costly, because projects are delivered at a high quality level but at a higher price point.

This also connects to broader observations about comparative cost outcomes. Internal findings indicate that *"a two-phase approach compared to a more traditional D&C contract … turns out to be more expensive"*. A likely explanation is *"the absence of competition in the price formation for Phase 2"* (Participant 16), which weakens the disciplining effect that competitive tendering normally exerts on pricing.

The formal Go/No-Go moment between the phases is framed as offering a safeguard, but in practice it offers limited leverage. Stopping after Phase 1 would leave *"only the design"*, and retendering that design is described as complicated because *"a new contractor would then have to conform to the work of another"*, raising legal and practical complications. Ultimately, reverting to a traditional route would cost time, as *"at least one and a half years is lost"* (Participant 16).

Because this option is not credible, the Go/No-Go moment becomes *"mainly a theoretical anchor point"*. In that situation, the contractor realises that the project *"will almost certainly continue"*, which *"creates room to steer towards*

higher prices". This shifts bargaining power during Phase 1: the client *"can hardly step back without major delay or extra costs"*, and disputes about hours and staffing become difficult to resolve in the absence of market pressure. The outcome is a loss of grip on price development, with the feeling that the public client sometimes pays *"the jackpot"* simply to keep the project moving (Participant 16).

Thorough Procurement over Procedural Simplicity

Within this perspective, the two-phase approach is not experienced as simplifying the procurement procedure compared with traditional approaches. In a classic lowest-price tender, *"the process is straightforward"*: *"a design is available, the requirement is clear, and the lowest price wins"* (Participant 6). Such procedures are *"relatively easy to organise and to assess"*, precisely because the comparison between bidders is unambiguous.

Compared with this, procurement under integrated contracts is already more complex, as *"price and quality are evaluated together"*. Although *"there is not yet a complete design"*, there remains *"a clear price component on which the client can base the assessment"*. Within the two-phase approach, this shift continues further. The emphasis moves away from price towards *"quality and collaboration"*, while *"there is often no developed design and sometimes no concrete price"* (Participant 6).

As a result, the assessment increasingly focuses on *"approach, process and vision"*. These elements are *"far more difficult to evaluate objectively"*, which means that the procurement procedure becomes more complex rather than simpler. This requires *"more preparation and alignment on the evaluation criteria"*, precisely because *"it is not precisely defined what the parties are being compared on"*. In some cases, it was noted that *"it was even unclear what the submitted project vision was being assessed against"* (Participant 6).

A similar rejection applies to the idea that the two-phase approach significantly shortens the procurement period. Whether procurement is shorter depends strongly on *"how the start and end points are defined"*, and *"a shortening of the process is not self-evident"*. For standard projects tendered through a simple price competition, *"the client can often reach contract award quickly"*, in which cases *"the two-phase approach does not provide any time savings"* (Participant 6).

Moreover, the approach is fundamentally different in nature from traditional tendering. The procedure is oriented first towards *"finding the party that best fits the project and the collaboration required"*, after which *"the joint design process begins"*. The duration of this phase therefore depends largely on *"how the team organises the process"*. Viewed as a whole, the issue is less about procurement time in isolation and more about the total project duration. Depending on context and preparation, this may turn out shorter or longer. The approach therefore *"does not, by definition, lead to a faster procurement process"* (Participant 6).

6.6. Conclusion — Identifying Perspectives

This section concludes the findings of the preceding chapter and addresses the third and fourth sub-questions: *How do stakeholders perceive and interpret the two-phase procurement approach in practice?* and *To what extent do stakeholder perspectives on the two-phase procurement approach converge or diverge?*

Interpretations of the Two-phase Procurement Approach

Stakeholder perceptions and interpretations of the two-phase procurement approach are synthesised through the set of themes derived from the ECI literature.

With regard to capability, stakeholders experience the two-phase procurement approach as requiring a more active and knowledgeable public client, as well as stronger communicative and collaborative capabilities from both parties. When such capabilities are present, joint decision-making in early design, risk and pricing stages is perceived as effective; when they are lacking, maintaining oversight becomes more difficult and interactions tend to revert to 'us–them' thinking.

In terms of collaboration, the approach is widely associated with closer working relationships between public clients and contractors. Early contractor involvement, joint design activities and transparency in costs and risks are perceived to reduce adversarial behaviour and to support shared responsibility, open communication and mutual trust.

From a cultural perspective, stakeholders describe the two-phase procurement approach as enabling a move away from adversarial contracting practices, partly due to postponed price formation reducing incentives for bid-low–claim-later behaviour. At the same time, this cooperative culture is experienced as fragile, with stakeholders noting that declining trust or rising costs can quickly trigger a return to defensive and adversarial dynamics.

With respect to innovation, stakeholders do not perceive the two-phase approach as inherently innovation-enhancing. Instead, it is associated with risk-averse behaviour and conservative design choices, reinforced by reduced competitive pressure and greater client awareness of the cost implications of innovation.

Regarding pricing, stakeholders experience greater transparency through the use of cost tables and detailed insight into cost composition. Prices typically increase during Phase 1 due to extensive risk exploration and mitigation, but remain relatively stable during Phase 2. While this transparency can strengthen trust, it is also experienced ambivalently, as it may lead to increased scrutiny and micromanaging when trust or cost knowledge is limited.

With respect to risk allocation, stakeholders experience the approach as promoting risk-averse behaviour. Risks are mitigated early through investigations and robust design choices, resulting in contractors accepting limited risk while public clients retain a larger share. The Go/No-Go moment is experienced as a key milestone for assessing residual risks; however, opting for a No-Go is perceived as costly and time-consuming for public clients, which limits its practical effectiveness.

Concerning transaction costs, stakeholders indicate that the two-phase approach does not necessarily reduce overall costs, but changes their distribution, shifting effort from unpaid tendering towards a paid preparatory phase.

Finally, value for money is interpreted in terms of predictability, quality and stable execution rather than lowest initial price. Whether higher upfront investments translate into improved value for money is experienced as dependent on how the approach is applied in practice.

Convergence Between Perspectives

Across all three perspectives, there is broad agreement on several process-related effects of the two-phase procurement approach. Stakeholders consistently associate the approach with improved collaboration between public clients and contractors, reduced information fragmentation between design and execution, and greater predictability during Phase 2. Early contractor involvement is widely perceived as contributing to more stable project delivery, with fewer changes during construction. It is seen as filtering out extreme project outcomes: projects are less likely to suffer from major costs and time overruns during execution.

In addition, stakeholders agree that costs tend to increase during Phase 1 while remaining relatively stable during Phase 2, reflecting a shift of uncertainty and effort to the early stages of the project. Transaction costs are not necessarily lower overall, but their distribution changes, with reduced bidding costs for contractors and higher preparatory costs for public clients. The Go/No-Go moment is commonly recognised as a milestone that provides structure and direction. Finally, there is consensus that the approach generally leads to higher and more predictable remuneration for contractors.

Divergence Between Perspectives

While stakeholders broadly agree on the observable effects of the two-phase procurement approach, the perspectives diverge in how these effects are evaluated and where the main risks are perceived to lie. The divergence does not concern *what* the approach does, but *what these effects are worth* and *under which conditions they remain acceptable*.

A first point of disagreement concerns the role of transparency and joint decision-making. Perspective 1 views transparency primarily as an enabling mechanism: open-book pricing and shared responsibility are seen as strengthening trust and enhancing project-level control. In contrast, Perspectives 2 and 3 emphasise that transparency only functions effectively when sufficient public client capability is present. Without such countervailing knowledge, transparency is perceived to increase dependence on the contractor and to weaken the public client's ability to steer cost and quality outcomes.

A second point of divergence concerns how higher Phase 1 costs are interpreted. Perspective 1 frames these costs as deliberate investments that reduce risk and support smoother execution. Perspective 2 regards higher upfront costs primarily as the outcome of risk-averse preparation and over-robust design, and does not view them as adding sufficient value in terms of efficiency or innovation. Perspective 3 accepts higher upfront spending as the price of execution stability, but argues that reduced competitive pressure and Phase 1 incentive structures offer insufficient correction against upward cost pressure.

Third, the perspectives diverge in how the Go/No-Go moment is assessed as a corrective mechanism. For Perspective 1, this moment represents a meaningful joint commitment that disciplines the process and aligns incentives. Perspectives 2 and 3, however, question its practical effectiveness. They argue that once substantial investments have been made in Phase 1, opting for a No-Go becomes costly and time-consuming for public clients, which substantially limits their bargaining power. As a result, the Go/No-Go moment functions more as a theoretical safeguard than as a credible exit option capable of disciplining cost development.

Finally, the perspectives diverge in what they treat as the primary indicator of project success. Perspective 1 associates success mainly with a well-functioning collaboration: reciprocal transparency, shared responsibility and a constructive working relationship that supports project-level control. Perspective 2 defines success more conditionally, centring on the public client's ability to maintain substantive oversight of cost, quality and design choices; without sufficient countervailing capability, predictability is achieved at the expense of efficiency and innovation. Perspective 3 places success primarily in execution stability and knowledge continuity across phases, while remaining critical of the limited price discipline created by reduced competition and the weak corrective power of the Go/No-Go moment. Consequently, the acceptable balance between stability, control and cost differs across perspectives.

7

Discussion: Interpreting Trade-Offs Across Perspectives

In this chapter, the findings are discussed in relation to the literature that formed the analytical framework of this study. Building on earlier chapters, which examined fragmentation in infrastructure projects, project delivery models and the expectations associated with the two-phase procurement approach, as well as insights from the ECI literature, this chapter discusses these expectations with the identified stakeholder perspectives. The focus is on the key trade-offs the approach introduces and on how these trade-offs are interpreted across perspectives, leading to an explanation of why stakeholders reach different judgements about its desirability and effectiveness.

7.1. Capability as a Condition for Effective Early Involvement

7.1.1. Capability in the Literature and Practice

The literature emphasises that early contractor involvement can strengthen projects by bringing technical and execution knowledge into the design phase, improving buildability and reducing changes during execution. The findings reflect these improvements. Across perspectives, the two-phase procurement approach is recognised as enabling earlier and more intensive use of contractor expertise in Phase 1, which is consistently associated with a more stable execution phase.

At the same time, the findings underline that early contractor involvement does not remove the need for a capable public client. Even within a collaborative and transparent setting, effective functioning of the two-phase procurement approach presupposes an “intelligent client” who is able to assess choices, interpret information and maintain substantive control. Where public client capability is limited, particularly in Phase 1, oversight is perceived to weaken and dependency on contractor explanations for design, risk and pricing decisions increases.

7.1.2. Discussion: Capability as Countervailing Power

That the two-phase procurement approach leads to a more stable execution phase is largely self-evident. The approach brings execution knowledge into the project at an earlier phase and allows potential construction issues to be addressed before execution starts. The increased emphasis on public client capability follows directly from this shift. By involving contractors early, substantial influence over risk identification, solution development and price formation is placed with the contractor in Phase 1, while competitive pressure is largely absent. Under these condi-

tions, public client capability becomes crucial as a form of countervailing power in a phase where contractor market power is relatively high.

The capability concerns observed in this study should not be interpreted as a lack of technical knowledge on the public client side. Rather, they reflect how public client roles have been shaped by long-standing procurement practices. Decades of lump-sum contracting have granted limited insight into actual cost structures and reduced opportunities to develop cost benchmarks and systematic learning across projects. As a result, the ability to assess early cost-related decisions in an open and transparent setting is relatively new. The two-phase procurement approach does not create this limitation, but makes it visible earlier in the process, in Phase 1 rather than during execution.

An important part of the capability challenge lies outside Phase1 itself. Many decisions that strongly shape cost and feasibility are made earlier, during the preparatory phase, when scope, requirements and problem definitions are (partly) fixed under conditions of uncertainty and later prove difficult to revise. Public client capability therefore also concerns the ability to recognise, question and revisit early assumptions once their implications become visible in Phase1. To make effective use of contractors' expertise, public clients must actively create room in the planning and decision-making process to accommodate adjustments based on the knowledge contributed.

It is notable that concerns about public client capability are voiced predominantly by contractors. This suggests that capability also functions as a positioning device. By framing challenges in terms of limited client capability, execution-oriented expertise is implicitly presented as more authoritative in defining what is realistic or prudent. In combination with the limited countervailing power created by reduced competition, this reinforces an us–them dynamic in which responsibility for uncertainty and cost development is unevenly distributed.

7.2. Collaboration as a Fragile but Valued Arrangement

7.2.1. Collaboration in the Literature and Practice

The literature positions collaboration as a deliberate response to the adversarial working relations. Such relations are associated with fragmented responsibilities, opportunistic behaviour and conflicts that typically emerge during execution. ECI-based approaches aim to replace this dynamic with earlier interaction, greater transparency, in which issues of feasibility, risk and consequences are addressed before execution starts. The findings of this study reflect this shift. Across perspectives, the two-phase procurement approach is associated with closer working relationships and a reduction of adversarial behaviour. Where discussions move away from negotiating over contractual positions and risk allocation towards shared problem-solving in Phase1.

Importantly, collaboration is valued not only for its effects on the stable Phase 2, but also for its impact on the improved working environment. Projects are experienced as more attractive to work on, with greater openness and engagement across project phases. Transparency, particularly with regard to costs, is consistently identified as an important mechanism supporting this collaborative dynamic. At the same time, both the literature and the findings emphasise that collaboration does not follow automatically from procedures alone, but strongly depend on changes in behaviour. While collaboration was experienced as improved in many projects, the findings also point to its vulnerability: when trust is undermined by disputes over costs or by decisions taken in earlier phases, collaboration can deteriorate rapidly.

7.2.2. Discussion: Trust, Vulnerability and Behavioural Dependence

The strong appreciation of collaboration within the two-phase procurement approach reflects a desire to move away from adversarial ways of working. The improved collaboration is experienced as a relief from conflict-driven project environments and aligns with the professional motivation of many actors to focus on solving problems and delivering public infrastructure, rather than on continuous disputes.

At the same time, the form of collaboration does not eliminate mistrust. A certain degree of caution remains

present, particularly at the start of projects. Trust does not automatically emerge from this approach, but needs to be present from the outset for the collaboration to function. When project results disappoint or discussions become difficult, teams tend to fall back on familiar patterns of behaviour, and earlier adversarial reflexes can quickly re-emerge.

This makes this way of collaboration a fragile arrangement. Its functioning depends heavily on the attitudes of the individuals involved and their willingness to accommodate each other, rather than on formal safeguards. The limited corrective function of the Go/No-Go moment reinforces this dependence, as there are few mechanisms to intervene once collaboration begins to deteriorate. When trust weakens or discussions become stuck, teams must rely largely on personal commitment to work through impasses, even though underlying financial interests continue to diverge.

At sector level, these findings raise questions about the extent to which the two-phase procurement approach can be adopted more broadly. Although there is a desire to move away from adversarial practices, collaborative working requires high levels of trust, professionalism and relational maturity that cannot yet be assumed across all of the sector. Given the persistence of strained working relationships within the sector, collaboration remains highly dependent on favourable behaviour and context, making it unsuitable as a default approach. The two-phase procurement approach therefore appears most appropriate in situations where there are compelling reasons to prioritise execution stability, rather than as a generally applicable approach.

7.3. Culture Change under Conditional Trust

7.3.1. Culture in the Literature and Practice

In the literature, ECI is primarily discussed in terms of creating an improved working culture within projects. This includes reducing 'us–them' thinking and fostering trust, transparency and mutual respect. Concepts such as no-blame principles and pain/gain arrangements are presented as mechanisms intended to support this improved culture, as they encourage collective problem-solving instead of fault attribution. At the same time, the literature notes that such cultural change is difficult to embed, pointing to persistent barriers such as limited public client commitment, reluctance to share information fully, cultural resistance and institutional inertia.

The findings show a strong degree of satisfaction among actors with the working culture. Where the two-phase procurement approach functioned as intended, respondents described a more open and constructive atmosphere, reduced 'us–them' dynamics and a greater willingness to act in the interest of the project as a whole. This improved working culture was experienced as motivating and professionally rewarding. At the same time, the findings also indicate that these cultural conditions were not uniform across all situations and were subject to pressure, particularly when costs increased or trust came under strain, reflecting the barriers identified in the literature.

7.3.2. Discussion: Temporary Change or Structural Shift

The cultural change will not be visible when collaboration runs smoothly, but when trust is tested, costs increase or decisions become difficult to justify. It is in these situations that underlying norms and behavioural reflexes resurface. The generally positive assessment of working culture in this study should therefore be interpreted with caution. While many actors expressed genuine enthusiasm for this way of working, this positivity is closely linked to the context in which the projects were carried out. Pilot settings, high levels of attention and the involvement of motivated and experienced individuals created favourable conditions for an improved working culture. At the same time, critical views on trust, cost development and responsibility were present, but less prominently expressed, suggesting that the observed improvement is not uniformly shared.

These critical perspectives should not be understood as a moral failing. For many actors, caution and control reflect rational responses shaped by long-standing experience in adversarial environments where trust was often

punished rather than rewarded. From this perspective, the two-phase procurement approach does not replace existing cultural patterns, but temporarily suppresses them under favourable conditions. As projects scale up or financial pressure increases, these underlying cultural tensions could re-emerge.

This points to a deeper cultural question about who carries change within the sector. Cultural shifts tend to be driven by relatively small groups of individuals who are willing and able to work differently despite uncertainty and pressure. While such actors did appear in the study, this still raises doubts about whether their numbers and influence are sufficient to sustain cultural change across the sector as a whole.

7.4. Innovation under Conditions of Risk Aversion

7.4.1. Innovation in the Literature and Practice

In the literature, innovation is associated with ECI through the creation of space for alternative design solutions, improved construction methods and more efficient or sustainable outcomes. Innovation is generally not framed as an end in itself, but as part of broader value creation for public clients. At the same time, the literature emphasises that innovation is depending strongly on public client flexibility and willingness to accommodate new ideas, given the additional uncertainty and perceived risks involved.

The findings of this study show that innovation was not experienced as encouraged within the approach. Phase 1 was predominantly oriented towards predictability, soberness and risk reduction. Under tight budgets, innovation was often perceived as introducing additional risk and therefore had limited room to develop. Innovation mainly occurred in projects where it was explicitly requested by the public client or where additional budgetary space was created to allow for experimentation.

7.4.2. Discussion: Predictability over Experimentation

Innovation within the two-phase procurement approach is present only in a highly constrained form. Rather than creating space for experimentation or fundamentally new solutions, innovation is largely reduced to marginal optimisation within familiar and defensible solution spaces. Ideas are considered acceptable primarily when they fit within existing technical frameworks and do not introduce additional uncertainty. As a result, the scope for innovation is narrow, and genuinely exploratory or transformative solutions are rarely pursued.

A second factor limiting innovation is the weakened role of competition. In traditional procurement processes, innovation often functions as a means of differentiation. Within this approach, this incentive largely disappears, as contractor selection takes place before most of the prices are fixed and design choices are fully developed. Without strong competitive pressure, there is little incentive for contractors to propose innovative solutions, particularly when such solutions introduce additional risk or effort. What remains is a preference for proven approaches that align with the dominant logic of predictability and risk control.

Finally, transparency alters how innovation is assessed by public clients. Through open-book practices and early cost development, the costs, risks and uncertainties associated with innovative solutions become visible at an early stage. This changes the cost–benefit assessment of innovation for the public client. Where innovative ideas may previously have appeared attractive under less transparent contracting arrangements, this approach confronts public clients with their financial and risk implications. Innovation is therefore more often consciously rejected, not because it is undesirable in principle, but because, in most of these projects, it is no longer considered worth the associated costs and uncertainties.

7.5. Pricing Transparency and the Reversal of Responsibility

7.5.1. Pricing in the Literature and Practice

In the literature, pricing is presented as an area where ECI can improve transparency and cost control, thereby reducing exposure to price fluctuations during execution. At the same time, it is clear that ECI is not aimed at achieving cost savings. Public clients often view lower costs as unlikely, while transparency is described as conditional on contractors perceiving profit margins and risk compensation as reasonable.

The findings of this study largely reflect this. Stakeholders experienced significantly greater transparency in pricing. This transparency was widely perceived as strengthening trust, as it reduced the sense that costs were obscured or strategically manipulated. Contractors generally expressed satisfaction with this way of working and indicated that they were able to operate comfortably within transparent pricing arrangements, because the remuneration and risk coverage were considered fair.

At the same time, pricing transparency was experienced as a double-edged phenomenon, particularly on the public client side. When trust or cost knowledge was limited, detailed insight into costs could trigger increased scrutiny and micromanagement, shifting discussions away from substantive project choices towards control-oriented debates. In addition, it became clear that pricing under the two-phase procurement approach involves an explicit trade-off. By identifying and pricing risks early, the approach reduces extreme cost overruns and surprises during execution, but does so by accepting higher upfront costs in Phase 1. As a result, pricing is experienced as a way of narrowing the range of possible outcomes, effectively exchanging volatility for higher average prices.

7.5.2. Discussion: Transparency, Judgement and Restraint

Pricing within the two-phase procurement approach should be understood as a shift in responsibility. Through open-book pricing, market competition no longer functions as the primary benchmark for determining whether prices are reasonable. Instead, public clients are required to assess and defend whether proposed prices, risk allowances and margins are market-conform. This effectively reverses the traditional burden of proof: rather than the market demonstrating price sharpness, public clients must now justify why a price is considered excessive. It is therefore understandable that pricing is experienced as demanding and frustrating on the public client side.

At the same time, higher prices in Phase 1 should not automatically be framed as problematic. If the objective of the two-phase procurement approach is to reduce failure costs and support a more stable and healthy construction sector, then accepting a risk premium is a logical consequence. Expecting these benefits without being willing to pay for it is internally inconsistent. From this perspective, criticism of higher upfront costs risks becoming hypocritical when it ignores the explicit trade-off on which the approach is based.

The core difficulty lies not in the existence of risk premiums, but in determining what constitutes a reasonable risk premium. As discussed in the capability section, public clients currently lack robust reference points for assessing prices. Transparency has increased faster than the capability to interpret it. As a result, pricing discussions are sometimes tense not because transparency is undesirable, but because judgement must be exercised in the absence of well-established benchmarks. Establishing such benchmarks is itself challenging, given constantly changing suppliers and market conditions.

Importantly, responsibility for maintaining trust in pricing does not rest with public clients alone. Contractors who benefit from the two-phase procurement approach also carry responsibility to act with restraint. Project teams have demonstrated that transparent and collaborative pricing can function in practice. However, when commercial pressure from higher organisational levels pushes for extra margins, this undermines the trust that is built at project level. Using transparency to justify relatively high margins or excessive risk allowances quickly triggers renewed control reflexes on the public client side and risks driving relationships back towards adversarial patterns. If reduced risk and lower transaction costs are the intended outcomes of the two-phase procurement approach for contractors,

then more moderate returns are a logical counterpart. Pursuing high profit margins within a transparent, low-risk setting reflects a pricing logic that is more consistent with lump-sum contracting and its associated risk allocation. Expecting project teams to collaborate openly while simultaneously being pushed to increase margins creates an internal contradiction that undermines the credibility of the approach.

The findings therefore suggest that, while project teams are capable of operating within the logic of the two-phase procurement approach, alignment at higher organisational levels on both the public client and contractor side is required for pricing practices to remain credible and sustainable.

7.6. Risk Allocation through Early Reduction rather than Transfer

7.6.1. Risk Allocation in the Literature and Practice

In the literature risk allocation is identified as a central motivation for involving contractors at an early stage. ECI is expected to enable earlier identification, discussion and mitigation of risks, allowing technical, scope-related and organisational uncertainties to be addressed before execution. Rather than focusing on contractual risk transfer, the literature emphasises joint risk assessment and early risk reduction, with the aim of lowering overall exposure and preventing cost and time overruns. At the same time, studies note that ambiguity in responsibilities and a tendency for residual risks to remain with the public client persist, even within collaborative procurement models.

The findings of this study largely reflect this orientation. Across perspectives, the two-phase procurement approach is primarily understood as a mechanism for reducing risks ahead of Phase 2, rather than for redistributing them between parties. These early risk-coping efforts are consistently associated with greater predictability during execution and fewer surprises in Phase 2.

An observation is that risks are not so much transferred as they are addressed upfront. Contractors benefit from entering Phase 2 with a clearer and more stable risk profile, while public clients retain a substantial share of residual risk, particularly financial risk. This is reflected in higher costs during Phase 1, as uncertainties are explicitly identified, mitigated and priced. In this sense, risk allocation under the two-phase procurement approach is characterised by early risk concentration and reduction, rather than by a shift of responsibility away from the public client.

7.6.2. Discussion: Proportionality and the Limits of Risk Reduction

The findings show that the two-phase procurement approach is effective in reducing execution-phase risks. By addressing uncertainties early, many of the disruptions and financial shocks that could arise during construction are avoided. This reduction in volatility benefits contractors by protecting margins and aligns with public clients' desire for greater predictability and control.

At the same time, the findings indicate that this strength can become a vulnerability. Project teams often respond to the shared responsibility for risk by adopting strongly risk-averse behaviour. Extensive analyses, robust designs and conservative assumptions are used to minimise residual uncertainty as much as possible before execution. While this reduces execution risks, it also raises the question of proportionality. Each additional reduction in uncertainty comes at increasing cost, and the balance between effort and benefit becomes increasingly difficult to justify.

This tendency is reinforced by the professional orientation of many project teams. Technical specialists are inclined to optimise designs and solutions beyond what is strictly necessary for project performance, particularly in a collaborative setting where quality and thoroughness are valued. Without clear stopping rules or countervailing judgement, the approach can therefore overshoot its original objective, shifting from sufficient risk reduction towards excessive precaution.

From a public perspective, this raises fundamental questions about affordability and prioritisation. Achieving more robust and comprehensive solutions within individual projects can be technically and financially rational, as additional upfront investment may reduce future interventions and lifecycle costs. However, applying this logic system-

atically becomes difficult to reconcile with the scale and urgency of broader renewal and replacement programmes. In large portfolios of ageing infrastructure, doing everything 'right' in one go risks slowing delivery and constraining available budgets and capacity. Risk cannot be eliminated everywhere at once, making prioritisation unavoidable and requiring deliberate choices about where higher upfront investment is justified and where residual uncertainty must be accepted.

These findings underline that effective risk allocation within the two-phase procurement approach depends not only on early contractor involvement, but also on the public client's ability to make and defend cost–risk trade-offs and to exercise sufficient countervailing power. Reducing execution risks is valuable, but not unlimited. Without deliberate restraint and strategic prioritisation, the approach risks becoming financially unsustainable as it is increasingly adopted, even as it delivers positive outcomes at the project level.

7.7. Redistribution of Transaction Costs

7.7.1. Transaction Costs in the Literature and Practice

In the literature, transaction costs present a mixed picture. On the one hand, ECI is associated with longer preparatory and design phases, which can increase transaction costs due to more intensive coordination and upfront analysis. On the other hand, early collaboration and trust are expected to reduce administrative and legal transaction costs by limiting defensive documentation, renegotiation and disputes.

The findings of this study largely reflect this mixed assessment. The two-phase procurement approach does not reduce transaction costs overall, but redistributes them. Instead of concentrating effort in an intensive and partly unpaid tender phase, a substantial share of time, capacity and resources is shifted to a compensated Phase 1. This redistribution affects parties differently: contractors face lower direct tendering costs as unpaid proposal work is replaced by paid preparatory activities, while public clients experience higher transaction costs due to increased demands on coordination, decision-making and process management. At the same time, it was noted that competitive pressure for contractors does not disappear. Although tendering takes a different form, contractors remain strongly motivated to win projects and continue to invest considerable effort and resources in doing so, albeit in different ways. Both parties nevertheless benefit from lower administrative and legal transaction costs, as disputes during execution are reduced.

7.7.2. Discussion: Selectivity and Organisational Alignment

By shifting the emphasis away from price-focused tendering towards qualitative selection, the approach reduces the resources required to develop competitive pricing and detailed plans, while placing greater emphasis on the people who will work on the project. This shift matters, because the findings show that the success of the approach depends heavily on the individuals involved and their ability to work collaboratively. Investing in collaboration at an early stage therefore could provide greater assurance of project success than relying on elaborate tender submissions.

Focusing on people rather than paperwork can also help limit duplicated tendering effort. Contractors remain highly motivated to win projects, even when tendering takes a different form, and continue to invest significant resources to do so. However, when selection is based on team quality and collaboration, this effort does not need to result in large volumes of documentation produced by extensive tender teams.

At the same time, this reinforces the need to apply the two-phase procurement approach selectively. Selecting on people increases pressure on an already tight labour market, particularly for experienced professionals capable of working effectively in these settings. Not every project requires this level of early interaction. Clear justification is, again, therefore needed for when the approach is applied, based on project complexity and uncertainty.

Finally, the redistribution of transaction costs between public clients and contractors can be considered reasonable, but only under certain conditions. Public clients accept higher process-related effort in exchange for fewer dis-

putes and more stable execution. This balance becomes problematic when reduced tendering effort for contractors is combined with high profit margins. In such cases, public clients bear higher transaction costs, while contractors benefit from both lower tendering costs and high, stable profit margins. For the approach to remain credible, pricing and remuneration practices must remain aligned with the reduced risk profile.

7.8. Value for Money as Context-Dependent Judgement

7.8.1. Value for Money in the Literature and Practice

In the ECI literature, value for money is framed as achieving the best overall outcome for public resources. Early integration of construction knowledge is expected to support better-informed trade-offs between quality, risk and long-term performance. At the same time, the literature notes that value for money is difficult to demonstrate in practice, because many benefits are indirect, context dependent and only become visible later in the project lifecycle.

The findings of this study show that the two-phase procurement approach shifts how value for money is judged in practice. Across perspectives, value is primarily associated with making defensible choices under uncertainty and developing a price that is transparent and broadly perceived as fair. Rather than “sharpness” at the moment of award, value for money is increasingly assessed through the quality of the underlying reasoning: which risks are addressed, which performance is prioritised, and how cost development is explained and justified.

Value for money is therefore closely linked to Phase 1 as a decision-making phase. Additional effort and cost in Phase 1 can be seen as an investment in execution stability, but the findings also show that this logic is conditional. When scope growth is not contained, when risk allowances are not critically challenged, or when robustness becomes an end in itself, higher upfront costs can weaken rather than strengthen value for money. This makes value for money in the two-phase procurement approach highly context dependent: it is most plausible where Phase 1 genuinely reduces downstream disruption and where public clients are able to maintain discipline in early trade-offs.

7.8.2. Discussion: When Higher Upfront Costs Are Justified

The two-phase procurement approach does not automatically improve value for money across all projects. Any increase in value for money is mainly achieved in projects with relatively high uncertainty and risk. In such projects, early risk reduction, better preparation and a more stable execution phase can outweigh the higher upfront costs. In projects with limited uncertainty, this added value is much less evident, making the approach harder to justify.

Whether the risk premium associated with the approach is ultimately “worth it” is difficult to determine at this phase. Doing so would require a large number of completed projects and reliable data on final costs, delays, failures and downstream effects. In the absence of such data, what becomes visible first is an increase in average costs due to the risk premium. Drawing early conclusions that the approach is therefore too expensive is premature and ignores the longer-term effects that are not yet fully observable.

Value for money should also not be assessed solely in financial terms. The findings indicate that a more stable execution phase can significantly reduce disruption. In addition, improved collaboration reduces conflict and creates a more attractive working environment. This matters not only for project performance, but also for the construction sector more broadly. If the sector aims to attract and retain skilled professionals, it must offer ways of working that are less adversarial and more rewarding. A working environment characterised by constant disputes and pressure undermines this goal and represents a loss of value that is rarely accounted for.

7.9. Explaining Divergence Between Stakeholder Perspectives

The analysis shows that the different perspectives do not stem from disagreement about how the two-phase procurement approach functions in practice. Participants largely recognise the same developments, but differ in how they

value the trade-offs the approach introduces and in which outcomes they prioritise. The core difference between perspectives lies in how value for money is interpreted and in whether the observed benefits—such as risk reduction, improved collaboration or greater control—are considered worth the associated costs and effort.

What stands out is the generally positive evaluation of the approach among participants who are directly involved in projects. A plausible explanation is that they actively experience the operational benefits of the two-phase procurement approach in their day-to-day work. For people working within projects, the approach represents a clear improvement in practice: collaboration improves, transparency increases, conflicts are reduced, and execution becomes more predictable. Although costs increase in the early phase, these higher costs are often perceived as acceptable because the benefits are tangible and directly experienced.

This may also help explain why a strongly negative perspective on costs did not prominently emerge in the study. Interviews suggested that, particularly on the public client side, a more critical perspective on cost development might be expected. However, critical views focusing primarily on higher prices were expressed by only one participant—a cost advisor at the public client—rather than being widespread across the dataset. This suggests that scepticism towards the two-phase procurement approach may be more prevalent outside the project context, among actors who are less directly exposed to its operational benefits and who primarily encounter the approach through higher price levels and budgetary comparisons. These actors see the costs, but not the benefits that shape the experience of those working within projects.

8

Implications for Practice and Theory

This chapter discusses the implications of the findings for both practice and theory. The findings highlight a number of points of attention that emerge from the different perspectives on the two-phase procurement approach. These points indicate where tensions, trade-offs and governance questions arise in practice and where explicit reflection may be required when applying the approach in future projects.

8.1. Practical Implications

8.1.1. Implication Perspectives on the Approach

The findings show that stakeholders largely recognise the same functioning of the two-phase procurement approach, but differ in what they expect the approach to deliver. In practice, this means that the approach can be applied with different, and sometimes implicit, assumptions about what constitutes success. These assumptions influence how developments are interpreted and judged, not only within project teams but also across organisational levels. Even where expectations are aligned at project level, they may diverge at higher managerial or political levels, where considerations such as budget ceilings, financial returns or portfolio-level priorities play a more prominent role.

Where such differences remain unaddressed, tensions may arise when decisions are assessed against different criteria at different levels of the organisation. These tensions are therefore not necessarily the result of poor project performance, but of misalignment between evaluative perspectives across organisational layers.

From a practical perspective, this highlights the importance of making expectations about the approach explicit not only within project teams, but also across organisational levels. Applying the approach implies accepting specific trade-offs. When these trade-offs are not explicitly recognised and shared across levels, tensions at higher levels can cascade back into the project, undermining collaboration and reinforcing adversarial dynamics.

8.1.2. Capability of the Public Client

The two-phase procurement approach places greater demands on public client capability in the early phases of projects, where decisions are shaped in close interaction with contractors and competitive pressure is limited. In practice, this requires public clients to act as an effective countervailing power. This goes beyond interpreting information or assessing alternatives and includes the ability to critically evaluate and challenge contractor input, question underlying assumptions and assess whether proposed solutions, risk mitigation measures and cost developments are proportionate.

Where such capability is insufficient, transparency risks reinforcing dependence on contractor explanations or triggering a shift towards formal control mechanisms. However, the corrective function of these mechanisms is limited within the two-phase procurement approach due to the weakened role of the Go/No-Go decision. This further increases the importance of public clients being able to engage with contractors on substantive terms and to operate within the same technical and financial language. Without this ability, there is a risk that contractor expertise becomes dominant, allowing contractors to steer decisions with limited effective challenge.

From a practical perspective, this highlights the importance of explicitly considering whether the required level of public client capability is available when applying the two-phase procurement approach.

8.1.3. The Go/No-Go Decision

The Go/No-Go decision is intended to function as a corrective checkpoint within the two-phase procurement approach. In practice, however, its corrective effect is limited, as a No-Go often implies returning to a lengthy and costly procurement process. As a result, the decision tends to function more as a procedural milestone than as a genuine opportunity to reconsider project continuation.

From a practical perspective, strengthening the Go/No-Go decision requires treating a No-Go as a legitimate and anticipated outcome rather than as an exceptional failure. This implies explicitly allowing for the possibility that not every Phase 1 trajectory will proceed to execution, including reserving time and budget for such outcomes. Reframing the Go/No-Go decision in terms of avoiding execution-phase failure costs—rather than as an assessment of whether Phase 1 has been completed successfully—can further lower the threshold for its use.

In addition, the corrective function of the Go/No-Go decision can be strengthened by moving away from an all-or-nothing logic. Allowing for intermediate outcomes, such as pausing, rescoping or continuing under explicit conditions, makes it easier to intervene when concerns arise while preserving the benefits of the preparatory work already undertaken. In this way, the Go/No-Go decision can function as a meaningful governance instrument that supports better preparation and reduces the risk of costly problems during execution.

8.1.4. Room for Manoeuvre at Project Level

By reducing fragmentation between design and execution, the two-phase procurement approach increases the significance of decisions made earlier in the project lifecycle. As a result, fragmentation between the exploration phase and Phase 1 becomes more consequential for the room for manoeuvre available during early collaboration. In practice, public clients often already seek to preserve flexibility at this stage. However, where extensive requirements, fixed solution directions or early commitments nevertheless become dominant, the scope for joint exploration in Phase 1 can be significantly constrained. This, in turn, reduces the added value of involving contractor expertise at an early stage.

From a practical perspective, preserving room for manoeuvre therefore requires continued restraint in the exploration phase. Rather than fixing detailed requirements and solutions upfront, public clients should focus on defining objectives, constraints and budgets, while deliberately maintaining space for project teams to explore and develop suitable solutions within those boundaries. Where this balance is not consistently achieved, the adaptive potential of the two-phase procurement approach remains vulnerable, despite the collaborative intent underlying Phase 1.

8.1.5. Innovation within the Approach

While early collaboration is often associated with innovation, the findings show that innovation does not automatically emerge within the two-phase procurement approach. In practice, Phase 1 is predominantly used to reduce uncertainty and stabilise execution. Within this context, innovation is approached cautiously, as it is often perceived to introduce additional risk or cost uncertainty.

As a result, innovation tends to be considered acceptable mainly when it directly supports risk reduction, cost control or execution feasibility, rather than as an independent objective. Where innovation competes with predictability and risk control, it is typically deprioritised. This suggests that, within the two-phase procurement approach, innovation will not materialise unless it is explicitly valued alongside these dominant priorities.

From a practical perspective, this implies that public clients who seek to stimulate innovation must actively create the conditions for it to occur. This requires making innovation an explicit objective in Phase 1 and allocating dedicated time, budget or risk tolerance to support it. Without such deliberate positioning and resourcing, innovation is likely to be crowded out by risk-averse behaviour, even in settings characterised by early collaboration and openness.

8.1.6. Costs and Early Visibility

The two-phase procurement approach shifts cost development to an earlier stage of the project. Costs typically increase during Phase 1 as uncertainties are explored and mitigated, while Phase 2 is experienced as more predictable. Rather than reducing costs, the approach primarily changes the timing and visibility of cost increases.

In practice, this early visibility of cost development creates tension. Cost increases that would previously have materialised during execution now become visible before construction starts, at a point where projects are more exposed to scrutiny from management and political stakeholders. As a result, early cost increases may be interpreted as overruns or inefficiency, even when they reflect deliberate risk reduction and contribute to more stable execution later on. This can trigger renewed control-oriented behaviour or scepticism during Phase 1, potentially undermining the collaborative dynamic.

At project level, higher upfront costs may be considered acceptable in exchange for predictability and reduced execution risk. At programme or portfolio level, however, the cumulative effect of such early cost increases becomes more difficult to absorb and to explain. This highlights the importance of how early cost visibility is interpreted, communicated and governed across projects. Without a shared understanding that higher upfront costs can represent an investment in stability rather than a loss of control, early transparency risks being perceived as a problem rather than as an intended feature of the two-phase procurement approach.

8.2. Theoretical Implications

This study contributes to the literature on ECI by showing that the two-phase procurement approach does not remove tensions inherent to client–contractor relationships, but redistributes them across the project lifecycle. Rather than concentrating conflict during execution, the approach shifts key tensions to earlier stages, where design choices, risks and costs are discussed before construction starts. This supports execution stability and reduces failure costs, not by eliminating tension, but by addressing it at a point where change is less disruptive. Early contractor involvement can therefore be conceptualised as a temporal reconfiguration of tension, rather than a mechanism of conflict reduction.

A second implication concerns the nature of these tensions. Under traditional and integrated models, conflicts often revolve around contractual interpretation and fault attribution during execution. Within the two-phase procurement approach, these conflicts are transformed into tensions around trade-offs under uncertainty, such as the acceptable level of risk reduction, robustness and upfront cost. This suggests that early contractor involvement shifts conflict from a legal–contractual domain to a governance domain, where judgement, justification and accountability become central.

A third theoretical implication relates to risk behaviour. While ECI aims to reduce uncertainty, the findings suggest that it can also reinforce risk-averse behaviour. The shared responsibility for risk identification and early cost transparency encourage conservative design choices, extensive analysis and robust solutions aimed at minimising residual uncertainty. Although this supports predictability, it may also lead to over-precaution and rising upfront

costs. From a theoretical perspective, early contractor involvement should therefore be understood as shaping risk behaviour, potentially trading uncertainty reduction for increased conservatism rather than fostering experimentation or innovation.

Finally, this study extends fragmentation theory by showing that early contractor involvement does not simply reduce fragmentation, but redistributes it. While fragmentation between design and execution is reduced, the significance of decisions made earlier in the project lifecycle increases, making fragmentation between planning and design more consequential.

9

Limitations and Further Research

This chapter outlines the limitations of the study and identifies directions for further research. While these limitations do not affect the internal consistency of the findings, they do influence how broadly the results can be interpreted and highlight where caution is needed and where future research could provide additional insights.

9.1. Limitations

9.1.1. Choice of Q-methodology

Q-methodology is well suited to systematically identify shared viewpoints, but it also comes with limitations. First, the method does not aim for statistical generalisation: the resulting perspectives reflect the viewpoints present among the participants in this study, not their prevalence in the wider population (Molenveld, 2020). Second, the quality of the outcomes depends strongly on how well the Q-set represents the breadth of the debate and whether the participant group covers a sufficiently diverse range of experiences. If relevant viewpoints are missing or underrepresented, the factor structure may become less clear and harder to interpret (Molenveld, 2020). Third, factor interpretation inevitably involves researcher judgement. Participants may attach different meanings to similar statement patterns, and alternative readings of the same factor remain possible (Molenveld, 2020).

In addition, Q-methodology primarily produces descriptive accounts of perspectives rather than causal explanations. Questions about why certain views emerge, how they relate to project outcomes, or under which conditions they change require complementary methods (Minkman and Molenveld, 2020). Finally, the method captures opinions at a particular moment in time. This makes it less suited to studying how viewpoints develop across project phases or how experience with repeated applications affects perceptions (Molenveld, 2020).

Finally, Q-methodology is not free from researcher bias. The researcher plays an active role in constructing the concourse and selecting the Q-set, which inevitably involves interpretative choices regarding which viewpoints are included, how statements are formulated, and how balance across the debate is achieved. In addition, analytical decisions such as the number of factors retained and the thresholds used for significant loadings influence the resulting factor structure. Most explicitly, the interpretation and labelling of factors relies on researcher judgement, meaning that alternative readings of the same factor solution remain possible. The findings should therefore be understood as an analytically grounded but situated interpretation of the perspectives present in the data, rather than as a definitive account.

9.1.2. Design of the Q-set and Forced Distribution

A further limitation concerns the forced distribution used in the Q-sort. The distribution in this study included relatively many positions at the extremes and fewer positions in the middle. This structure may have encouraged participants to place more statements in the extreme categories than they would have done in a less restrictive sorting scheme. As a result, subtle differences among moderately positive, neutral, or mixed evaluations may be less visible in the composite rankings.

At the same time, it should be noted that forced choice is a core feature of Q-methodology, as it helps participants articulate priorities and trade-offs. However, using a slightly flatter distribution with more mid-range positions could have reduced pressure to polarise statements and may have generated more nuanced patterns for statements that participants generally agreed with but did not experience as decisive.

9.1.3. Overlap, Balance and Wording of Statements

Another limitation relates to the composition and phrasing of the statements. Some statements addressed closely related issues and partially overlapped conceptually. This may have complicated the sorting task, as participants had to rank statements that differed only in emphasis while pointing in a similar direction. Such overlap can blur distinctions between factors and can make it harder to connect rankings to clearly separable underlying viewpoints.

In addition, the Q-set contained relatively many positively framed statements. Several participants indicated that this made the task more difficult, because they broadly agreed with many statements and were then forced to rank positive statements against each other. This can lead to rankings that reflect relative preference rather than clear endorsement versus rejection. Finally, the wording of some statements triggered discussion about specific terms rather than about the intended underlying issue. In a few cases, statements were misread or interpreted in the opposite direction. Although follow-up questions were used to clarify interpretations, this remains a limitation for how precisely some rankings can be linked to the intended constructs.

9.1.4. Construction of the Concourse

The concourse from which the Q-set was derived relied heavily on academic literature, policy documents and publicly available project evaluations. While this ensured alignment with dominant and formal discourses around two-phase procurement, it may also have reinforced a relatively positive framing of the approach. Public project documentation often highlights success narratives and may downplay controversy, internal tensions, or unresolved concerns.

Including more exploratory interviews during the concourse-building phase could have broadened the range of statements, particularly by capturing more informal, practical, or critical considerations that are less visible in formal documents. A broader concourse could have strengthened the balance between positive, neutral and critical claims and may have increased the likelihood that more marginal viewpoints would emerge as distinct factors.

9.1.5. Representation of Critical Viewpoints

During the preparation of the study, exploratory conversations suggested that more critical views on the two-phase procurement approach were present in the field, particularly among public clients. In the final Q-study, however, strongly critical positions were only weakly represented in the P-set and did not emerge as a distinct factor shaping the overall factor structure.

This limitation is primarily related to the scope and reach of the participant selection. It is possible that stakeholders with more critical views were not included, either because they were less visible within the professional networks used for recruitment or because they were less inclined to participate in this study. In addition, actors who are most sceptical of the approach may not have been directly involved in two-phase projects, and therefore fell outside the immediate field of view of a study centred on hands-on project experience.

As a result, the findings may underrepresent more strongly critical or cost-focused viewpoints. While this does not undermine the internal consistency of the identified perspectives, it does limit the extent to which the study captures the full range of debate present in the broader field.

9.1.6. Dominance of Factor 1

The factor analysis produced a first factor with a relatively high eigenvalue, indicating a strong shared core across participants. This supports the conclusion that stakeholders broadly recognise a common set of characteristics of the two-phase procurement approach. At the same time, such dominance can make it harder for more marginal or strongly critical viewpoints to emerge as clearly separated factors, because they may remain statistically small or become absorbed into the shared core.

Differences between perspectives should therefore be interpreted against the background of this shared baseline. In other words, the results capture variation around a common understanding of the approach rather than sharply opposing positions.

9.1.7. Interpretation of Perspective 3

The interpretation of the third perspective is another limitation. This perspective is defined by only two Q-sorts, which reduces its empirical robustness compared to the other perspectives. Although the interpretation is grounded in distinguishing statements and supported by the follow-up interviews, alternative readings remain possible. Perspective 3 should therefore be treated as indicative rather than definitive, and future studies with larger samples or targeted recruitment of stakeholders who strongly identify with this view could strengthen the evidence base.

9.1.8. Time Sensitivity of the Research

Finally, this study captures stakeholder perceptions at a specific moment in time. Although the respondents involved are highly experienced professionals who are well able to reflect critically on procurement practices, their assessments are necessarily shaped by the current state of development of the two-phase procurement approach itself. The approach is still evolving and is applied in different forms across projects and organisations, with limited standardisation and learning effects across projects.

Several projects included in the study concerned early or pilot applications, meaning that respondents primarily draw on experiences from projects in which roles, incentives and governance arrangements were still being explored and adjusted. Even for experienced actors, this limits the extent to which longer-term effects, stabilised practices or cumulative learning can be fully anticipated or assessed. The findings should therefore be understood as a snapshot of how the approach is currently interpreted and enacted in practice, rather than as a definitive assessment of its mature or long-term effects.

9.2. Further Research

The findings of this study open up several opportunities for further research. While the analysis sheds light on how stakeholders interpret the two-phase procurement approach, it also highlights questions that extend beyond the scope of this study. The following directions point to opportunities for deepening, broadening and complementing the present findings through research.

9.2.1. Linking Stakeholder Perspectives to Project Outcomes

This study identifies distinct stakeholder perspectives that differ in how key characteristics of the two-phase procurement approach are valued, and in how trade-offs between cost, risk, control and collaboration are understood. While these perspectives provide insight into how stakeholders interpret the approach, this research does not exam-

ine whether these differences are reflected in actual project outcomes. It therefore remains unclear whether certain perspectives are associated with differences in cost development, risk occurrence, collaboration quality or execution stability.

Future research could build on this study by linking stakeholder perspectives to observable project outcomes. For example, perspectives identified through Q-methodology could be combined with case studies or quantitative project data to examine whether projects associated with particular perspectives show different patterns in costs, claims, variations or perceived performance. This could help clarify whether differences in interpretation remain mainly at the level of perception, or whether they are also reflected in project execution.

9.2.2. Innovation within the Two-phase Procurement Approach

The findings of this study suggest that the two-phase procurement approach is mainly experienced as a way to reduce uncertainty and increase predictability, rather than as a means to stimulate innovation. Across perspectives, considerable attention is given to risk identification, robust solutions and execution certainty. Innovation is often approached with caution, as it is seen as introducing additional uncertainty and potential cost increases. This points to a tension between policy ambitions that associate early collaboration with innovation and how the approach is applied in practice.

Further research could therefore examine under which conditions innovation does or does not emerge within the two-phase procurement approach. Such studies could focus on how project ambitions, governance arrangements, risk allocation and contractual choices influence the extent to which innovation is explored during Phase 1. Comparing projects with different levels of innovation could provide insight into how innovation is encouraged, limited or set aside within the two-phase context.

9.2.3. Cost Implications over the Project Life Cycle

Throughout this study, participants often described the two-phase procurement approach as more expensive, mainly due to higher costs incurred during Phase 1. At the same time, these early costs were frequently linked to increased predictability and fewer unexpected issues during execution. However, this study does not provide empirical evidence on how total project costs compare with those of more traditional procurement approaches, nor on whether higher upfront costs are offset by fewer claims, variations or risks later in the project.

Further research could therefore focus explicitly on the cost implications of the two-phase procurement approach over the full project life cycle. As more two-phase projects are completed, systematic comparisons with similar projects procured through other approaches could be conducted. Such research could examine not only total costs, but also when costs occur and how predictable they are, providing clearer insight into how the approach affects cost development in practice.

9.2.4. Capturing More Critical and Sceptical Perspectives

This study primarily captures perspectives of stakeholders who have direct experience with the two-phase procurement approach. As discussed earlier, more strongly critical or sceptical viewpoints, particularly those focusing on cost increases and financial justification, appear to be less prominently represented in the findings. This may be related to the selection of participants with hands-on project involvement, as well as to the relatively recent and evolving nature of the approach.

Future research could explicitly aim to capture these more critical perspectives by broadening the scope of participant selection. This could include stakeholders who have chosen not to apply the two-phase approach, who have discontinued its use, or who are involved in organisational, financial or policy-level decision-making rather than project execution.

10

Conclusion: A Meaningful but Demanding Approach

Over the past decades, Dutch infrastructure projects have been delivered through a range of contracting and procurement approaches, each with its own advantages and limitations. As projects became more complex and uncertain, the weaknesses of existing models became more apparent, manifesting in high failure costs, increasingly adversarial cliKent–contractor relationships, and a declining willingness of market parties to participate in projects. In response, public clients began to explore alternative forms, including the two-phase procurement approach. This approach was intended to involve market expertise earlier, manage risks and price development more carefully, improve predictability and reduce transaction costs, and support more collaborative ways of working, while also creating opportunities for learning across projects and innovation. Although the two-phase procurement approach is introduced with clear intentions, stakeholders differ in how they evaluate the trade-offs it entails and in whether these trade-offs are considered worthwhile in practice. These divergent perspectives make it relevant to examine how the approach is applied and perceived by those involved. Therefore, this study addresses the following main research question: *How do stakeholders in Dutch infrastructure projects perceive the two-phase procurement approach in relation to its intended objectives?*

Rather than redistributing formal responsibilities, the two-phase procurement approach reorganises the project process. Early involvement of the contractor, combined with deferred price formation, ensures that many risk and feasibility discussions are brought forward in time, when design choices are still flexible, rather than emerging during execution, when problems become visible and lead to high failure costs and adversarial relations.

In doing so, fragmentation between design and execution is reduced. This shift is widely appreciated, but it also places greater emphasis on fragmentation between the exploratory phase and the subsequent design phase. In turn, this may give rise to different forms of failure costs, which can materialise earlier in the process through Go/No-Go decisions and renewed adversarial relations.

Across perspectives, this reduction of fragmentation is seen as particularly effective in one main respect: it stabilises execution. Early involvement of contractor expertise improves buildability, reduces late design changes and limits disruptions during construction. This contribution to more predictable execution is consistently identified as the main strength of the two-phase procurement approach and explains its appeal in complex infrastructure projects.

However, this stabilised execution does not come without cost. Faced with the opportunity to reduce uncertainty

before construction starts, project teams tend to favour robust, low-risk solutions and to cover as much uncertainty as possible at an early stage. This risk-averse behaviour supports predictability, but it is sensitive to overshooting its purpose. It not only encourages conservative design choices, but also limits the exploration for innovative alternatives, as options that introduce additional uncertainty are less attractive when execution stability is prioritised. As a result, project costs rise during the design phase rather than materialising later through disruptions during execution. In effect, the public client pays a risk premium upfront.

In theory, the Go/No-Go decision is intended to act as a countervailing power to this upward cost pressure. By retaining the option to terminate the process, it should limit the contractor's bargaining power in a context where competition has effectively disappeared. In practice, however, the Go/No-Go moment offers limited influence. Sunk costs, time pressure and the desire to avoid restarting procurement make a No-Go decision politically and practically unattractive.

This dynamic significantly increases the demands placed on public client capability. To act as an effective countervailing power against risk-averse behaviour and contractor proposals, public clients must be able to critically assess, challenge and substantiate technical, financial and risk-related assumptions. This requires a level of substantive expertise that goes beyond the role played by public clients in earlier models. Rather than outsourcing detailed knowledge to the market, public clients need to (re)develop internal technical and cost-related capability in order to apply the two-phase procurement approach successfully.

In addition to stabilised execution, the approach offers a benefit in the form of an improved working culture. The transparency associated with this approach fosters a stronger sense of shared responsibility and greater trust between parties, which in turn contributes to a more positive and cooperative working environment. This makes the approach particularly attractive in a context where capacity is scarce, as it may contribute to making project work in the sector more appealing. However, whether this translates into a lasting cultural change remains uncertain. The improved working culture is conditional and context-dependent. When costs rise sharply or uncertainty remains high, control-oriented behaviour and defensive positions tend to return. In this sense, the two-phase procurement approach appears to suppress adversarial dynamics under favourable conditions, which tend to re-emerge once relationships come under pressure.

This conditionality helps explain why the approach relies heavily on behavioural and relational qualities such as professional trust, open and effective communication, and the ability to look beyond organisational interests. When these qualities are absent, the risk of reverting to familiar, adversarial patterns increases.

This risk is further reinforced by the redistribution of transaction costs within the two-phase procurement approach. Tendering effort and related costs for contractors decrease, while preparatory effort and costs increase for public clients. In itself, this redistribution is not problematic. It becomes more contentious, however, when reduced market exposure for contractors is combined with pressure for high profit margins. In such situations, public clients bear higher upfront effort and risk premiums, while contractors benefit simultaneously from lower transaction costs and greater financial certainty. Under these circumstances, the approach becomes increasingly difficult for public clients to justify.

Overall, directly involved stakeholders are broadly positive about the two-phase procurement approach, but they value it for different reasons and place emphasis on different trade-offs. The three identified perspectives reflect variations in how stakeholders judge whether the benefits of the approach outweigh its costs and demands. One perspective primarily values transparency, mutual trust and shared responsibility, and regards higher upfront costs as justified investments in collaboration and smoother execution. A second perspective places greater emphasis on the capability of the public client, stressing that the approach only functions effectively when clients are able to actively assess, challenge and steer early cost and risk decisions; without this capability, transparency may increase

uncertainty rather than control. A third perspective values the execution stability achieved through early contractor involvement, but is more critical about reduced bargaining power, upward cost pressure and the limited practical strength of the Go/No-Go decision as a corrective mechanism.

These findings imply that the two-phase procurement approach cannot and should not be applied without careful consideration. Its effectiveness depends on a set of demanding conditions, including sufficient countervailing power on the client side, the presence of behavioural and relational qualities among key stakeholders, adequate space for contractor input to meaningfully inform early decisions, and restraint in contractor profit expectations in line with the reduced risk profile. Where these conditions are not met, the approach is likely to generate friction. In such cases, the risk premium paid for stabilised execution and an improved working environment may no longer be justified, particularly when the approach is applied across a broader portfolio of projects. The greater the scale of application, the more these conditions become binding. As a result, the two-phase procurement approach is most defensible in projects characterised by substantial uncertainty and complexity, where early risk reduction genuinely outweighs the associated investments.

Finally, this study concludes that the two-phase procurement approach represents a meaningful but demanding step towards more collaborative and predictable infrastructure delivery. Whether it leads to better outcomes depends less on the procurement model itself than on how consciously it is enacted in practice. The approach requires a different posture from both public clients and contractors, each of whom plays a critical role in shaping its effects. The potential for a successful transition is evident, but it will only materialise if both public clients and contractors actively commit to their shared responsibilities.

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A

Procurement Explained

Procurement in Infrastructure Projects

Public procurement is the mechanism through which Dutch authorities contract out infrastructure works. It determines when and how the market is engaged, under what procedures, and based on which award criteria. The chosen procurement route is not isolated: it is closely tied to the project delivery model (bouworganisatievorm) that is selected. Project delivery models define what is being procured, whether this concerns only execution, or an integrated package of design, build, finance, and maintenance. In this thesis, procurement is defined as a structured method of purchasing, aimed at contracting the most suitable partner to deliver a specified work, service, or product, under conditions that ensure value for money by balancing price and quality (PIANOo, n.d.-e).

A.0.1. Procurement Procedures in the Netherlands

The Dutch procurement framework is governed by European Directive 2014/24/EU (The European Parliament and the European Council, 2014) on public procurement, transposed into national law through the Aanbestedingswet 2012 (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2012). For works below the European thresholds, Dutch practice is further guided by the Aanbestedingsreglement Werken (PIANOo, 2020) and the Gids Proportionaliteit ("Gids Proportionaliteit: 3e herziening", 2022). Together, these sources define which procedures apply at different contract values.

- **Single-source negotiated procedure**: For very small assignments (typically below €150,000 for works; €50,000 for supplies or services), the client may invite a single contractor.
- **Multi-source negotiated procedure**: For somewhat larger assignments, usually up to €1.5 million for works, three to five contractors are invited to submit an offer.
- **National procedure**: Required for projects above the national thresholds but below the EU thresholds. These tenders are advertised on TenderNed and open to national competition.
- **European procurement**: Mandatory for projects above the EU thresholds (currently €5,538,000 for works, lower for supplies and services). The Ministerie van Binnenlandse Zaken en Koninkrijksrelaties (2012) prescribes the use of the European procedures: the open procedure, the restricted procedure, the competitive procedure with negotiation, the competitive dialogue, and the innovation partnership .

- **Negotiated procedure without prior publication**: This exceptional procedure may only be used under strict conditions, such as extreme urgency, technical exclusivity, or when previous tenders have failed to produce suitable offers.

A.0.2. Award Principles and Evaluation

Whereas procurement procedures determine *how* and *when* the market is approached, award principles specify *on what basis* contracts are actually granted. The Dutch procurement framework, following Directive 2014/24/EU and the Aanbestedingswet 2012, allows three types of award criteria: (i) lowest price, (ii) lowest cost on the basis of cost-effectiveness (including life-cycle costing), and (iii) the best price–quality ratio (BPKV, from the Dutch beste prijs-kwaliteitverhouding) (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2012).

In practice, BPKV — also known as *economisch meest voordelige inschrijving* (EMVI) — has become the prevailing principle. Since 2016, Dutch policy has explicitly adopted the rule of *"BPKV, unless"*, meaning that lowest-price awards are only allowed if the contracting authority can provide a clear justification for not applying quality criteria (PIANOo, n.d.-c). This shift was introduced to move away from exclusive reliance on price, which had often encouraged opportunistic bidding and resulted in disputes, cost overruns, and strained client–contractor relationships.

Under BPKV, bids are evaluated not only on price but also on qualitative dimensions such as risk management, sustainability, stakeholder involvement, team competence, and innovation. For complex projects, major public clients such as Rijkswaterstaat increasingly prioritise these qualitative factors, and in some cases even apply a 100% quality weighting in the initial selection stage, with price introduced only after critical uncertainties have been resolved.

B

Sources Concourse

Table 15: Overview of ECI Literature used for Deriving Statements

Reference	Goals of the source
Atkinson et al., 2023	Examines how collaborative procurement models such as ECI can improve project performance and address inefficiencies in the UK construction sector.
Eadie and Graham, 2014	Identifies the advantages and potential barriers of Early Contractor Involvement, focusing on improving collaboration and constructability in public works.
Finnie et al., 2019	Analyses lessons from two-stage ECI projects in New Zealand, highlighting practical challenges in pricing, collaboration, and risk sharing.
Finnie and Smith, 2021	Presents a case study of a two-stage ECI process for seismic upgrades at Queenstown Airport, demonstrating benefits of early contractor input.
Friedinger and Sander, 2024	Develops a decision-support tool to help public clients assess when and how to apply ECI for improved project outcomes.
Hällström and Bosch-Sijtsema, 2019	Provides a preliminary literature review on ECI, exploring how collaborative project delivery models influence actor roles and integration.
Ishtiaque, Malvik, et al., 2025	Evaluates the role of ECI in delivering sustainable building projects, linking early collaboration to environmental performance.
Ishtiaque, Wondimu, and Klakegg, 2025	Compares perceived benefits of ECI in infrastructure versus building projects from a client perspective.
Ishtiaque, Wondimu, Memic, et al., 2025	Ranks the expected benefits of ECI using survey data from clients and contractors to prioritise value-adding factors.
Lenferink et al., 2012	Discusses early contractor involvement in Dutch infrastructure projects and evaluates initial experiences with parallel procurement procedures.
Laryea and Watermeyer, 2016	Investigates the integration of ECI principles in framework agreements to enhance efficiency and reduce transaction costs.

Reference	Goals of the source
Malvik et al., 2021	Compares alternative approaches to ECI in relational contracts, identifying enabling factors for effective collaboration.
Rahman and Alhassan, 2012	Examines contractors' perceptions of ECI benefits and challenges, including trust, transparency, and risk sharing.
Saunders et al., 2024	Compares productivity and work-hour efficiency between traditional tendering and ECI projects.
Sheamar et al., 2024	Investigates how new procurement models such as ECI can mitigate cost overruns from the contractor's perspective.
Song et al., 2009	Analyses the impact of early contractor involvement in design on construction schedule performance.
Wondimu, Hosseini, et al., 2016	Identifies success factors for implementing ECI in public infrastructure projects and aligns them with EU procurement directives.
Wondimu, Hailemichael, et al., 2016	Compares different ECI implementation strategies and their implications for client–contractor collaboration in Norway.

Table 16: Overview of Dutch Two-phase Procurement Approach Literature used for Deriving Statements

Reference	Goals of the source
De Groot and Gieske, 2025	Examines how Rijkswaterstaat used action learning to develop and embed the approach.
C. E. C. Jansen, 2021	Explains why fixed-price integrated contracts struggle and shows how the approach enables early contractor involvement lawfully.
Ter Maten et al., 2022	Shows how innovative procurement and early collaboration enabled an optimal renovation strategy for the Nijkerker bridge.

Table 17: Overview of Media and Public Discourse used for Deriving Statements

Reference	Goals of the source
Arends, Meer, et al., 2017	Synthesises sector perspectives to illustrate how the Dutch "Marktvisie" is being implemented in water-infrastructure projects.
Bleeker and Den Houting, 2020	Analyses, in podcast form, how the approach operates by separating collaborative design and risk assessment from later price formation.
Dijkwerkers Werken Door, 2020	Discusses in podcast form how the approach is applied in Dutch flood-defence projects.
Gebouwd, 2020	Analyses Rijkswaterstaat's early approach pilots.
Koenen, 2019	Argues that in the approach the financial bid should not influence the award decision.
Kwaak, 2022	Explains the growing use of the approach in Dutch infrastructure projects.

Reference	Goals of the source
Van Belzen, 2024	Explains in podcast form how early collaboration enabled fair risk allocation and successful delivery of the Pannerdensch Kanaal project.

Table 18: Overview of Policy and Professional Documents used for Deriving Statements

Reference	Goals of the source
Boogaard, 2021	Explores the behavioural and organisational dynamics of the approach.
Bosch, 2023	Evaluates the draft Rijkswaterstaat guidance on the approach.
Brodies, 2020	Explains how the approach allows contractors to manage cost and insolvency risks by engaging early under a pre-construction agreement.
Cabinet Office UK, 2014	Provides UK guidance showing how Two Stage Open Book procurement and collaborative supply-chain working can cut costs and improve value.
Chao-Duivis, 2019	Argues that integrated contracts demand unrealistic early pricing under high uncertainty and explains why this calls for the approach.
de Rooij et al., 2025	Identifies best practices for embedding the approach in contract documents.
Eque2, 2016	Aims to show how the approach reduces project risk through early contractor input, clearer cost planning and better-informed decisions.
Fijneman and CROW, 2020	Provides practical guidance for public clients on how to procure the approach.
HDP Consult, 2018	Explains the advantages and disadvantages of the approach.
Heemskerk et al., 2024	Shows, via the Stadsdijken Zwolle case, that the approach can reduce financial risk and improve cost predictability.
C. Jansen, 2019	Explains why the approach emerged in the Netherlands and how it addresses systemic risks in other procurement models.
Ministerie van Infrastructuur en Waterstaat, 2015	Shows how the Nijkerkerbrug pilot enabled Rijkswaterstaat and partners to develop a simpler, more collaborative procurement approach.
Ministerie van Infrastructuur en Waterstaat, 2019	Explains how Rijkswaterstaat uses the DOEN-method to simplify procurement and strengthen collaboration through early dialogue.
Ministerie van Infrastructuur en Waterstaat, 2023	Presents the aim of Rijkswaterstaat's Community of Practice to collect lessons from the approach pilots and develop shared guidance.
Mobilis TBI, 2025	Shows how Mobilis applies the approach in practice and distils lessons, benefits and pitfalls to support sector-wide learning.
PIANOo, n.d.-d	Shows how the approach supports the circular ambitions of It Swettehus by enabling early collaboration and joint exploration of reuse options.
Van der Hoeven, 2020	Explains how separating design development from final price formation in the approach improves cooperation and reduces bidder uncertainty.
Van Netten, 2024	Discusses three common pitfalls in the use of the approach.

C

Concourse: Collected Statements

Table 19: Statements about Capability

Capability	
Statement	**Source**
Improves supply chain management.	Atkinson et al., 2023
Captures client requirements more accurately.	Atkinson et al., 2023
Improves decision-making.	Atkinson et al., 2023
Strengthens market position through a proven track record.	Atkinson et al., 2023
Improves decision-making.	Atkinson et al., 2023
Increases in-house knowledge within the project organisation.	Eadie and Graham, 2014
Improves the quality of design solutions through contractor expertise.	Eadie and Graham, 2014
Increases efficiency during construction through early project knowledge.	Eadie and Graham, 2014
Enables more effective programme management throughout the project lifecycle.	Eadie and Graham, 2014
Improves planning and allocation of resources through early detailed design.	Eadie and Graham, 2014
Leads contractors to prioritise the execution phase and future work once selected.	Finnie et al., 2019
Encourages contractors to explore too many options without clear focus.	Finnie et al., 2019
Suffers from poor design documentation remaining the main problem.	Finnie et al., 2019
Should reduce claims, but limited contractor maturity prevents these benefits.	Finnie et al., 2019
Underperforms when contractors do not understand the different way of working it requires.	Finnie et al., 2019
Lacks clear process guidance and documentation, leaving teams to find their own way.	Finnie et al., 2019
Leaves client expectations unmet and responsibilities undefined due to unclear procedures.	Finnie et al., 2019
Leaves obligations and expectations unclear because of missing pre-construction documentation.	Finnie et al., 2019
Undermines effectiveness when design coordination quality declines.	Finnie et al., 2019
Proves valuable in overheated markets where construction capacity is limited.	Finnie and Smith, 2021
Leaves clients uncertain about what they are purchasing due to the lack of a formal structure.	Finnie and Smith, 2021
Faces challenges due to the absence of clear guidelines and contract documentation.	Finnie and Smith, 2021
Makes involving key supply chain partners in planning and execution too demanding and complex for public clients.	Friedinger and Sander, 2024
Requires clients to have sufficient competence and capacity to manage the process effectively.	Friedinger and Sander, 2024
Suffers when contracts lack clarity about roles and responsibilities.	Ishtiaque, Malvik, et al., 2025
Depends largely on the client's flexibility for successful outcomes.	Ishtiaque, Malvik, et al., 2025
Improves constructability through contractor input during design.	Ishtiaque, Wondimu, and Klakegg, 2025
Reduces design changes, defects and rework through contractor involvement in design.	Ishtiaque, Wondimu, and Klakegg, 2025
Lacks a clear definition, limiting consistent application in practice.	Ishtiaque, Wondimu, Memic, et al., 2025
Improves the quality of design and construction solutions.	Ishtiaque, Wondimu, Memic, et al., 2025
Improves constructability through early integration of contractor expertise.	Ishtiaque, Wondimu, Memic, et al., 2025

Capability	
Statement	**Source**
Reduces design and scope changes during construction.	Ishtiaque, Wondimu, Memic, et al., 2025
Improves constructability and solution quality as key perceived benefits.	Ishtiaque, Wondimu, Memic, et al., 2025
Benefits from the contractor's practical experience in design.	Laryea and Watermeyer, 2016
Improves drawing quality, material supply and information flow.	Laryea and Watermeyer, 2016
Ensures optimal buildability during the design phase.	Laryea and Watermeyer, 2016
Improves planning and allocation of resources.	Laryea and Watermeyer, 2016
Improves consideration of buildability during design.	Laryea and Watermeyer, 2016
Increases attention to health and safety factors.	Laryea and Watermeyer, 2016
Requires flexible designers open to contractor input.	Laryea and Watermeyer, 2016
Helps contractors improve cost, quality, buildability and maintenance.	Laryea and Watermeyer, 2016
Depends on the contractor's skills and experience for successful results.	Laryea and Watermeyer, 2016
Requires a flexible and capable design team.	Laryea and Watermeyer, 2016
Relies on an intelligent and competent client for successful implementation.	Laryea and Watermeyer, 2016
Reduces design errors and failures.	Rahman and Alhassan, 2012
Improves design review and constructability.	Rahman and Alhassan, 2012
Enhances project control, contract management and decision-making.	Rahman and Alhassan, 2012
Reduces accidents and improves safety.	Rahman and Alhassan, 2012
Is hindered by inadequate training and limited experience.	Rahman and Alhassan, 2012
Is undermined by time pressure, conflicts of interest and limited management engagement.	Rahman and Alhassan, 2012
Slows down due to bureaucracy and lack of leadership.	Rahman and Alhassan, 2012
Limits continuous improvement when technical knowledge is lacking.	Rahman and Alhassan, 2012
Depends on sufficient resources and reliable information sharing between parties for successful application.	Saunders et al., 2024
Suffers when clients lack knowledge, leading to cost escalation in procurement.	Sheamar et al., 2024
Challenges public clients due to regulations requiring competitive and transparent team selection.	Wondimu, Hailemichael, et al., 2016
Requires public clients to assess both price and quality early to comply with EU directives.	Wondimu, Hailemichael, et al., 2016
Depends on client competence and experience with procurement procedures for project success.	Wondimu, Hailemichael, et al., 2016
Requires clients to understand what they order and expect, even when design risks are transferred.	Wondimu, Hailemichael, et al., 2016
Is hindered because public clients lack sufficient knowledge to properly assess cost estimates.	Wondimu, Hailemichael, et al., 2016
Relies on contractor qualifications to determine the quality of results.	Wondimu, Hailemichael, et al., 2016
Requires continuity of key project staff, which is essential but difficult to maintain.	Cabinet Office UK, 2014
Fails to reach its full potential because public clients lack the capacity to (co-)design, safeguard quality and control costs.	Chao-Duivis, 2019
Enables clients to design tender rules that encourage desired behaviour among participants.	Heemskerk et al., 2024
Improves continuity and understanding across project phases by integrating execution knowledge into planning.	Van Belzen, 2024
Makes the transition from planning to execution one of the most challenging project moments.	Van Belzen, 2024
Requires retaining knowledge within the project team to function well.	Van Belzen, 2024
Places high demands on contractors in terms of knowledge, capacity and collaboration.	Dijkwerkers Werken Door, 2020
Defines the project brief clearly to enable better proposals and more realistic pricing.	Dijkwerkers Werken Door, 2020
Transfers lessons learned so others in the organisation can benefit.	De Groot and Gieske, 2025
Strengthens learning when project teams define their own goals.	De Groot and Gieske, 2025
Sets learning goals that go beyond project needs and strengthen the organisation.	De Groot and Gieske, 2025
Pushes learning to the background due to project pressure and lack of time.	De Groot and Gieske, 2025
Requires project leaders to manage less to stay in control.	De Groot and Gieske, 2025
Fills short-term gaps by hiring external staff but causes long-term knowledge loss.	De Groot and Gieske, 2025
Retains internal knowledge when key roles remain within the organisation.	De Groot and Gieske, 2025
Gives learning a secondary role under project time pressure.	De Groot and Gieske, 2025
Produces final design documents aimed at political approval rather than execution quality.	Boogaard, 2021
Works less effectively because attitudes and behaviours do not change in practice.	Mobilis TBI, 2025
Challenges clients with limited resources to keep pace with contractors.	Mobilis TBI, 2025
Brings valuable expertise by involving the contractor in design.	Eque2, 2016
Leaves legal obligations unclear before the final contract.	Eque2, 2016
Uses contractor know-how in design to improve choices.	Kwaak, 2022
Requires clear evaluation criteria so all know when a bid is strategic.	Van der Hoeven, 2020
Makes lower-complexity projects generally more manageable.	Ministerie van Infrastructuur en Waterstaat, 2023

Capability	
Statement	**Source**
Builds familiarity over time to strengthen relationships and improve efficiency.	Designing Buildings, n.d.
Selects partners based on cooperation skills, action plans and client insight.	Ter Maten et al., 2022
Combines market and client technical expertise through collaboration.	Ter Maten et al., 2022
Develops technical solutions by leveraging multiple experts.	Ter Maten et al., 2022
Creates imbalance when client capacity in the design phase is insufficient.	Van Netten, 2024

Statements Capability

Table 19 presents the statements related to the Capability theme. In total, 89 statements were identified within this theme.

The statements largely focus on the knowledge, skills, and organisational capacity required to make the two-phase procurement approach work in practice. Many statements emphasise the use of contractor expertise during the design phase and its effects on constructability, design quality, and decision-making. Capability is frequently framed as a key enabler for reducing design changes, improving buildability, and strengthening control over the project.

A second recurring topic concerns the demands placed on public clients, particularly with respect to competence, capacity, and the ability to assess designs, procedures, and cost estimates. Several statements highlight the importance of clear roles, responsibilities, and guidance, while others point to challenges arising from unclear processes, limited experience, or insufficient documentation.

In addition, a set of statements addresses organisational learning and continuity, such as retaining knowledge within project teams, managing staff turnover, and balancing short-term project pressure with long-term capability development. Overall, the Capability statements reflect both enabling and constraining aspects of the two-phase procurement approach and show substantial variation in how capability-related issues are discussed within the discourse.

Table 20: Statements about Collaboration

Collaboration	
Statement	**Source**
Increases satisfaction among stakeholders.	Atkinson et al., 2023
Solves problems faster and more effectively.	Atkinson et al., 2023
Reduces disputes and enables quicker resolution.	Atkinson et al., 2023
Builds long-term relationships.	Atkinson et al., 2023
Improves communication.	Atkinson et al., 2023
Reduces disputes and accelerates conflict resolution.	Atkinson et al., 2023
Benefits clients by involving contractors in landowner negotiations.	Eadie and Graham, 2014
Improves stakeholder relations and public communication.	Eadie and Graham, 2014
Reduces commercial tension between parties through early collaboration.	Eadie and Graham, 2014
Suits projects that aim to build long-term relationships between client and contractor.	Finnie and Smith, 2021
Creates a collegial and collaborative dynamic within the project team.	Finnie and Smith, 2021
Establishes a positive working relationship from the start.	Finnie and Smith, 2021
Reduces disputes and the need for supplementary project management.	Friedinger and Sander, 2024
Undermines collaboration when a shared team culture is missing or parties are not fully committed.	Hällström and Bosch-Sijtsema, 2019
Brings all parties closer together and improves mutual understanding during the collaborative phase.	Ishtiaque, Malvik, et al., 2025
Reduces conflict levels, one of the key motivations for using this method.	Ishtiaque, Malvik, et al., 2025
Keeps conflict levels low throughout the project due to early collaboration.	Ishtiaque, Malvik, et al., 2025
Reduces conflict because stakeholders understand each other's interests from the start.	Ishtiaque, Malvik, et al., 2025
Reduces adversarial behaviour between partners through cost transparency.	Ishtiaque, Wondimu, and Klakegg, 2025
Bases collaboration on shared interests rather than conflicting stakeholder priorities.	Ishtiaque, Wondimu, Memic, et al., 2025

Collaboration	
Statement	**Source**
Positions the contractor as a partner instead of a competitor.	Ishtiaque, Wondimu, Memic, et al., 2025
Increases transparency throughout the project process.	Ishtiaque, Wondimu, Memic, et al., 2025
Improves collaboration between all project participants.	Ishtiaque, Wondimu, Memic, et al., 2025
Makes collaboration the most valued benefit for clients.	Ishtiaque, Wondimu, Memic, et al., 2025
Shortens construction time through closer relationships between project partners.	Laryea and Watermeyer, 2016
Fosters a cooperative relationship between client and contractor.	Laryea and Watermeyer, 2016
Risks exposing company secrets when sharing sensitive information.	Laryea and Watermeyer, 2016
Optimises design to meet client requirements and strengthens partnerships through gain-share mechanisms.	Laryea and Watermeyer, 2016
Promotes intensive exchange of ideas.	Lenferink et al., 2012
Involves contractors to strengthen collaboration and reduce risk.	Malvik et al., 2021
Encourages a team mindset and a more integrated supply chain.	Rahman and Alhassan, 2012
Increases understanding and strengthens relationships.	Rahman and Alhassan, 2012
Reduces disputes between parties.	Rahman and Alhassan, 2012
Enhances coordination among project partners.	Rahman and Alhassan, 2012
Increases the satisfaction of both the public client and the contractor.	Rahman and Alhassan, 2012
Builds stronger trust between project partners.	Rahman and Alhassan, 2012
Fails without continuous, open and honest communication.	Rahman and Alhassan, 2012
Helps eliminate assumptions and clarify responsibilities through early contractor involvement.	Sheamar et al., 2024
Builds trust between the public client and the contractor through cost transparency.	Sheamar et al., 2024
Increases contractor willingness to work transparently when repeat work or long-term relationships are expected.	Sheamar et al., 2024
Encourages fair treatment and compensation of contractors to support knowledge sharing.	Wondimu, Hailemichael, et al., 2016
Relies on mutual trust between client and contractor for successful collaboration.	Wondimu, Hailemichael, et al., 2016
Depends on timely contractor involvement for success.	Wondimu, Hailemichael, et al., 2016
Depends on mutual trust between client and contractor for project success.	Wondimu, Hailemichael, et al., 2016
Depends on the contractor's willingness to propose optimisation ideas and the client's openness to accept them.	Wondimu, Hosseini, et al., 2016
Becomes limited when contractor options are restricted and involvement starts too late.	Wondimu, Hosseini, et al., 2016
Should include specialist contractors as well as main contractors in implementation.	Wondimu, Hosseini, et al., 2016
Promotes knowledge sharing during preconstruction and focuses on reducing unnecessary cost and risk.	Cabinet Office UK, 2014
Delivers time savings rather than delays through early collaboration.	Cabinet Office UK, 2014
Offers straightforward and easy-to-apply collaboration models.	Cabinet Office UK, 2014
Hinders open collaboration through formal control mechanisms.	Fijneman and CROW, 2020
Fails to deliver results when collaboration does not develop.	Fijneman and CROW, 2020
Needs open dialogue between client and contractor to discuss and allocate risks effectively.	Van Belzen, 2024
Makes risk discussions in the planning phase tense but essential for mutual understanding.	Van Belzen, 2024
Depends on trust and openness between project partners to ensure risk transparency.	Van Belzen, 2024
Benefits from constructive disagreement to maintain balance and quality in decision-making.	Van Belzen, 2024
Strengthens long-term collaboration through knowledge transfer between planning and execution phases.	Van Belzen, 2024
Becomes vulnerable when early agreements or promises are not maintained later in the process.	Van Belzen, 2024
Lowers overall societal costs through more efficient collaboration.	Dijkwerkers Werken Door, 2020
Shows a willingness from both client and contractor teams to learn and improve together.	De Groot and Gieske, 2025
Keeps project teams open to sharing experiences.	De Groot and Gieske, 2025
Prefers face-to-face knowledge sharing because written documents get lost or misinterpreted.	De Groot and Gieske, 2025
Promotes long-term collaboration between the public client and the contractor.	Arends, Meer, et al., 2017
Seeks equality in collaboration, though the client ultimately decides.	Boogaard, 2021
Recognises the need to balance individual and project interests between parties.	de Rooij et al., 2025
Lets clients benefit most from market knowledge and interaction.	Mobilis TBI, 2025
Improves communication and reduces misunderstandings through early collaboration.	Mobilis TBI, 2025
Builds trust and improves teamwork through open communication.	Mobilis TBI, 2025
Depends strongly on collaboration quality for project success.	Mobilis TBI, 2025
Strengthens continuity from design to execution through contractor involvement.	Kwaak, 2022
Helps parties understand each other's interests better.	PIANOo, n.d.-d
Improves efficiency, quality and job satisfaction through mixed teams.	Gebouwd, 2020
Centres collaboration on shared project goals rather than costs.	Ministerie van Infrastructuur en Waterstaat, 2023
Builds more collaborative project teams.	HDP Consult, 2018

Collaboration	
Statement	**Source**
Improves integration between design and delivery.	Brodies, 2020
Involves the contractor early to enhance buildability, cost certainty and integration while reducing disputes.	Designing Buildings, n.d.
Builds equality and shared knowledge from the start for faster delivery.	Ministerie van Infrastructuur en Waterstaat, 2019
Blurs the client–contractor boundary to foster genuine collaboration.	Ministerie van Infrastructuur en Waterstaat, 2019
Strengthens mutual understanding by working as one team.	Ministerie van Infrastructuur en Waterstaat, 2019
Weakens the commitment of the public client and the contractor due to the presence of the Go/No-Go moment.	"Community of Practice Rijkswaterstaat tweefasenaanpak", 2025

Statements Collaboration

Table 20 presents the statements related to the Collaboration theme. In total, 80 statements were identified within this theme.

The statements largely focus on how early collaboration between public clients and contractors affects relationships, communication, and trust. Many statements emphasise reduced conflict, faster problem-solving, improved mutual understanding, and higher satisfaction among project participants. Collaboration is frequently framed as a mechanism for building long-term relationships and establishing a positive working dynamic from the early project phases onward.

A second recurring topic concerns transparency and openness, particularly in relation to cost information, risk discussions, and shared decision-making. Several statements highlight trust as a key condition for successful collaboration, while others point to vulnerabilities when openness is limited, commitments are not upheld, or formal control mechanisms restrict interaction.

In addition, a smaller set of statements addresses potential limitations of collaboration, such as risks related to information sharing, unequal decision-making power, or reduced commitment due to the presence of a Go/No-Go moment. Overall, the Collaboration statements reflect both the expected benefits and the conditions under which collaborative working relationships may weaken in practice.

Table 21: Statements about Culture

Culture	
Statement	**Source**
Increases knowledge sharing.	Atkinson et al., 2023
Lacks a learning culture, which hinders the implementation of collaboration.	Atkinson et al., 2023
Lacks a training culture, resulting in insufficient competence to apply collaborative working.	Atkinson et al., 2023
Faces difficulties achieving shared goals due to differing mindsets and limited mutual understanding.	Atkinson et al., 2023
Lacks a culture of trust between contracting parties, undermining collaboration.	Atkinson et al., 2023
Focuses contractor input on self-protection rather than delivering real value.	Finnie et al., 2019
Suffers when cultural differences between partners hinder a successful design and construction process.	Hällström and Bosch-Sijtsema, 2019
Faces limited adoption due to unequal commitment and lack of a win-win attitude between parties.	Ishtiaque, Wondimu, Memic, et al., 2025
Suffers when client expectations and contractor performance are misaligned.	Ishtiaque, Wondimu, Memic, et al., 2025
Suffers when commitment between parties is unequal.	Laryea and Watermeyer, 2016
Requires a cultural shift that some professionals find challenging.	Laryea and Watermeyer, 2016
Encourages professionals to focus on quality rather than fault-finding.	Laryea and Watermeyer, 2016
Promotes mutual learning and knowledge sharing.	Rahman and Alhassan, 2012
Suffers from a lack of win-win attitude or shared goals.	Rahman and Alhassan, 2012
May fail due to insufficient commitment.	Rahman and Alhassan, 2012
Is obstructed by cultural or attitudinal differences.	Rahman and Alhassan, 2012
Loses trust through lack of understanding and unwillingness to compromise.	Rahman and Alhassan, 2012
Suffers when trust is low and fear of the unknown dominates.	Rahman and Alhassan, 2012
Is disrupted by personal conflicts and egos.	Rahman and Alhassan, 2012
Still experiences adversarial relationships.	Rahman and Alhassan, 2012
Faces cultural barriers when clients expect unrealistically low contractor profit margins.	Sheamar et al., 2024
Reduces conflicts over responsibility through a no-blame culture.	Sheamar et al., 2024
Promotes openness and shared learning from both success and failure.	Sheamar et al., 2024
Encounters resistance to cultural change, which remains the biggest barrier to implementation.	Song et al., 2009
Appears new in form but follows principles similar to traditional models.	Chao-Duivis, 2019
Undermines trust when design ambitions and final pricing are misaligned.	Fijneman and CROW, 2020
Motivates professionals to exceed formal requirements through pride and commitment in collaborative settings.	Heemskerk et al., 2024
Contributes to a healthier and more resilient construction sector.	Van Belzen, 2024
Creates a more positive, motivating and safe project culture.	Van Belzen, 2024
Lacks a clear legal and administrative framework for consistent application.	C. E. C. Jansen, 2021
Rewards preventing mistakes rather than correcting them.	C. Jansen, 2019
Promotes cooperation instead of adversarial relationships.	C. Jansen, 2019
Requires people who are open to change and experimentation.	De Groot and Gieske, 2025
Relies on the motivation to learn and experiment among people involved in two-phase projects.	De Groot and Gieske, 2025
Creates resistance when learning assignments are steered too tightly.	De Groot and Gieske, 2025
Balances contribution to organisational goals with freedom in learning and working.	De Groot and Gieske, 2025
Focuses too much on contracts and rules and too little on people.	De Groot and Gieske, 2025
Requires more than a single presentation to change team mindsets.	De Groot and Gieske, 2025
Suffers when a risk-averse culture dominates organisations.	De Groot and Gieske, 2025
Reflects a strong urge for control within project organisations.	De Groot and Gieske, 2025
Increases fear of failure when project costs are high.	De Groot and Gieske, 2025
Considers documentation of knowledge unnecessary or unrealistic.	De Groot and Gieske, 2025
Balances tension between top-down and bottom-up learning needs.	De Groot and Gieske, 2025
Treats negative outcomes of experiments as failures instead of learning opportunities.	De Groot and Gieske, 2025
Rewards problem-solving more than structured learning.	De Groot and Gieske, 2025
Limits organisational learning through standardisation and risk aversion.	De Groot and Gieske, 2025
Faces issues that are often behavioural rather than procedural.	Arends, Meer, et al., 2017
Requires both clients and contractors to be willing to change their behaviour.	Arends, Meer, et al., 2017
Should make early collaboration between clients and contractors second nature to improve sector performance.	Arends, Meer, et al., 2017
Aims for equality between public and private partners but struggles to maintain it when conflicts arise.	Boogaard, 2021
Causes disappointment between phases due to differing mindsets, approaches and expectations.	Boogaard, 2021
Makes the paradox of unequal equality between client and contractor more visible as projects progress.	Boogaard, 2021
Continues to convey a strong us–them mentality.	Bosch, 2023

Culture	
Statement	**Source**
Persists “us versus them” mindset because of the continued preference for UAV-GC.	Bosch, 2023
Is driven by both commercial and political interests.	Bosch, 2023
Is a cure-all for the McKinsey findings.	Bosch, 2023
Faces its biggest risks in distrust and a “we–they” culture.	Mobilis TBI, 2025
Gives people space and freedom to focus on content through a simple, well-balanced contract.	Mobilis TBI, 2025
Suffers from lack of trust, leading to misunderstandings, conflict and delay.	Mobilis TBI, 2025
Arises from growing regulatory pressure driving new collaboration forms.	Ministerie van Infrastructuur en Waterstaat, 2015
Reflects an ongoing cultural shift within the construction industry.	Ministerie van Infrastructuur en Waterstaat, 2015
Requires an open mindset to succeed.	Ministerie van Infrastructuur en Waterstaat, 2015
Does not solve major project problems entirely but represents progress.	Kwaak, 2022
Relies on mutual respect as the basis for successful collaboration.	Gebouwd, 2020
Bases successful collaboration on fairness and reciprocity.	Ministerie van Infrastructuur en Waterstaat, 2023
Enables open dialogue about fair pay and shared value.	Ministerie van Infrastructuur en Waterstaat, 2023
Creates entry barriers for new suppliers not meeting shortlisting criteria.	HDP Consult, 2018
Promotes transparency by reducing paperwork and rules.	Ministerie van Infrastructuur en Waterstaat, 2019
Provides room to deviate from procedures and pursue shared goals such as fair pay and customer value.	Ter Maten et al., 2022
Undermines the original intent of expertise-based collaboration.	Van Netten, 2024
Risks turning design into a pressure tool where time and cost constraints limit open decision-making.	Van Netten, 2024
Creates a fair process with less room for noise and misunderstanding.	Koenen, 2019
	Koenen, 2019
Leads to collaboration training placing collaboration too strictly into roles and procedures.	Koenen, 2019

Statements Culture

Table 21 presents the statements related to the Culture theme. In total, 73 statements were identified within this theme.

The statements largely focus on cultural and behavioural aspects that shape how the two-phase procurement approach functions in practice. Many statements address trust, openness, commitment, and willingness to collaborate, often framing these as essential conditions for successful implementation. Cultural change is frequently described as necessary but difficult, with several statements pointing to resistance, entrenched routines, and persistent adversarial mindsets.

A second recurring topic concerns learning, knowledge sharing, and attitudes toward experimentation and failure. Several statements highlight the importance of a learning culture that allows for reflection, adaptation, and shared learning, while others note that time pressure, risk aversion, and control-oriented practices tend to push learning to the background.

In addition, a number of statements emphasise tensions related to equality, fairness, and power dynamics between public clients and contractors. These include references to unequal commitment, mismatched expectations between phases, and the continued presence of an “us–them” mentality. Overall, the Culture statements capture both aspirational views on collaboration and learning, as well as persistent cultural barriers that may limit the effectiveness of the two-phase procurement approach.

Table 22: Statements about Innovation

Innovation	
Statement	**Source**
Delivers solutions that are more appropriate and buildable.	Atkinson et al., 2023
Encourages innovation.	Atkinson et al., 2023
Improves technical solutions.	Atkinson et al., 2023
Achieves continuous improvement.	Atkinson et al., 2023
Improves the practical buildability of the design.	Eadie and Graham, 2014
Stimulates innovation through collaboration between client and contractor.	Eadie and Graham, 2014
Enhances the buildability of the design through early contractor involvement.	Eadie and Graham, 2014
Encourages innovative solutions through early understanding of risks.	Eadie and Graham, 2014
Makes improved buildability one of the main advantages of the process.	Eadie and Graham, 2014
Stimulates the use of innovative and sustainable construction methods.	Friedinger and Sander, 2024
Hampers innovation and adoption of new procurement approaches due to slow client decision-making.	Hällström and Bosch-Sijtsema, 2019
Supports sustainability goals by combining the right expertise with innovative solutions.	Ishtiaque, Malvik, et al., 2025
Creates space within the project to use the innovation potential of suppliers.	Ishtiaque, Wondimu, and Klakegg, 2025
Can reduce total project costs compared to initial estimates through efficient and innovative solutions.	Ishtiaque, Wondimu, and Klakegg, 2025
Stimulates innovation in planning and technical execution.	Ishtiaque, Wondimu, Memic, et al., 2025
Enhances innovation within projects.	Ishtiaque, Wondimu, Memic, et al., 2025
Enables continuous improvement of design features.	Laryea and Watermeyer, 2016
Optimises design outcomes.	Laryea and Watermeyer, 2016
Encourages innovation in construction technologies and methods.	Laryea and Watermeyer, 2016
Increases opportunities for innovation.	Laryea and Watermeyer, 2016
Allows space for creative solutions.	Lenferink et al., 2012
Requires acceptance of uncertainty and room for innovation for successful application.	Lenferink et al., 2012
Creates space for creativity and innovation.	Rahman and Alhassan, 2012
Supports continuous improvement and flexibility.	Rahman and Alhassan, 2012
Requires contracts with enough flexibility to support new ideas.	Wondimu, Hosseini, et al., 2016
Limits innovation through strict role division and formal governance.	Fijneman and CROW, 2020
Limits innovation by enforcing a strict division of roles and responsibilities.	Fijneman and CROW, 2020
Breaks the belief that complexity can only be controlled through extensive contracts and strict requirements.	Heemskerk et al., 2024
Adds most value in complex projects requiring innovation and expertise from both sides.	Dijkwerkers Werken Door, 2020
Creates flexibility and better outcomes through adjustable design, scope and methods.	Mobilis TBI, 2025
Sparks innovation and efficiency through knowledge sharing.	Mobilis TBI, 2025
Improves risk control and stimulates innovation through early market involvement.	Ministerie van Infrastructuur en Waterstaat, 2023
Delivers more cost-efficient design solutions.	HDP Consult, 2018
Uses contractor input in design to spur innovation and lower build risk.	Brodies, 2020
Provides more innovative solutions due to the longer design phase.	Ministerie van Infrastructuur en Waterstaat, 2019
Demonstrates promising solutions with minimal disruption, relevant for future maintenance.	Ter Maten et al., 2022

Statements Innovation

Table 22 presents the statements related to the Innovation theme. In total, 36 statements were identified within this theme.

The statements largely focus on the extent to which the two-phase procurement approach creates space for innovation in design, technical solutions, and construction methods. Many statements highlight improved buildability, more efficient and practical design solutions, and the use of contractor expertise to optimise technical outcomes. Innovation is frequently linked to early involvement, longer design phases, and closer collaboration between clients and contractors.

A second recurring topic concerns flexibility and learning within projects. Several statements emphasise the importance of allowing room for creativity, experimentation, and continuous improvement, often in relation to managing complexity, uncertainty, and project risks. In this context, innovation is framed as a response to complex projects that require input and expertise from multiple parties.

In addition, a number of statements point to constraints on innovation, such as strict role divisions, formal governance structures, and slow or rigid client decision-making. Overall, the Innovation statements reflect both the potential of the two-phase procurement approach to stimulate innovative solutions and the conditions under which this potential may be limited in practice.

Table 23: Statements about Pricing

Pricing	
Statement	**Source**
Increases profit margins.	Atkinson et al., 2023
Operates under tight profit margins that discourage transparency and prevent open-book collaboration.	Atkinson et al., 2023
Provides accurate insight into project costs through early collaboration.	Eadie and Graham, 2014
Uses transparent, collaborative pricing to lower project costs and secure resources in tight markets.	Finnie et al., 2019
Makes clients pay a premium for early involvement because competition is reduced.	Finnie et al., 2019
Creates conflicts of interest when contractors focus too strongly on costs.	Finnie and Smith, 2021
Makes clients pay a premium for early involvement due to reduced competition.	Finnie and Smith, 2021
Uses incentives that do not fully meet the needs of either client or contractor.	Hällström and Bosch-Sijtsema, 2019
Results in higher overall project costs.	Ishtiaque, Wondimu, and Klakegg, 2025
Provides greater transparency through open-book pricing, even if not always the cheapest option.	Ishtiaque, Wondimu, and Klakegg, 2025
Provides insufficient remuneration for contractor contributions and expertise.	Ishtiaque, Wondimu, Memic, et al., 2025
Increases cost visibility, accuracy and certainty.	Rahman and Alhassan, 2012
Improves profitability and overall project returns.	Rahman and Alhassan, 2012
Improves pricing certainty through detailed design input but extends the tender process.	Saunders et al., 2024
Faces the main challenge of achieving the right price.	Saunders et al., 2024
Does not guarantee lower construction costs but provides a more realistic view of final costs.	Sheamar et al., 2024
Encourages transparency when profit margins are satisfactory.	Sheamar et al., 2024
Gives clients more control over costs by clarifying prices earlier in the process.	Wondimu, Hailemichael, et al., 2016
Depends on fair compensation for the contractor's contribution.	Wondimu, Hailemichael, et al., 2016
Ensures transparent competition across all cost elements.	Cabinet Office UK, 2014
Safeguards profit margins through open-book costing and prior fee agreements when cost savings are achieved.	Cabinet Office UK, 2014
Incentivises contractors to perform efficiently within target costs.	Chao-Duivis, 2019
Makes projects ultimately cheaper by letting go of price certainty at the start.	Chao-Duivis, 2019
Creates uncertainty about fairness when awarding based purely on quality.	Fijneman and CROW, 2020
Leaves room for opportunistic behaviour when cost control is poorly managed.	Fijneman and CROW, 2020
Enables contractors to use enthusiasm about the design and schedule pressure to push for higher prices.	Fijneman and CROW, 2020
Puts contractors under pressure to reduce prices to secure the second phase.	Fijneman and CROW, 2020
Causes public clients to feel compelled to accept a price to avoid delays.	Fijneman and CROW, 2020
Reduces openness and trust when too many elements are priced during tendering.	Fijneman and CROW, 2020
Encourages strategic behaviour when quantities are unfixed.	Fijneman and CROW, 2020
Leads to higher prices when direct competition is absent during price formation.	Fijneman and CROW, 2020
Keeps price as the dominant factor in many best price–quality ratio evaluations despite good intentions.	Heemskerk et al., 2024
Creates through the Go/No-Go moment a balanced incentive to achieve a joint outcome.	Heemskerk et al., 2024
Prevents tunnel vision and improves overall project outcomes by avoiding early price fixation.	Heemskerk et al., 2024
Requires a level playing field in tendering to maintain fair competition.	Van Belzen, 2024
Faces recurring challenges in determining whether prices are market-conform.	Van Belzen, 2024
Uses external expertise to verify the market conformity of prices.	Van Belzen, 2024
Has a lack of price competition during price formation.	Dijkwerkers Werken Door, 2020
Makes collaboration unrealistic without a clear budget or price direction.	Dijkwerkers Werken Door, 2020
Proves advantageous for the contractor.	Bleeker and Den Houting, 2020
Encourages both client and contractor to keep the cost estimate within the agreed reliability margin.	C. E. C. Jansen, 2021
Carries the risk that parties must negotiate the second-phase contract without market competition.	C. Jansen, 2019
Makes tendering a beauty contest where overpolishing can harm later collaboration.	Boogaard, 2021
Attempts to exclude price from the tender phase, though in practice it still plays a role.	Boogaard, 2021
Faces a paradox where price plays both no role and an important one.	Boogaard, 2021
Conflicts in practice with the idea of "fair work for fair pay."	Bosch, 2023
Delivers predictable phase-2 results with few price shocks.	Mobilis TBI, 2025
Causes the initial budget to differ from the final phase-1 price.	Mobilis TBI, 2025

Pricing	
Statement	**Source**
Ensures a more realistic final price.	Eque2, 2016
Gives the preferred bidder more leverage as competition drops, raising escalation risk.	Eque2, 2016
Exposes clients to supplier collusion when no fixed final price is agreed.	Eque2, 2016
Prevents premature price setting under uncertainty through staged pricing.	Kwaak, 2022
Serves as a key tool for balanced pricing.	Gebouwd, 2020
Requires clients to be transparent about project scope and financial scale.	Gebouwd, 2020
Gives contractors a fair chance at profit, balanced by client exit options.	Ministerie van Infrastructuur en Waterstaat, 2023
Makes negotiations with the preferred bidder more challenging.	HDP Consult, 2018
Delivers greater cost certainty and potential client savings.	Brodies, 2020
Makes the preferred contractor less competitive, raising escalation risk.	Brodies, 2020
Accepts higher initial costs in exchange for fewer changes and claims during execution.	Designing Buildings, n.d.
Bases the contract on joint design development, making the final price more reliable.	Koenen, 2019
Allows for accurate cost estimation before execution.	Koenen, 2019
Ensures contractors are fairly paid for the hours invested, keeping the process transparent.	Koenen, 2019
Allows open-book accounting when fair commercial rates are applied during execution.	Koenen, 2019
Makes the final price no longer a shot in the dark.	Koenen, 2019
Provides a fair profit margin that aligns with the principle of “fair pay for fair work.”	“Community of Practice Rijkswaterstaat tweefasenaanpak”, 2025

Statements Pricing

Table 23 presents the statements related to the Pricing theme. In total, 65 statements were identified within this theme.

The statements largely focus on how pricing is shaped within the two-phase procurement approach and how early collaboration affects cost visibility, price formation, and incentives. Many statements refer to increased cost transparency, more realistic pricing, and improved insight into final project costs through open-book arrangements and early design input. Pricing is frequently framed as a mechanism for improving cost certainty rather than achieving the lowest price.

A second recurring topic concerns the effects of reduced competition during price formation. Several statements highlight risks related to higher prices, opportunistic or strategic behaviour, and increased leverage of the preferred contractor, particularly in the absence of direct price competition. The Go/No-Go moment is frequently mentioned as an important element influencing pricing dynamics, either by balancing incentives or by creating pressure on public clients to accept proposed prices.

In addition, a number of statements address fairness and compensation, including discussions about profit margins, “fair work for fair pay,” and the conditions under which contractors are willing to work transparently. Overall, the Pricing statements reflect both the potential benefits of staged and transparent pricing and the tensions that arise when price certainty, competition, and collaboration are combined within the two-phase procurement approach.

Table 24: Statements about Risk Allocation

Risk Allocation	
Statement	**Source**
Makes risks and opportunities transparent and manageable.	Atkinson et al., 2023
Makes project outcomes more predictable.	Atkinson et al., 2023
Leads to more effective and balanced risk management through joint assessment.	Eadie and Graham, 2014
Reduces overall project risk and uncertainty through early cooperation.	Eadie and Graham, 2014
Increases project understanding and provides greater cost and schedule certainty.	Eadie and Graham, 2014
Supports effective risk management in large or complex projects but offers limited benefits for smaller or low-risk schemes.	Eadie and Graham, 2014

Risk Allocation	
Statement	**Source**
Provides a more realistic construction programme through early contractor involvement and better project understanding.	Finnie and Smith, 2021
Offsets higher initial costs with lower final costs.	Finnie and Smith, 2021
Increases the risk of late problem detection when innovation is used to meet sustainability targets, leading to delays and overruns.	Ishtiaque, Malvik, et al., 2025
Increases predictability of project costs.	Ishtiaque, Wondimu, and Klakegg, 2025
Increases scope certainty and strengthens control over the project timeline.	Ishtiaque, Wondimu, and Klakegg, 2025
Strengthens risk mitigation through joint risk management and shared understanding of risks.	Ishtiaque, Wondimu, and Klakegg, 2025
Increases control over project costs.	Ishtiaque, Wondimu, Memic, et al., 2025
Increases predictability of project timelines.	Ishtiaque, Wondimu, Memic, et al., 2025
Strengthens risk mitigation and shared understanding of risks.	Ishtiaque, Wondimu, Memic, et al., 2025
Delivers cost savings and supports risk management in large projects.	Laryea and Watermeyer, 2016
Strengthens risk management in projects.	Laryea and Watermeyer, 2016
Improves project risk management.	Laryea and Watermeyer, 2016
May lead contractors to reject new risks later in the process.	Laryea and Watermeyer, 2016
Provides greater control over project costs.	Lenferink et al., 2012
Requires parties to give up certain guarantees and detailed promises without losing overall control.	Lenferink et al., 2012
Involves higher risks for both client and contractor.	Lenferink et al., 2012
Faces uncertainty about whether added value outweighs higher transaction and procedural risks.	Lenferink et al., 2012
Gives contractors more freedom but includes political dynamics as part of their entrepreneurial risk.	Lenferink et al., 2012
Provides better cost control.	Rahman and Alhassan, 2012
Strengthens project risk management.	Rahman and Alhassan, 2012
Misses opportunities for risk sharing due to late involvement or poor preparation.	Rahman and Alhassan, 2012
Allocates risks and responsibilities inappropriately.	Rahman and Alhassan, 2012
Requires a manageable level of risk transfer to contractors.	Wondimu, Hailemichael, et al., 2016
Provides an early platform for identifying and managing project risks.	Cabinet Office UK, 2014
Increases legal risks to the point that communication between parties deteriorates.	Chao-Duivis, 2019
Leaves too many unknown risks with the contractor because clients are not required to share sufficient information.	Chao-Duivis, 2019
Reduces overall project risks.	Chao-Duivis, 2019
Reduces the risk of cost and time overruns by allowing more time for risk assessment.	Chao-Duivis, 2019
Limits flexibility when substantial risks arise.	Chao-Duivis, 2019
Reduces uncertainty within projects.	Chao-Duivis, 2019
Prevents excessive dependency on a single contractor.	Fijneman and CROW, 2020
Helps control risks by linking ambition with execution knowledge in the planning phase.	Van Belzen, 2024
Relies on a clear allocation of risks and responsibilities to ensure fair value exchange.	Van Belzen, 2024
Must be tailored to project context and risk profile rather than seen as a universal solution.	Van Belzen, 2024
Gives the public client a strong degree of control over the project.	Bleeker and Den Houting, 2020
Provides greater certainty for both client and contractor.	Bleeker and Den Houting, 2020
A certain level of uncertainty always remains when signing a contract, as some assumptions may later prove incomplete or incorrect.	C. E. C. Jansen, 2021
Leaves uncertainty about whether current contract conditions truly encourage joint and proactive risk management.	C. E. C. Jansen, 2021
Requires the client to bear the consequences of risks outside the contractor's reliability margin.	C. E. C. Jansen, 2021
Assumes that not everything can be known in advance.	De Groot and Gieske, 2025
Requires Rijkswaterstaat to be more aware of project uncertainties.	Bosch, 2023
Makes shared responsibility in Phase 1 unrealistic under UAV-GC.	Bosch, 2023
Helps understand risks and project specifics before fixing price and schedule.	Mobilis TBI, 2025
Reduces execution issues through earlier risk identification and control.	Mobilis TBI, 2025
Risks scope creep and cost growth due to design flexibility.	Mobilis TBI, 2025
Faces risk that the preferred contractor experiences financial distress before contract award.	Eque2, 2016
Requires clear exit conditions to be defined at the outset.	Eque2, 2016
Shares risks fairly between client and contractor.	PIANOo, n.d.-d

Risk Allocation	
Statement	**Source**
Refines assumptions and risk profiles by working with a single party.	Gebouwd, 2020
Reduces budget uncertainty.	Ministerie van Infrastructuur en Waterstaat, 2023
Reduces risks and uncertainties through early market involvement.	Ministerie van Infrastructuur en Waterstaat, 2023
Provides early contractor involvement and reduces uncertainty.	HDP Consult, 2018
Reduces uncertainties and risks.	HDP Consult, 2018
Reduces delay risk.	Brodies, 2020
Transfers design risk to the contractor, but reduces client leverage as competition declines.	Designing Buildings, n.d.
Limits the financial risks for both parties.	Ministerie van Infrastructuur en Waterstaat, 2019
Leads to less additional work.	Ministerie van Infrastructuur en Waterstaat, 2019
Blurs roles and responsibilities as contractors assume client tasks.	Van Netten, 2024
Enables a more realistic and fair price estimate, reducing the risk of major setbacks during construction.	Koenen, 2019
Gives contractors a clearer understanding of the risks and scope before starting.	Koenen, 2019

Statements Risk Allocation

Table 24 presents the statements related to the Risk Allocation theme. In total, 66 statements were identified within this theme.

The statements largely focus on how the two-phase procurement approach influences the identification, distribution, and management of risks throughout the project lifecycle. Many statements emphasise improved risk transparency, earlier risk identification, and greater predictability of costs, schedules, and project outcomes through joint risk assessment and early cooperation.

A second recurring topic concerns control and responsibility. Several statements highlight increased control for public clients, clearer insight into risks before price and scope are fixed, and more realistic assumptions about uncertainty. At the same time, other statements point to tensions related to risk transfer, reduced flexibility, blurred roles, and the challenges of defining fair and appropriate risk allocation between client and contractor.

In addition, a number of statements address potential trade-offs and limitations, such as higher initial risks, reduced competition, financial exposure of preferred contractors, and the persistence of residual uncertainty despite early collaboration. Overall, the Risk Allocation statements reflect both the intended benefits of shared and proactive risk management and the complexities that arise when risks are redistributed within the two-phase procurement approach.

Table 25: Statements about Transaction Costs

Transaction Costs	
Statement	**Source**
Shortens lead times.	Atkinson et al., 2023
Accelerates project delivery.	Eadie and Graham, 2014
Raises tendering costs and creates inefficiencies when contractors are appointed too early and competition is limited.	Finnie et al., 2019
Involves too many decision-makers at an early stage.	Finnie et al., 2019
Increases procurement fees through two-stage procedures and multiple trade reviews.	Finnie et al., 2019
Extends the pre-construction phase but shortens the construction stage.	Finnie and Smith, 2021
Improves productivity by reducing overall project cycle time.	Ishtiaque, Wondimu, and Klakegg, 2025
Shortens project delivery time.	Ishtiaque, Wondimu, and Klakegg, 2025
Shortens project execution time.	Ishtiaque, Wondimu, Memic, et al., 2025
Shortens the total project duration from design to completion.	Laryea and Watermeyer, 2016
Achieves time efficiency and control more easily than innovation.	Lenferink et al., 2012
Improves schedules, shortens timelines and increases time certainty.	Rahman and Alhassan, 2012
Operates with an insufficient timeframe for tendering.	Saunders et al., 2024
Leads to bureaucracy and higher costs when contractors are involved too early.	Wondimu, Hailemichael, et al., 2016
Reduces tendering costs.	Fijneman and CROW, 2020
Shortens the procurement period significantly compared with traditional procurement.	Dijkwerkers Werken Door, 2020
Reduces the tender period from 9–12 months to around 4–5 months.	Dijkwerkers Werken Door, 2020
Reduces procurement costs.	Dijkwerkers Werken Door, 2020
Shortens the total project duration.	Dijkwerkers Werken Door, 2020
Simplifies the procurement procedure compared with traditional integrated contract forms.	C. Jansen, 2019
Turns procurement into a short and selective 'beauty contest.'	Koenen, 2019
Reduces tender and failure costs through early cooperation and shared expertise.	Mobilis TBI, 2025
Increases phase-1 costs because of the effort required for joint decision-making.	Mobilis TBI, 2025
Can be time-consuming, especially when negotiations take longer than expected.	Eque2, 2016
Creates time pressure when multiple projects run in parallel.	Ministerie van Infrastructuur en Waterstaat, 2023
Involves longer procurement and potentially higher consultancy costs.	HDP Consult, 2018
Extends procurement lead time.	HDP Consult, 2018
May result in higher consultancy costs.	HDP Consult, 2018
Takes more time and is less suited to tight schedules.	Brodies, 2020
Involves long and complex phase-2 negotiations.	Brodies, 2020

Statements Transaction Costs

Table 25 presents the statements related to the Transaction Costs theme. In total, 30 statements were identified within this theme.

The statements largely focus on how the two-phase procurement approach affects time, effort, and administrative costs throughout the procurement and project lifecycle.

A second recurring topic concerns the distribution of effort and costs across project phases. Several statements note that while the pre-construction or procurement phase may become longer or more resource-intensive, this can be offset by shorter construction phases and improved time certainty later in the project. At the same time, a number of statements point to increased costs related to consultancy, coordination, and decision-making in the early stages.

In addition, several statements highlight potential inefficiencies, such as increased bureaucracy, involvement of many decision-makers, long negotiations, and challenges when multiple projects run in parallel. Overall, the Transaction Costs statements reflect both expected efficiency gains and the trade-offs that arise when time and effort are shifted between project phases within the two-phase procurement approach.

Table 26: Statements about Value for Money

Value for Money	
Statement	**Source**
Considers whole-life costs more thoroughly.	Atkinson et al., 2023
Saves time and money across projects.	Atkinson et al., 2023
Reduces waste.	Atkinson et al., 2023
Improves quality.	Atkinson et al., 2023
Prevents defects.	Atkinson et al., 2023
Increases customer satisfaction.	Atkinson et al., 2023
Reduces waste.	Atkinson et al., 2023
Strengthens the focus on quality and long-term value instead of the lowest price.	Eadie and Graham, 2014
Enables clients to create additional value beyond construction activities.	Eadie and Graham, 2014
Generates financial savings through better design development.	Eadie and Graham, 2014
Leads to more cost-effective design decisions through better understanding of logistics and construction.	Eadie and Graham, 2014
Has not always delivered consistent cost savings.	Eadie and Graham, 2014
Achieves cost savings more easily than time savings.	Eadie and Graham, 2014
Risks becoming a marketing label for negotiated contracts instead of a genuine value-adding process.	Finnie et al., 2019
Keeps clients and consultants hesitant due to weak competition and unclear added value.	Finnie et al., 2019
Delivers value mainly through savings achieved at the end of the project rather than at the start.	Finnie and Smith, 2021
Generates real value when all parties take ownership and contribute actively to design and buildability.	Finnie and Smith, 2021
Ensures fair execution within the agreed budget.	Friedinger and Sander, 2024
Remains a viable option for sustainable construction despite higher collaboration costs.	Ishtiaque, Malvik, et al., 2025
Requires clients to assess long-term value more carefully before applying it.	Ishtiaque, Wondimu, and Klakegg, 2025
Achieves value for money through innovation and non-price-based contractor selection.	Ishtiaque, Wondimu, and Klakegg, 2025
Offsets higher initial costs with greater overall value creation.	Ishtiaque, Wondimu, and Klakegg, 2025
Leads to higher quality standards in construction projects.	Ishtiaque, Wondimu, and Klakegg, 2025
Makes demonstrating value for money difficult.	Ishtiaque, Wondimu, Memic, et al., 2025
Delivers higher client value.	Ishtiaque, Wondimu, Memic, et al., 2025
Contributes to overall project cost reduction.	Ishtiaque, Wondimu, Memic, et al., 2025
Adds value by saving time, improving control and stimulating innovation.	Laryea and Watermeyer, 2016
Improves value for money and shortens project delivery time.	Laryea and Watermeyer, 2016
Reduces project costs through early contractor experience.	Laryea and Watermeyer, 2016
Reduces environmental impact.	Laryea and Watermeyer, 2016
Supports optimisation of asset management.	Laryea and Watermeyer, 2016
Mainly reduces costs for complex projects.	Laryea and Watermeyer, 2016
Adds value for money without compromising design quality.	Laryea and Watermeyer, 2016
Involves contractors to seize opportunities and lower costs.	Malvik et al., 2021
Involves contractors to create greater value for the client.	Malvik et al., 2021
Improves the overall quality of the project.	Rahman and Alhassan, 2012
Improves value for money and shortens project delivery time.	Wondimu, Hailemichael, et al., 2016
Creates positive incentives and proven savings by focusing on lowest cost rather than lowest price.	Heemskerk et al., 2024
Leads to the best design solution at the lowest societal cost.	Dijkwerkers Werken Door, 2020
Requires recognition of creativity and effort rather than a focus on lowest price.	Arends, Meer, et al., 2017
Prioritises quality over time and budget during the first phase of the project.	Boogaard, 2021
Rewards investing in Phase 1 with a more robust Phase 2 execution.	Mobilis TBI, 2025
Makes investing in a single integrated public client–contractor team worthwhile.	Mobilis TBI, 2025
Repays early energy investment in later project stages.	Mobilis TBI, 2025
Aims for lowest total cost rather than lowest price.	Mobilis TBI, 2025
Raises quality across the full life cycle through joint effort.	Mobilis TBI, 2025
Improves efficiency, value and project outcomes when applied correctly.	Eque2, 2016
Improves the project result at too high a project price.	“Community of Practice Rijkswaterstaat tweefasenaanpak”, 2025

Statements Value of Money

Table 26 presents the statements related to the Value for Money theme. In total, 48 statements were identified within this theme.

The statements largely focus on how the two-phase procurement approach is expected to create value beyond lowest-price considerations. Many statements emphasise improved quality, reduced waste, better design solutions, and stronger attention to whole-life costs. Value for money is frequently framed in terms of higher overall project quality, improved client satisfaction, and more robust execution outcomes.

A second recurring topic concerns the trade-off between higher upfront investment and longer-term value creation. Several statements highlight that additional effort and costs in the early phase may be offset by savings, improved control, and reduced issues during execution. In this context, value for money is often linked to investing in collaboration, integrated teams, and early contractor involvement.

In addition, a number of statements express more critical perspectives, noting that value for money can be difficult to demonstrate, that cost savings are not always consistent, or that improved outcomes may come at a relatively high project price. Overall, the Value for Money statements reflect both optimistic expectations about value creation and reservations about whether these benefits are always realised in practice.

Table 27: Final Q-set in Dutch

Nr.	Statement	Source
Capability		
1.	Vermindert ontwerp- en scopewijzigingen tijdens de uitvoering.	Ishtiaque, Wondimu, Memic, et al., 2025
2.	Wordt belemmerd doordat opdrachtgevers onvoldoende kennis hebben om kostenramingen goed te beoordelen.	Wondimu, Hailemichael, et al., 2016
3.	Komt niet goed tot zijn recht doordat opdrachtgevers niet over de capaciteit beschikken om (mee) te ontwerpen, kwaliteit te bewaken en kosten te controleren.	Chao-Duivis, 2019
4.	Werkt minder goed doordat houding en gedrag in de praktijk niet veranderen.	Mobilis TBI, 2025
5.	Vereist het behoud van kennis in het projectteam om goed te kunnen functioneren.	Van Belzen, 2024
Collaboration		
6.	Vermindert geschillen tussen partijen.	Rahman and Alhassan, 2012
7.	Vergroot de tevredenheid van zowel de opdrachtgever als de opdrachtnemer.	Rahman and Alhassan, 2012
8.	Bouwt vertrouwen op tussen opdrachtgever en opdrachtnemer door kostentransparantie.	Sheamar et al., 2024
9.	Bevordert langdurige samenwerking tussen opdrachtgever en opdrachtnemer.	Arends, Meer, et al., 2017
10.	Verbetert het projectresultaat tegen een te hoge projectprijs.	“Community of Practice Rijkswaterstaat tweefasenaanpak”, 2025
11.	Verzwakt de toewijding van opdrachtgever en opdrachtnemer door de aanwezigheid van het Go/No-Go-moment.	“Community of Practice Rijkswaterstaat tweefasenaanpak”, 2025
Culture		
12.	Draagt bij aan een gezondere en vitalere bouwsector.	Van Belzen, 2024
13.	Creëert een positievere, motiverende en veilige projectcultuur.	Van Belzen, 2024
14.	Beloont het voorkomen van fouten in plaats van het herstellen daarvan.	C. Jansen, 2019
15.	Blijft nog steeds een sterk wij-zij-gevoel uitstralen.	Bosch, 2023
16.	Verandert aanbesteden in een te korte en te selectieve ‘schoonheidswedstrijd’.	Koenen, 2019
17.	Leidt ertoe dat de nadruk op samenwerkingstrainingen samenwerking te veel vastlegt in rollen en procedures.	Koenen, 2019
Innovation		
18.	Verbetert de praktische uitvoerbaarheid van het ontwerp.	Eadie and Graham, 2014
19.	Stimuleert het gebruik van innovatieve en duurzame bouwmethoden.	Friedinger and Sander, 2024
20.	Doorbreekt de gedachte dat complexiteit alleen kan worden beheerst met uitgebreide contracten en strikte eisen.	Heemskerk et al., 2024
21.	Levert kostenefficiëntere ontwerpoplossingen.	HDP Consult, 2018

Nr.	Statement	Source
22.	Zorgt door de langere ontwerpfase voor innovatievere oplossingen.	Ministerie van Infrastructuur en Waterstaat, 2019
Pricing		
23.	Maakt het mogelijk dat aannemers het enthousiasme over het ontwerp en de tijdsdruk gebruiken om hogere prijzen af te dwingen.	Fijneman and CROW, 2020
24.	Zorgt ervoor dat opdrachtgevers zich gedwongen voelen een prijs te accepteren om vertraging te voorkomen.	Fijneman and CROW, 2020
25.	Zorgt met het Go/No-Go-moment voor een evenwichtige prikkel om een gezamenlijk resultaat te bereiken.	Heemskerk et al., 2024
26.	Accepteert hogere aanvangskosten in ruil voor minder wijzigingen en claims in de uitvoeringsfase.	Designing Buildings, n.d.
27.	Botst in de praktijk met “eerlijk werk voor eerlijk geld”.	Bosch, 2023
28.	Zorgt voor een eerlijk winstpercentage dat past bij het principe van ‘eerlijk geld voor eerlijk werk’.	“Community of Practice Rijkswaterstaat tweefasenaanpak”, 2025
Risk Allocation		
29.	Compenseert hogere aanvangskosten met lagere eindkosten.	Finnie and Smith, 2021
30.	Verkleint door meer tijd voor risico-inschatting het risico op kosten- en tijdsoverschrijdingen.	Chao-Duivis, 2019
31.	Geeft de opdrachtgever een sterke mate van grip op het project.	Bleeker and Den Houting, 2020
32.	Beperkt de financiële risico’s voor beide partijen.	Ministerie van Infrastructuur en Waterstaat, 2019
33.	Leidt tot minder meerwerk.	Ministerie van Infrastructuur en Waterstaat, 2019
Transaction Costs		
34.	Betrekt te veel besluitvormers in een vroeg stadium.	Finnie et al., 2019
35.	Verkort de aanbestedingstijd aanzienlijk vergeleken met traditionele aanbestedingen.	Dijkwerkers Werken Door, 2020
36.	Verlaagt de aanbestedingskosten.	Dijkwerkers Werken Door, 2020
37.	Verkort de totale doorlooptijd van een project.	Dijkwerkers Werken Door, 2020
38.	Vereenvoudigt de aanbestedingsprocedure ten opzichte van traditionele geïntegreerde contractvormen.	C. Jansen, 2019
Value for Money		
39.	Versterkt de focus op kwaliteit en langetermijnwaarde in plaats van op de laagste prijs.	Eadie and Graham, 2014
40.	Levert een hogere klantwaarde op.	Ishtiaque, Wondimu, Memic, et al., 2025
41.	Verbetert de algemene kwaliteit van het project.	Rahman and Alhassan, 2012
42.	Beloont investeren in fase 1 met een robustere uitvoering in fase 2.	Mobilis TBI, 2025
43.	Maakt investeren in één integraal opdrachtgever-opdrachtnemerteam de moeite waard.	Mobilis TBI, 2025

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Q-analysis

Participants' Q-sorts

This appendix presents the Q-sorts of all participants. Table 28 shows the position of each statement in the participants' Q-sorts, with statement numbers presented in columns and respondents listed in rows.

Table 28: Q-sort Scores per Participant

Participants	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17	S18	S19	S20	S21	S22
1.	4	4	3	1	2	-1	0	-4	0	-1	-3	1	0	2	3	2	-2	0	-3	-1	-3	-4
2.	3	1	-1	-1	0	3	0	2	1	-4	-2	4	0	2	-3	-3	-1	1	-2	2	0	-1
3.	2	-1	-3	-1	1	3	4	2	1	-3	-1	3	2	0	-2	-3	-4	2	0	-2	1	0
4.	-4	-1	2	0	-2	4	2	1	1	0	0	3	-1	0	0	-3	2	3	-3	0	-1	-2
5.	0	-2	-2	-2	0	3	2	4	1	-3	-3	0	2	0	0	-3	0	4	2	1	3	0
6.	4	4	-4	-1	4	-1	1	-1	0	-2	-1	0	3	-2	0	0	-1	3	1	1	1	3
7.	4	0	0	-3	3	3	2	2	0	-3	-4	4	2	-2	-4	-2	-2	3	0	1	-1	-1
8.	0	-2	-3	-2	0	2	4	3	2	-3	-4	0	-1	1	-4	-1	-2	2	0	0	-1	-1
9.	4	-1	1	-2	0	0	2	4	4	0	-3	1	-1	-3	-1	-4	-4	2	2	0	-1	1
10.	0	-4	-3	-1	3	-1	0	4	3	-3	-3	1	1	3	-3	-2	-2	2	-4	4	0	0
11.	2	-2	0	0	-1	0	1	2	2	-4	-3	3	1	0	-3	-2	-3	4	-2	-1	3	-2
12.	2	0	0	-3	0	1	-2	2	3	-3	-4	0	1	-1	-2	1	0	4	-3	1	-1	-3
13.	3	-1	-1	-3	-2	3	1	0	-1	-2	-3	1	1	2	-1	-3	-1	-1	-2	-2	0	-4
14.	2	-2	-2	-2	1	2	2	1	1	-1	-4	4	3	1	-4	-1	-3	1	-1	3	0	-1
15.	-1	-4	-1	-2	4	1	1	1	0	-1	-4	0	4	3	-4	-2	-1	0	3	1	0	-3
16.	4	-3	-2	-1	3	-1	0	1	2	1	-1	0	2	3	-1	1	-3	4	0	0	-2	0
17.	-1	3	4	4	2	0	-3	-2	-1	2	0	1	-2	2	0	1	-3	3	2	-3	-4	1
18.	4	-2	-1	-4	0	1	1	0	4	-3	-3	3	2	1	-4	-3	-2	2	0	2	2	-2
19.	2	4	0	-3	1	2	2	-4	0	-1	-4	4	3	1	-2	3	-3	1	-2	2	-1	-1
20.	3	-2	-2	-3	0	1	1	0	2	-4	-2	0	1	0	-3	-3	-3	3	-1	2	4	-1
21.	0	-3	-2	-2	3	4	4	1	-2	-3	-3	-1	2	-4	-4	-2	-3	3	2	0	1	-2
22.	4	-1	0	-3	4	3	2	2	-1	-4	-2	-1	-1	2	-3	-3	-2	4	1	2	3	1
23.	3	4	3	0	1	2	-1	0	1	1	-3	3	0	1	0	-4	-2	0	-3	0	-3	-2
24.	-1	0	3	-1	1	1	4	2	2	-2	-3	0	3	-1	0	-4	-1	0	-2	1	1	0
25.	4	-1	-1	-2	0	2	0	1	1	-4	-3	2	0	2	-3	-4	-2	3	-1	1	-3	0
26.	-1	0	3	-3	1	0	2	-2	2	4	0	-1	-2	0	-3	2	-1	2	0	0	-4	-1

Participants	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32	S33	S34	S35	S36	S37	S38	S39	S40	S41	S42	S43
1.	-2	1	-1	1	-2	0	2	3	1	-1	1	-4	4	2	-3	-2	3	-2	0	0	-1
2.	-3	-2	1	1	-4	4	0	3	0	4	2	-2	-3	0	-4	-1	3	-1	2	1	-2
3.	-4	-4	-1	0	-3	3	0	2	0	4	3	-1	-2	-2	-1	-2	4	1	1	1	0
4.	1	0	-2	2	-1	3	2	4	1	1	-2	-1	-3	-4	-4	-3	1	-1	3	4	-2
5.	-4	-4	-1	3	-3	2	-1	4	-1	1	1	-2	-1	-2	-1	-4	-1	3	1	2	1
6.	1	3	2	0	-3	-2	-2	-2	0	-3	-1	-3	-4	-3	1	-4	2	0	2	2	2
7.	-3	-1	1	1	-4	2	1	3	0	0	1	-3	-1	-1	-2	-1	2	0	1	4	-2
8.	-3	-4	3	1	-2	3	1	3	0	4	1	-3	-1	0	-2	-1	2	2	4	1	1
9.	-3	-2	-1	1	-3	0	1	0	0	3	2	-4	-2	-2	-1	-2	3	2	1	3	3
10.	-2	-4	-1	0	-2	0	2	2	-1	4	1	-2	2	-1	1	-1	2	0	1	3	1
11.	-3	-4	-1	1	-4	4	0	2	-1	1	3	-2	-1	0	-1	1	2	1	3	4	0
12.	-1	-4	3	2	0	2	-2	4	0	2	1	-1	-2	-1	-2	-4	3	-1	1	4	3
13.	-4	0	1	2	-3	4	4	0	0	2	-2	-4	0	2	3	0	1	4	3	2	1
14.	-4	-3	4	3	-3	-1	3	-2	0	2	2	-3	-2	0	0	-1	1	0	0	4	0
15.	-2	-2	0	0	-3	1	2	-3	1	4	2	-1	2	2	-3	-2	3	2	0	3	-1
16.	-4	-3	1	3	-1	-1	-4	4	-4	-2	2	-2	-3	1	1	-2	2	0	2	3	0
17.	-1	4	-1	1	1	-2	0	1	-4	-2	3	-2	-1	-4	0	-1	-3	3	0	2	0
18.	-1	-2	0	-1	-4	1	0	2	1	3	-1	-3	-1	-1	0	-2	1	4	0	3	3
19.	-3	-4	1	4	-3	0	1	-1	1	-1	3	-2	-2	0	0	-2	2	0	0	3	-1
20.	-4	-4	1	-1	-2	-1	0	2	3	4	3	-2	-1	-1	0	0	2	4	2	1	1
21.	-1	-1	2	0	-4	3	1	0	-1	0	0	-1	3	-1	1	1	2	1	2	4	0
22.	0	-2	1	0	-2	1	0	3	-2	2	0	0	-4	-4	3	-3	-1	0	-1	1	1
23.	-2	1	2	3	-4	4	-4	4	2	-2	1	-1	-1	-3	-2	-1	2	0	-1	2	-1
24.	-3	-1	-4	2	-2	0	1	3	-4	4	2	-2	-1	-3	-2	-3	2	1	0	4	3
25.	-2	-2	2	3	-3	1	-1	3	0	0	1	-4	-2	-1	1	0	4	-1	2	3	4
26.	3	4	-1	3	4	1	-3	-3	-4	-2	-2	1	2	1	-4	0	3	-1	1	1	-2

Correlation Matrix

The first analytical step in Q methodology involves constructing a correlation matrix that reflects the relationship of each Q-sort with every other Q-sort. For each pair of Q-sorts, the correlation is calculated by first taking the difference between their item scores (D) and then squaring these differences (D^2). These squared differences are summed across all statements to produce a total measure of discrepancy between the two sorts (the Sum of D^2). This total is then compared with the combined sum of squared scores of the two Q-sorts, and the ratio between these values is subtracted from 1.00. The resulting coefficients expresses the correlation as a value between −1.00 and +1.00 (Brown, 1993). These coefficients indicate how strongly each pair of Q-sorts aligns or diverges, expressing the extent to which participants share similar or contrasting viewpoints (Exel and Graaf, 2005): a perfect positive correlation ($r = +1.00$) indicates identical sorting configurations, whereas a substantially negative correlation (e.g., $r \approx -0.67$) reflects a high level of disagreement (Brown, 1993; Brown, 1996).

In this study, the correlations range from strongly negative to strongly positive (approximately –0.41 to +0.80), indicating that participants differ to some extent in how they evaluated the statements. However, many coefficients fall within a moderate positive range (approximately 0.30 to 0.70), suggesting that a substantial portion of participants sorted the Q-set in broadly similar ways. Some correlations are close to zero, indicating pairs of Q-sorts that show no consistent pattern of similarity or opposition. A few moderate negative correlations also appear, reflecting meaningful divergence between certain viewpoints, though none are extreme enough to suggest complete polarisation.

Although the correlation matrix plays a statistical role, it is generally of little intrinsic interest to the researcher (Brown, 1993). Instead, it functions as a necessary way station through which the data must pass before the underlying factor structure can be revealed (Brown, 1993; Donner, 2001). Consequently, interpretation in Q methodology focuses on the extracted factors rather than on the matrix itself, since those factors represent the shared viewpoints among participants.

Table 29: Correlation Matrix

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1.	Contractor / public client	1.00	0.25	0.06	0.06	-0.10	0.05	0.29	0.05	0.08	0.05	0.15	0.22	0.24	0.10	0.10	0.17	0.20	0.07	0.45	0.00	-0.04	-0.16	0.47	0.15	0.22	0.12
2.	Contractor		1.00	0.75	0.47	0.55	0.12	0.76	0.71	0.50	0.55	0.73	0.60	0.48	0.61	0.44	0.35	-0.18	0.61	0.49	0.60	0.35	0.46	0.56	0.46	0.69	-0.19
3.	Contractor			1.00	0.33	0.69	0.20	0.70	0.75	0.67	0.57	0.76	0.48	0.46	0.60	0.51	0.44	-0.16	0.65	0.45	0.72	0.56	0.55	0.34	0.60	0.61	-0.28
4.	Contractor				1.00	0.40	-0.08	0.39	0.35	0.22	0.21	0.36	0.38	0.21	0.16	0.09	0.02	0.05	0.23	0.13	0.10	0.17	0.18	0.39	0.46	0.28	0.11
5.	Contractor					1.00	0.20	0.61	0.68	0.59	0.54	0.65	0.55	0.41	0.49	0.42	0.48	-0.10	0.63	0.29	0.64	0.52	0.62	0.26	0.64	0.54	-0.33
6.	Contractor / public client						1.00	0.36	0.07	0.30	0.04	0.08	0.22	0.01	0.26	0.00	0.33	0.12	0.29	0.35	0.19	0.24	0.39	0.19	0.12	0.35	-0.05
7.	Public client							1.00	0.65	0.63	0.51	0.72	0.59	0.50	0.73	0.51	0.48	-0.03	0.68	0.61	0.58	0.69	0.55	0.56	0.51	0.72	-0.06
8.	Contractor								1.00	0.61	0.65	0.70	0.62	0.57	0.64	0.55	0.43	-0.22	0.65	0.37	0.70	0.60	0.47	0.23	0.46	0.67	-0.13
9.	Public client									1.00	0.50	0.60	0.49	0.39	0.57	0.39	0.41	0.04	0.67	0.31	0.61	0.42	0.45	0.34	0.65	0.65	-0.10
10.	Contractor										1.00	0.62	0.53	0.35	0.63	0.56	0.45	-0.23	0.63	0.27	0.64	0.42	0.47	0.10	0.54	0.58	-0.23
11.	Contractor											1.00	0.59	0.53	0.60	0.44	0.48	-0.10	0.68	0.45	0.70	0.57	0.43	0.37	0.54	0.66	-0.21
12.	Contractor												1.00	0.29	0.49	0.29	0.53	-0.13	0.58	0.46	0.52	0.32	0.44	0.45	0.45	0.68	0.00
13.	Contractor													1.00	0.53	0.41	0.18	-0.17	0.58	0.36	0.48	0.47	0.26	0.27	0.31	0.54	-0.22
14.	Public client														1.00	0.63	0.46	-0.14	0.65	0.72	0.62	0.53	0.43	0.27	0.42	0.64	-0.17
15.	Contractor / public client															1.00	0.23	-0.21	0.53	0.35	0.49	0.57	0.24	0.05	0.38	0.31	0.00
16.	Public client																1.00	0.19	0.37	0.41	0.37	0.23	0.40	0.31	0.29	0.60	0.08
17.	Contractor																	1.00	-0.21	0.04	-0.27	-0.18	0.00	0.23	0.06	-0.02	0.22
18.	Public client																		1.00	0.42	0.80	0.50	0.59	0.32	0.52	0.68	-0.23
19.	Contractor																			1.00	0.40	0.29	0.24	0.45	0.30	0.49	0.00
20.	Contractor / public client																				1.00	0.49	0.55	0.16	0.44	0.59	-0.41
21.	Public client																					1.00	0.46	0.14	0.35	0.46	-0.02
22.	Public client																						1.00	0.21	0.42	0.55	-0.25
23.	Contractor																							1.00	0.30	0.54	0.06
24.	Contractor																								1.00	0.45	-0.08
25.	Contractor																									1.00	-0.12
26.	Public client																										1.00

Factor Extraction

After constructing the correlation matrix, factor extraction is performed to identify groups of Q-sorts that correlate strongly with one another. Each resulting factor represents a shared viewpoint held by a subset of participants. This step reduces the complexity of the data by revealing the main patterns of meaning that structure the relationships between Q-sorts (Brown, 1993; Duncan Millar et al., 2022; Exel and Graaf, 2005).

To extract these factors, Q-methodology commonly uses either Centroid Factor Analysis (CFA) or Principal Component Analysis (PCA) (Webler et al., 2009). CFA is the traditional approach and offers researchers greater interpretive flexibility. PCA, by contrast, provides a more structured and reproducible way of identifying the main patterns in the Q-sorts. It is widely used because it is available in major statistical programs and has been shown to produce reliable factor structures that are comparable to those of other extraction techniques (Akhtar-Danesh, 2017).

Because PCA offers a more statistically robust solution, it was selected in this study to determine the structure of the underlying factor.

For the PCA, the first step is to extract a set of factors. The software's default setting produces eight initial factors, which were used as the starting point. This results in an unrotated factor loadings matrix, shown in Table 30, in which each Q-sort has a loading on every extracted factor. These unrotated loadings indicate how strongly each Q-sort is associated with each factor before rotation is applied.

Table 30: Unrotated Factor Matrix

Participant		1 Factor	2 Factors	3 Factors	4 Factors	5 Factors	6 Factors	7 Factors	8 Factors
1.	Contractor / public client	0.1806	0.6567	-0.2887	-0.3562	-0.1962	0.0777	0.2322	-0.0685
2.	Contractor	0.8118	0.1187	-0.2565	0.0512	-0.2225	0.0278	-0.1589	-0.0398
3.	Contractor	0.8495	-0.1260	-0.0295	0.0875	-0.0485	-0.0781	0.0811	-0.0290
4.	Contractor	0.3819	0.2243	-0.4655	0.5857	0.0556	-0.1747	-0.1936	-0.1377
5.	Contractor	0.7777	-0.1927	0.0994	0.3413	0.0012	-0.0314	0.0660	-0.0009
6.	Contractor / public client	0.2931	0.2467	0.7182	-0.1105	-0.0330	-0.2860	-0.1937	-0.2280
7.	Public client	0.8722	0.2168	-0.0033	-0.0737	0.0694	-0.2240	-0.1074	-0.0138
8.	Contractor	0.8364	-0.1813	-0.1597	0.0242	0.1081	0.1003	-0.0949	0.1802
9.	Public client	0.7517	0.0185	0.1440	0.1507	0.0899	-0.0341	0.2528	-0.0218
10.	Contractor	0.7291	-0.2622	-0.0510	-0.0104	0.0994	0.3817	0.1110	-0.1062
11.	Contractor	0.8449	-0.0326	-0.1438	0.0573	-0.0510	0.0667	0.0544	0.1543
12.	Contractor	0.7180	0.2035	-0.0055	0.1274	-0.0201	0.3583	-0.3102	-0.0838
13.	Contractor	0.6126	-0.0769	-0.2924	-0.2594	-0.1614	-0.2585	0.1050	0.3878
14.	Public client	0.7976	-0.0263	0.0408	-0.3588	0.0979	-0.0056	0.0263	-0.1308
15.	Contractor / public client	0.5982	-0.2435	-0.2229	-0.3511	0.4123	-0.0353	0.1737	-0.1549
16.	Public client	0.5671	0.2854	0.3936	-0.0286	0.1733	0.4587	0.0176	0.2358
17.	Contractor	-0.1356	0.5944	0.2656	0.2425	0.1644	-0.0965	0.5108	0.2300
18.	Public client	0.8384	-0.1497	0.0686	-0.0521	-0.0732	-0.0315	0.0078	-0.0329
19.	Contractor	0.5897	0.4107	0.0375	-0.4471	-0.0598	-0.0418	-0.0172	-0.2677
20.	Contractor / public client	0.7991	-0.3296	0.0951	-0.0918	-0.1776	0.0880	0.0728	-0.0059
21.	Public client	0.6470	-0.2138	0.0158	-0.1378	0.3718	-0.4163	-0.1233	0.1818
22.	Public client	0.6428	-0.1432	0.4367	0.2583	-0.0344	-0.1212	-0.1058	0.0301
23.	Contractor	0.4648	0.6677	-0.1345	0.1139	-0.2593	-0.1249	-0.1007	0.0657
24.	Contractor	0.6571	0.0550	-0.0981	0.3806	0.1395	-0.0335	0.3692	-0.3299
25.	Contractor	0.8273	0.2027	0.1295	-0.0069	-0.1049	0.1019	-0.1329	0.2197
26.	Public client	-0.2139	0.4645	-0.1507	-0.0045	0.7237	0.0726	-0.2518	0.0516

E

Factor Analysis Solutions

Appendix E presents the results of the factor solutions analysed in this study. For each factor solution, ranging from two to five factors, two tables are provided. The first table reports the factor loadings of all Q-sorts, indicating how individual participants load onto each factor and forming the basis for factor interpretation and selection. Rows that are marked indicate Q-sorts that do not load significantly on any factor (non-loaders), while rows marked with an asterisk denote co-loaders, meaning that these Q-sorts load significantly on more than one factor. An 'X' indicates the factor on which a Q-sort has a defining loading. The second table presents the correlations between the extracted factors, offering insight into the degree of similarity or independence between the factors.

Table 31: Factor Loadings 2 Factors

Participant	Factor 1	Factor 2	(Factor 1)^2	(Factor 2)^2	h^2 / 2
1.	-0.0679	**0.6777X**	0.0046	0.4593	0.2320
2.*	**0.7147X**	**0.4030**	0.5108	0.1624	0.3366
3.	**0.8379X**	0.1882	0.7021	0.0354	0.3688
4.	0.2755	0.3467	0.0759	0.1202	0.0981
5.	**0.7950X**	0.1003	0.6320	0.0101	0.3210
6.	0.1846	0.3357	0.0341	0.1127	0.0734
7.*	**0.7357X**	**0.5163**	0.5413	0.2666	0.4039
8.	**0.8457X**	0.1319	0.7152	0.0174	0.3663
9.	**0.6947X**	0.2879	0.4826	0.0829	0.2827
10.	**0.7746X**	0.0179	0.6000	0.0003	0.3002
11.	**0.8000X**	0.2737	0.6400	0.0749	0.3575
12.*	**0.5966X**	**0.4484**	0.3559	0.2011	0.2785
13.	**0.5992X**	0.1488	0.3590	0.0221	0.1906
14.	**0.7536X**	0.2626	0.5679	0.0690	0.3185
15.	**0.6457X**	-0.0119	0.4169	0.0001	0.2086
16.*	**0.4264**	**0.4704X**	0.1818	0.2213	0.2016
17.	-0.3405	**0.5057X**	0.1159	0.2557	0.1859
18.	**0.8361X**	0.1622	0.6991	0.0263	0.3627
19.*	**0.4023**	**0.5954X**	0.1618	0.3545	0.2582
20.	**0.8642X**	-0.0199	0.7468	0.0004	0.3736
21.	**0.6806X**	0.0335	0.4632	0.0011	0.2322
22.	**0.6513X**	0.0978	0.4242	0.0096	0.2169
23.	0.1933	**0.7903X**	0.0374	0.6246	0.3309
24.	**0.5932X**	0.2879	0.3519	0.0829	0.2174
25.*	**0.6988X**	**0.4870**	0.4883	0.2372	0.3628
26.	-0.3668	0.3564	0.1345	0.1270	0.1308
% Explained Variance	40	14			
Defining sorts	18	5			
Distinguishing statements	26	-			

Table 32: Correlation between 2 Factors

	Factor 1	**Factor 2**
Factor 1	1	0.3991
Factor 2		1

Table 33: Factor Loadings 3 Factors

Participant	Factor 1	Factor 2	Factor 3	(Factor 1)^2	(Factor 2)^2	(Factor 3)^2	h^2 / 2
1.	0.0252	**0.7393X**	0.0105	0.0006	0.5466	0.0001	0.2736
2.	**0.7712X**	0.3770	0.0458	0.5947	0.1421	0.0021	0.3695
3.	**0.8368X**	0.0760	0.1798	0.7002	0.0058	0.0323	0.3693
4.	0.3780	**0.4647X**	-0.2324	0.1429	0.2159	0.0540	0.2064
5.	**0.7653X**	-0.0496	0.2525	0.5857	0.0025	0.0638	0.3259
6.	0.0610	-0.0033	**0.8117X**	0.0037	0.0000	0.6589	0.3313
7.	**0.7492X**	0.3768	0.3232	0.5613	0.1420	0.1045	0.4039
8.	**0.8664X**	0.0755	0.0408	0.7506	0.0057	0.0017	0.3790
9.	**0.6685X**	0.1160	0.3547	0.4469	0.0135	0.1258	0.2931
10.	**0.7698X**	-0.0623	0.0804	0.5926	0.0039	0.0065	0.3015
11.	**0.8262X**	0.2039	0.1067	0.6826	0.0416	0.0114	0.3679
12.	**0.6097X**	0.3337	0.2718	0.3717	0.1114	0.0739	0.2785
13.	**0.6513X**	0.1749	-0.1091	0.4242	0.0306	0.0119	0.2334
14.	**0.7447X**	0.1265	0.2607	0.5546	0.0160	0.0680	0.3193
15.	**0.6749X**	-0.0047	-0.1059	0.4555	0.0000	0.0112	0.2334
16.	0.3674	0.2171	**0.6131X**	0.1350	0.0471	0.3759	0.2790
17.*	-0.3576	**0.3977**	**0.3952**	0.1279	0.1582	0.1562	0.2211
18.	**0.8148X**	0.0136	0.2568	0.6639	0.0002	0.0659	0.3650
19.*	**0.4190**	**0.4751**	0.3414	0.1756	0.2257	0.1166	0.2589
20.	**0.8275X**	-0.1659	0.2097	0.6848	0.0275	0.0440	0.3781
21.	**0.6657X**	-0.0626	0.1324	0.4432	0.0039	0.0175	0.2323
22.*	**0.5596X**	-0.1673	**0.5323**	0.3132	0.0280	0.2833	0.3122
23.	0.2576	**0.7471X**	0.2355	0.0664	0.5582	0.0555	0.3400
24.	**0.6156X**	0.2250	0.1219	0.3790	0.0506	0.0149	0.2222
25.*	**0.6860X**	0.3022	**0.4246**	0.4706	0.0913	0.1803	0.3712
26.	-0.3114	**0.4305X**	-0.0442	0.0970	0.1853	0.0020	0.1422
% Explained Variance	40	10	10				
Defining sorts	18	4	2				
Distinguishing statements	17	13	14				

Table 34: Correlation between 3 Factors

	Factor 1	**Factor 2**	**Factor 3**
Factor 1	1	0.2907	0.3676
Factor 2		1	0.1805
Factor 3			1

Table 35: Factor Loadings 4 Factors

Participant	Factor 1	Factor 2	Factor 3	Factor 4	(Factor 1)^2	(Factor 2)^2	(Factor 3)^2	(Factor 4)^2	h^2 / 2
1.	0.1171	**0.8125X**	0.0165	0.0065	0.0137	0.6602	0.0003	0.0000	0.3371
2.*	**0.5871**	0.2532	0.1353	**0.5608**	0.3447	0.0641	0.0183	0.3145	0.3708
3.*	**0.6416X**	-0.0431	0.2777	**0.5053**	0.4117	0.0019	0.0771	0.2553	0.3731
4.	0.0101	0.1709	-0.2029	**0.8279X**	0.0001	0.0292	0.0412	0.6854	0.3779
5.*	**0.4598**	-0.2458	0.3357	**0.6195**	0.2114	0.0604	0.1127	0.3838	0.3842
6.	0.0110	0.0404	**0.8156X**	-0.0885	0.0001	0.0016	0.6652	0.0078	0.3374
7.*	**0.5974**	0.3046	**0.4109**	**0.4413**	0.3569	0.0928	0.1688	0.1947	0.4066
8.*	**0.7148X**	-0.0243	0.1451	**0.4754**	0.5109	0.0006	0.0211	0.2260	0.3793
9.*	**0.4416**	-0.0114	**0.4288**	**0.4794**	0.1950	0.0001	0.1839	0.2298	0.3044
10.	**0.6596X**	-0.1286	0.1745	0.3478	0.4351	0.0165	0.0305	0.1210	0.3015
11.*	**0.6424X**	0.0865	0.2036	**0.5265**	0.4127	0.0075	0.0415	0.2772	0.3695
12.	0.3893	0.2031	0.3382	**0.5158**	0.1516	0.0412	0.1144	0.2660	0.2866
13.	**0.6787X**	0.1928	-0.0237	0.1888	0.4606	0.0372	0.0006	0.0356	0.2670
14.	**0.7691X**	0.1798	0.3576	0.1252	0.5915	0.0323	0.1279	0.0157	0.3837
15.	**0.7632X**	0.0590	-0.0138	0.0620	0.5825	0.0035	0.0002	0.0038	0.2951
16.	0.2318	0.1810	**0.6521X**	0.2170	0.0537	0.0328	0.4252	0.0471	0.2794
17.	**-0.5151X**	0.3158	0.3391	0.1449	0.2653	0.0997	0.1150	0.0210	0.2505
18.	**0.6896X**	-0.0456	0.3555	0.3589	0.4755	0.0021	0.1264	0.1288	0.3664
19.*	**0.4875**	**0.5672**	**0.3973**	0.0203	0.2377	0.3217	0.1578	0.0004	0.3589
20.	**0.7450X**	-0.1982	0.3127	0.2693	0.5550	0.0393	0.0978	0.0725	0.3823
21.	**0.6277X**	-0.0706	0.2166	0.1941	0.3940	0.0050	0.0469	0.0377	0.2418
22.*	0.3048	-0.3004	**0.5912X**	**0.3981**	0.0929	0.0902	0.3495	0.1585	0.3456
23.*	0.0551	**0.6239X**	0.2562	**0.4849**	0.0030	0.3893	0.0656	0.2351	0.3465
24.	0.2984	0.0063	0.1847	**0.6827X**	0.0890	0.0000	0.0341	0.4661	0.2947
25.*	**0.5063**	0.2182	**0.5027**	**0.4308**	0.2563	0.0476	0.2527	0.1856	0.3712
26.	-0.3047	**0.4291X**	-0.0853	0.0030	0.0928	0.1841	0.0073	0.0000	0.1422
% Explained Variance	28	9	13	17					
Defining sorts	11	3	3	2					
Distinguishing statements	9	10	10	6					

Table 36: Correlation between 4 Factors

	Factor 1	**Factor 2**	**Factor 3**	**Factor 4**
Factor 1	1	0.1067	0.3951	0.4028
Factor 2		1	0.1196	0.2263
Factor 3			1	0.1043
Factor 4				1

Table 37: Factor Loadings 5 Factors

Participant	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	$(F1)^2$	$(F2)^2$	$(F3)^2$	$(F4)^2$	$(F5)^2$	h^2 / 2
1.	-0.0013	**0.8337X**	-0.0373	-0.0081	0.1267	0.0000	0.6951	0.0014	0.0001	0.0161	0.3563
2.*	**0.4451**	**0.4409**	0.0820	**0.5603**	-0.2793	0.1981	0.1944	0.0067	0.3139	0.0780	0.3955
3.*	**0.5800**	0.1282	0.2426	**0.5083**	-0.2799	0.3364	0.0164	0.0589	0.2584	0.0783	0.3743
4.	0.0202	0.1348	-0.2052	**0.8237X**	0.1409	0.0004	0.0182	0.0421	0.6785	0.0199	0.3795
5.*	**0.4429**	-0.1034	0.3228	**0.6253X**	-0.2576	0.1962	0.0107	0.1042	0.3910	0.0664	0.3842
6.	0.0206	0.1068	**0.8082X**	-0.0919	-0.0489	0.0004	0.0114	0.6532	0.0084	0.0024	0.3380
7.*	**0.5770**	**0.4020**	0.3666	**0.4339**	-0.0294	0.3329	0.1616	0.1344	0.1883	0.0009	0.4090
8.*	**0.7044X**	0.0932	0.1125	**0.4763**	-0.1613	0.4962	0.0087	0.0127	0.2269	0.0260	0.3852
9.*	**0.4552**	0.0790	**0.4090**	**0.4781**	-0.0874	0.2072	0.0062	0.1673	0.2286	0.0076	0.3085
10.	**0.6550X**	-0.0089	0.1489	0.3509	-0.1964	0.4290	0.0001	0.0222	0.1231	0.0386	0.3065
11.*	**0.5725**	0.2423	0.1626	**0.5269**	-0.2258	0.3278	0.0587	0.0264	0.2776	0.0510	0.3708
12.	0.3525	0.2979	0.3067	**0.5116**	-0.0696	0.1243	0.0887	0.0941	0.2617	0.0048	0.2868
13.	**0.5500X**	0.3651	-0.0772	0.1897	-0.2870	0.3025	0.1333	0.0060	0.0360	0.0824	0.2800
14.	**0.7481X**	0.3029	0.3099	0.1211	-0.1216	0.5597	0.0917	0.0960	0.0147	0.0148	0.3885
15.	**0.8606X**	0.0515	-0.0400	0.0571	0.1087	0.7406	0.0027	0.0016	0.0033	0.0118	0.3801
16.	0.2951	0.1956	**0.6370X**	0.2085	0.1196	0.0871	0.0383	0.4058	0.0435	0.0143	0.2944
17.*	**-0.4079**	0.1549	0.3598	0.1319	**0.4369**	0.1664	0.0240	0.1295	0.0174	0.1909	0.2640
18.	**0.6163X**	0.1474	0.3158	0.3622	-0.3249	0.3798	0.0217	0.0997	0.1312	0.1056	0.3691
19.*	**0.4137**	**0.6595X**	0.3393	0.0089	-0.0020	0.1711	0.4349	0.1151	0.0001	0.0000	0.3607
20.*	**0.6300**	**0.0526**	0.2722	0.2782	**-0.4951**	0.3969	0.0028	0.0741	0.0774	0.2451	0.3981
21.	**0.7328X**	-0.0598	0.2018	0.1913	0.0627	0.5370	0.0036	0.0407	0.0366	0.0039	0.3109
22.*	0.2963	-0.1552	**0.5861**	**0.4041**	-0.2713	0.0878	0.0241	0.3435	0.1633	0.0736	0.3462
23.*	-0.0675	**0.6966X**	0.2127	**0.4741**	0.0198	0.0046	0.4853	0.0452	0.2248	0.0004	0.3801
24.	0.3358	0.0353	0.1760	**0.6805X**	0.0256	0.1128	0.0012	0.0310	0.4631	0.0007	0.3044
25.*	**0.4304**	0.3750	**0.4592**	**0.4275**	-0.1839	0.1852	0.1406	0.2109	0.1828	0.0338	0.3767
26.	-0.0107	0.0648	-0.0550	-0.0190	**0.8946X**	0.0001	0.0042	0.0030	0.0004	0.8003	0.4040
% Explained Variance	25	10	11	17	8						
Defining sorts	7	3	2	3	1						
Distinguishing statements	6	1	5	3	8						

Table 38: Correlation between 5 Factors

	Factor 1	**Factor 2**	**Factor 3**	**Factor 4**	**Factor 5**
Factor 1	1	0.2612	0.2696	0.4719	-0.1367
Factor 2		1	0.2717	0.2392	0.0941
Factor 3			1	0.1159	-0.0154
Factor 4				1	-0.0371
Factor 5					1

F

Statement Statistics

Appendix F presents descriptive statistics for all statements across the identified themes. For each statement, the table reports the minimum and maximum score assigned across all Q-sorts, the resulting gap between these extremes, the most and least common scores, as well as the average score and standard deviation.

Statements highlighted in red have a standard deviation above 2, indicating relatively high dispersion and greater disagreement among respondents. Statements highlighted in green show a minimum gap of 4 between the lowest and highest scores, suggesting a more limited spread and relatively greater consensus. Gaps printed in bold indicate the maximum observed gap of 8, reflecting statements that were placed at both extremes of the distribution and therefore elicited strongly divergent evaluations.

Table 39: Statement Statistics

Theme	Statement	Min.	Max.	Gap	Most Com.	Least Com.	Average	S.D.
Capability	1.	-4	4	**8**	4	-4	1.77	**2.21**
	2.	-4	4	**8**	-1, -2	1, 3	-0.46	**2.44**
	3.	-4	4	**8**	-1, -2, 0	2, -4, 1, 4	-0.35	**2.21**
	4.	-4	4	**8**	-2, -3	1, 4, -4	-1.54	1.65
	5.	-2	4	6	0	-1	1.12	1.73
Collaboration	6.	-1	4	5	3	4	1.42	1.58
	7.	-3	4	7	2	-2, -3, -1	1.23	1.75
	8.	-4	4	**8**	2	-1, 3	0.85	**2.13**
	9.	-2	4	6	1	-2	1.08	1.52
	10.	-4	4	**8**	-3	2, 4	-1.77	**2.08**
	11.	-4	0	4	-3	-2, -1, 0	-2.54	*1.30*
Culture	12.	-1	4	5	0	2	1.35	1.72
	13.	-2	4	6	2	4	0.96	1.66
	14.	-4	3	7	2, 0	-3, -4	0.50	1.84
	15.	-4	3	7	-3	3	-1.96	1.82
	16.	-4	3	7	-3	0, 3	-1.62	**2.10**
	17.	-4	2	6	-2	2	-1.88	*1.34*
Innovation	18.	-1	4	5	3	-1	2.12	1.48
	19.	-4	3	7	0	-4, 3	-0.62	1.92
	20.	-3	4	7	0, 1	4, 3, -3	0.58	1.58
	21.	-4	4	**8**	-1	-2, 2, 4	-0.23	**2.18**
	22.	-4	3	7	-1	3	-0.96	1.61
Pricing	23.	-4	3	7	-3	0, 3	-2.08	1.81
	24.	-4	4	**8**	-4	3	-1.54	**2.49**
	25.	-4	4	**8**	-1	-2, 4, -4	0.42	1.79
	26.	-1	4	5	1	4	1.35	*1.38*
	27.	-4	4	**8**	-3	0, 1, 4	-2.31	1.81
	28.	-2	4	6	0	-2	1.23	1.88
Risk Allocation	29.	-4	4	**8**	0	4, 3, -3	0.15	1.97
	30.	-3	4	7	3	1, -1	1.58	**2.25**
	31.	-4	3	7	0	3, -2, 2	-0.46	1.84
	32.	-3	4	7	4	-3	1.23	**2.34**
	33.	-2	3	5	1	-1, 0	1.04	1.59
Transaction Costs	34.	-4	1	5	-2	0, 1	-2.08	*1.26*
	35.	-4	4	**8**	-1	4, 0, 3	-0.96	**2.05**
	36.	-4	2	6	-1	1	-1.00	1.81
	37.	-4	3	7	1, -2, 0	-3, 3	-0.81	1.96
	38.	-4	1	5	-2, -1	1	-1.54	*1.42*
Value for Money	39.	-3	4	7	2	-3	1.81	1.55
	40.	-2	4	6	0	-2	0.81	1.72
	41.	-1	4	5	0, 1	4	1.15	*1.29*
	42.	0	4	4	4, 3	0	2.50	*1.24*
	43.	-2	4	6	0, 1	2, 4	0.46	1.75

G

Grids of Perspectives

Appendix G presents the grids of perspectives for the three identified perspectives in this study. Each grid shows the composite Q-sort for a perspective, displaying the relative position of all statements across the full sorting range from –4 to +4. The grids represent the idealised configuration of statements for each perspective, based on the weighted average scores of the Q-sorts that define the perspective.

Statements located at the extreme ends of the grid indicate those that are most strongly rejected or endorsed within a given perspective. Distinguishing statements are marked according to their level of statistical significance, as indicated in the legend. Together, the grids provide an overview of how each perspective evaluates the statements relative to one another and form the basis for the interpretation and comparison of the perspectives presented in the main text.

-4	-3	-2	-1	0	1	2	3	4
27. Conflicts in practice with the idea of "fair work for fair pay".	** ◄ 16. Turns procurement into an overly short and selective	** 3. Fails to reach its full potential because public clients lack	19. Stimulates the use of innovative and sustainable construction	43. Makes investing in a single integrated public	9. Promotes long-term collaboration between the public client	7. Increases the satisfaction of both the public client and the	39. Strengthens the focus on quality and long-term value instead of the	** ► 32. Limits the financial risks for both parties.
** ◄ 10. Improves the project result at too high a project price.	** ◄ 23. Enables contractors to use enthusiasm about the design and	** ◄ 2. Is hindered because public clients lack sufficient knowledge to	** 37. Shortens the total project duration.	21. Delivers more cost-efficient design solutions.	* ► 40. Delivers higher client value.	28. Provides a fair profit margin that aligns with the principle of	1. Reduces design and scope changes during execution.	42. Rewards investing in phase 1 with a more robust phase-2
11. Weakens the commitment of the public client and the contractor due	** ◄ 15. Continues to convey a strong us–them mentality.	4. Works less effectively because attitudes and behaviours do	36. Reduces procurement costs.	5. Requires retaining knowledge within the project team to	* ► 33. Leads to less additional work.	6. Reduces disputes between parties.	** ► 8. Builds trust between the public client and the contractor	18. Improves the practical buildability of the design.
	** ◄ 24. Causes public clients to feel compelled to accept a price	17. Leads to collaboration training placing collaboration	** 35. Shortens the procurement period significantly compared with	** ► 29. Offsets higher initial costs with lower final costs.	* 13. Creates a more positive, motivating and safe project culture.	12. Contributes to a healthier and more resilient construction	* 30. Reduces the risk of cost and time overruns by allowing more	
		34. Involves too many decision-makers at an early stage.	** 22. Provides more innovative solutions due to the longer design phase.	25. Creates through the Go/No-Go moment a balanced incentive to	26. Accepts higher initial costs in exchange for fewer changes	41. Improves the overall quality of the project.		
			38. Simplifies the procurement procedure compared with traditional	14. Rewards preventing mistakes rather than correcting them.	20. Breaks the belief that complexity can only be controlled			
				31. Gives the public client a strong degree of control over the project.				

Figure 7: Grid of Perspective 1

Legend
* Distinguishing statement at $P < 0.05$
** Distinguishing statement at $P < 0.01$
► z-Score for the statement is higher than in all other factors
◄ z-Score for the statement is lower than in all other factors

-4	-3	-2	-1	0	1	2	3	4
** ◄ 19. Stimulates the use of innovative and sustainable construction	34. Involves too many decision-makers at an early stage.	32. Limits the financial risks for both parties.	** ◄ 13. Creates a more positive, motivating and safe project culture.	* ► 10. Improves the project result at too high a project price.	6. Reduces disputes between parties.	12. Contributes to a healthier and more resilient construction	39. Strengthens the focus on quality and long-term value instead of the	** ► 3. Fails to reach its full potential because public clients lack
** ◄ 21. Delivers more cost-efficient design solutions.	27. Conflicts in practice with the idea of "fair work for fair pay".	** ◄ 43. Makes investing in a single integrated public	36. Reduces procurement costs.	33. Leads to less additional work.	** ► 35. Shortens the procurement period significantly compared with	42. Rewards investing in phase 1 with a more robust phase-2	* ► 26. Accepts higher initial costs in exchange for fewer changes	2. Is hindered because public clients lack sufficient knowledge to
** ◄ 37. Shortens the total project duration.	11. Weakens the commitment of the public client and the contractor due	17. Leads to collaboration training placing collaboration	29. Offsets higher initial costs with lower final costs.	* ◄ 41. Improves the overall quality of the project.	31. Gives the public client a strong degree of control over the project.	24. Causes public clients to feel compelled to accept a price	28. Provides a fair profit margin that aligns with the principle of	* ► 30. Reduces the risk of cost and time overruns by allowing more
	** ◄ 22. Provides more innovative solutions due to the longer design phase.	38. Simplifies the procurement procedure compared with traditional	16. Turns procurement into an overly short and selective	7. Increases the satisfaction of both the public client and the	9. Promotes long-term collaboration between the public client	14. Rewards preventing mistakes rather than correcting them.	1. Reduces design and scope changes during execution.	
		8. Builds trust between the public client and the contractor	40. Delivers higher client value.	4. Works less effectively because attitudes and behaviours do	15. Continues to convey a strong us–them mentality.	5. Requires retaining knowledge within the project team to		
			23. Enables contractors to use enthusiasm about the design and	25. Creates through the Go/No-Go moment a balanced incentive to	** ◄ 18. Improves the practical buildability of the design.			
				20. Breaks the belief that complexity can only be controlled				

Figure 8: Grid of Perspective 2

Legend
* Distinguishing statement at $P < 0.05$
** Distinguishing statement at $P < 0.01$
► z-Score for the statement is higher than in all other factors
◄ z-Score for the statement is lower than in all other factors

-4	-3	-2	-1	0	1	2	3	4
** ◄ 3. Fails to reach its full potential because public clients lack	27. Conflicts in practice with the idea of "fair work for fair pay".	* 10. Improves the project result at too high a project price.	8. Builds trust between the public client and the contractor	16. Turns procurement into an overly short and selective	** ► 37. Shortens the total project duration.	41. Improves the overall quality of the project.	* ► 13. Creates a more positive, motivating and safe project culture.	* ► 1. Reduces design and scope changes during execution.
* ◄ 38. Simplifies the procurement procedure compared with traditional	29. Offsets higher initial costs with lower final costs.	31. Gives the public client a strong degree of control over the project.	23. Enables contractors to use enthusiasm about the design and	21. Delivers more cost-efficient design solutions.	26. Accepts higher initial costs in exchange for fewer changes	2. Is hindered because public clients lack sufficient knowledge to	42. Rewards investing in phase 1 with a more robust phase-2	** ► 5. Requires retaining knowledge within the project team to
** ◄ 35. Shortens the procurement period significantly compared with	32. Limits the financial risks for both parties.	17. Leads to collaboration training placing collaboration	14. Rewards preventing mistakes rather than correcting them.	* ◄ 12. Contributes to a healthier and more resilient construction	7. Increases the satisfaction of both the public client and the	25. Creates through the Go/No-Go moment a balanced incentive to	** ► 22. Provides more innovative solutions due to the longer design phase.	18. Improves the practical buildability of the design.
	34. Involves too many decision-makers at an early stage.	** ◄ 28. Provides a fair profit margin that aligns with the principle of	** ◄ 6. Reduces disputes between parties.	40. Delivers higher client value.	20. Breaks the belief that complexity can only be controlled	43. Makes investing in a single integrated public	39. Strengthens the focus on quality and long-term value instead of the	
		36. Reduces procurement costs.	* ► 11. Weakens the commitment of the public client and the contractor due	33. Leads to less additional work.	19. Stimulates the use of innovative and sustainable construction	24. Causes public clients to feel compelled to accept a price		
			4. Works less effectively because attitudes and behaviours do	** ◄ 30. Reduces the risk of cost and time overruns by allowing more	9. Promotes long-term collaboration between the public client			
				15. Continues to convey a strong us–them mentality.				

Figure 9: Grid of Perspective 3

Legend
* Distinguishing statement at $P < 0.05$
** Distinguishing statement at $P < 0.01$
► z-Score for the statement is higher than in all other factors
◄ z-Score for the statement is lower than in all other factors

H

AI statement

This thesis was developed with the support of generative artificial intelligence ChatGPT and NotebookLM, which were used as an assistive aid throughout the research and writing process. The use of AI was limited to supportive and non-decisive activities and did not replace the author's own analytical judgment, methodological choices, or responsibility for the content of this thesis.

AI tools were used to support the research process in the following ways. They were used as a source of inspiration for chapter titles and section headings, and to assist in drafting, revising, and refining text for clarity, structure, and academic tone. AI was also used to translate and rephrase statements and passages, including the translation of Dutch-language material into English.

In addition, AI was used to support exploratory searches for publicly available and grey literature, which were subsequently assessed, selected, and verified by the author. AI assistance was further used in the preparation and formatting of tables and figures in LaTeX, as well as in helping to improve the overall layout and consistency of the document.

During the application phase, AI tools were used to assist in summarising interview transcripts and other textual materials, helping to transform raw transcripts into more concise and usable summaries. These summaries served as preparatory material for analysis and interpretation, which were conducted independently by the author. AI was also used as a brainstorming partner to actively reflect on structure, coherence, and the positioning of arguments across chapters, and to support initial, exploratory reflections on literature and empirical material.

At no point were AI tools used to generate original empirical data, to perform statistical or methodological analyses, or to draw substantive conclusions. All interpretations, analytical decisions, and conclusions presented in this thesis are the responsibility of the author.