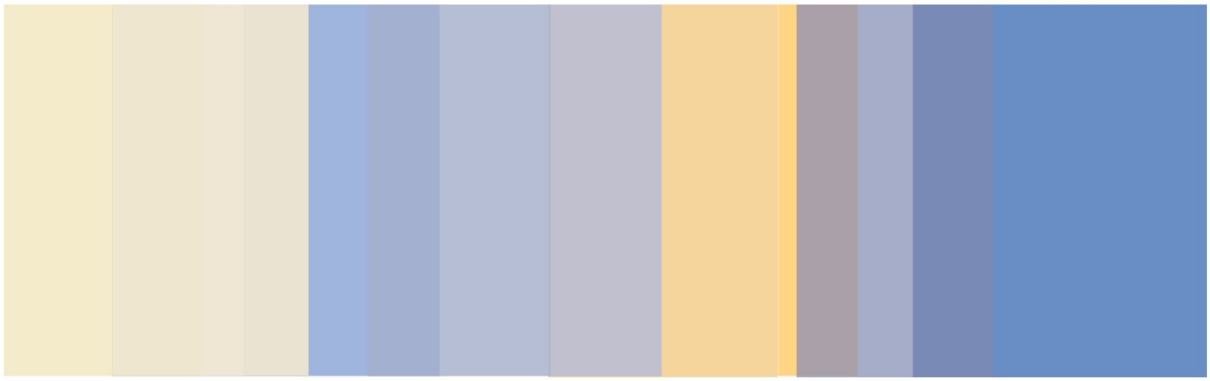
Master Thesis | R. van Riggelen | June 2019

Bouwteam; for more collaboration in the construction industry



anteagroup

TU Delft

‘Put them (the client and contractor) together in one location,

with one shared coffee machine, and 80% of the problems are solved.’

J. Engelhart | senior advisor Antea Group

This thesis was written in partial fulfilment of the requirements for the degree of

MASTER OF SCIENCE (MSc)

in Construction Management & Engineering

At the Delft University of Technology

Colophon

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Study Program: MSc Construction Management & Engineering

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Preface

The thesis before you is my graduation thesis for the MSc Construction Management & Engineering of the faculty of Civil Engineering at the TU Delft. In this thesis the collaborative agreement Bouwteam is studied. In my opinion, collaboration is key for good construction projects, paying more attention to the people who you are involved and less on the money they might make. In a Bouwteam collaboration is the means and the goal. Through a better collaboration within a Bouwteam, you are able to reach a better result in less time and for a smaller budget. That is, however, if the good collaborative relationship between the Bouwteam participants can be established. Collaboration, thereby, becomes the goal during a Bouwteam. It is great to see that the construction industry is making an effort for more collaboration during construction project. I hope that this study will help the participants of a Bouwteam to reach the benefits they aimed for by achieving and maintaining a good collaboration within the Bouwteam, even if it is just for a little bit.

This graduation study has been a long traject in which I have received help from many people. I want to express my firm gratitude to my graduation committee, Hans Bakker, Marian Bosch-Rekveldt, Bauke Steenhuisen en Krispijn de Jonge, for helping me through this process. You were positive and helping and gave me useful feedback to improve my report, even though you had to struggle through a lot of grammar mistakes every time. Special thanks to Marian Bosch-Rekveldt for your time and your structuring skills. Thanks to Krispijn de Jonge of Antea Group, for your time and advices about the practice of the projects, next to your busy job.

I am very grateful for the opportunities to learn and for the things I have done in the last eight years. With this graduation thesis, I finish my studies for now. I want to thank my husband, my family, my friend, and above all God, for helping me during this period of developing my talents and exploring myself. I am looking forward to start working and beginning something new. I hope you enjoy reading this thesis.

Kind regards,

Roos van Riggelen
27 June 2019

Executive summary

Bouwteam is a collaboration agreement in which the contracor is involved early on to work together with the client to make a design in which the knowledge of the client and the contractor is used optimally. Through the years the Bouwteam has been influenced by integrated contracts and has been changing in a variety of ways. Nowadays, there is not one standard way of using a Bouwteam anymore.

In the last decade the Bouwteam has increased in popularity and is being used more and more. The Bouwteam is praised for its benefits regarding collaboration and the integrations of the design and constuction, stemming from the early involvement of the contractor. However, practice at Antea Group shows that reaching the benefits of a Bouwteam is not as easy as one would believe. Signing a Bouwteam agreement does not automatically lead to good collaboration or to project succes. More is needed, but what? This study will examine the question:
How can the benefits of the Bouwteam be achieved in construction projects?

An overview of the study method is given in figure 1. To provide the necessary background information for this study, a literature study is used to investigate the Bouwteam. This has resulted in the insight that collaboration is key to reach the benefits of a Bouwteam but is not easily esteblished within a Bouwteam, nor in other contruction projects. Extensive literature studies can be found on how to establish a good collaboration within a team, though few to none mention Bouwteams specifically.
As seen in figure 1, step 1. is the basis for the next steps of this study. It sets the focus on the collaborative relationship between the client and the contractor in a Bouwteam.

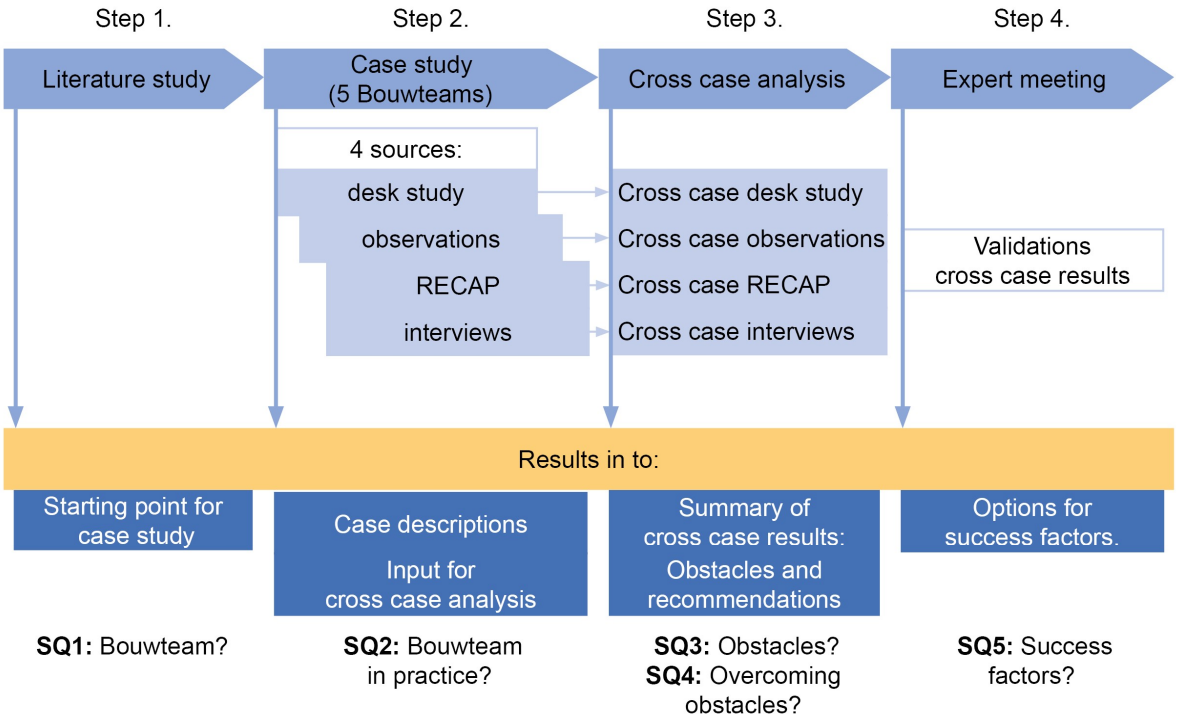

Figure 1; Overview of the plan of this study

For the case study, step 2 in figure 1, data has been gathered from different sources: a desk study, observations, interviews, and RECAP survey. The data from the different sources has been used to create a complete image of five Bouwteam cases. From examining the Bouwteams in practice it has become evident that the processes within a Bouwteam are not always the same. It has also shown that the extent to which the benefits of a Bouwteam are reached can differ greatly from each other. The Bouwteams do not always deliver the expected benefits or meet the expectations which were often the reason to choose for a Bouwteam in the first place. Three of the five Bouwteam cases showed opportunities for improvements. These three partly face similar obstacles, but also project specific obstacles.

All data of the case study is analysed systematically, going through all the Bouwteam phases, and evaluating whether there is a subject that is worth analysing further in relation to the optimisation of a Bouwteam. This resulted in a list of ten subjects: 1) reasons for a Bouwteam, 2) procurement criteria, 3) price element, 4) project start-up, 5) tasks distribution and expectations, 6) collaboration, 7) decision making, 8) openness and honesty, 9) price negotiations and 10) the construction.

A cross case analysis was carried out for each of the different data sources (desk study, observations, interview and RECAP survey, shown in step 3 of figure 1) focusing on the ten subjects, and collecting all the relevant data regarding these subjects. For every subject, a summary is given of the findings of cross case analyses. Based on these findings the researcher came to the following obstacles that could be a point of attention in every Bouwteam, figure 2.

Obstacles of a Bouwteam

- × Inexperienced Bouwteam participants.
- × An unsuitable Project Start-Up (PSU).
- × Wrong formulated tender documents and selection criteria.
- × Traditional attitude of client and/or contractor.
- × Wrong expectations or difference between expectations of participants.
- × Wrong assumptions and misinterpretations of agreements.
- × Minimal investment in the collaborative relationship between the participants.
- × Stagnation of the design phase.
- × Participants are not open and honest about their actions.
- × Late cost estimations and difficult price negotiations.

Figure 2; Obstacles of a Bouwteam

For these obstacles, recommendations are given to optimize a Bouwteam. The ten subjects and the obstacles, with their respective recommendations, have been validated through an expert meeting with three experienced senior advisors from Antea Group. The expert meeting was used to sharpen the recommendations and transform them into success factors which every Bouwteam should aim for to reach the benefits a Bouwteam has to offer, shown in figure 3.

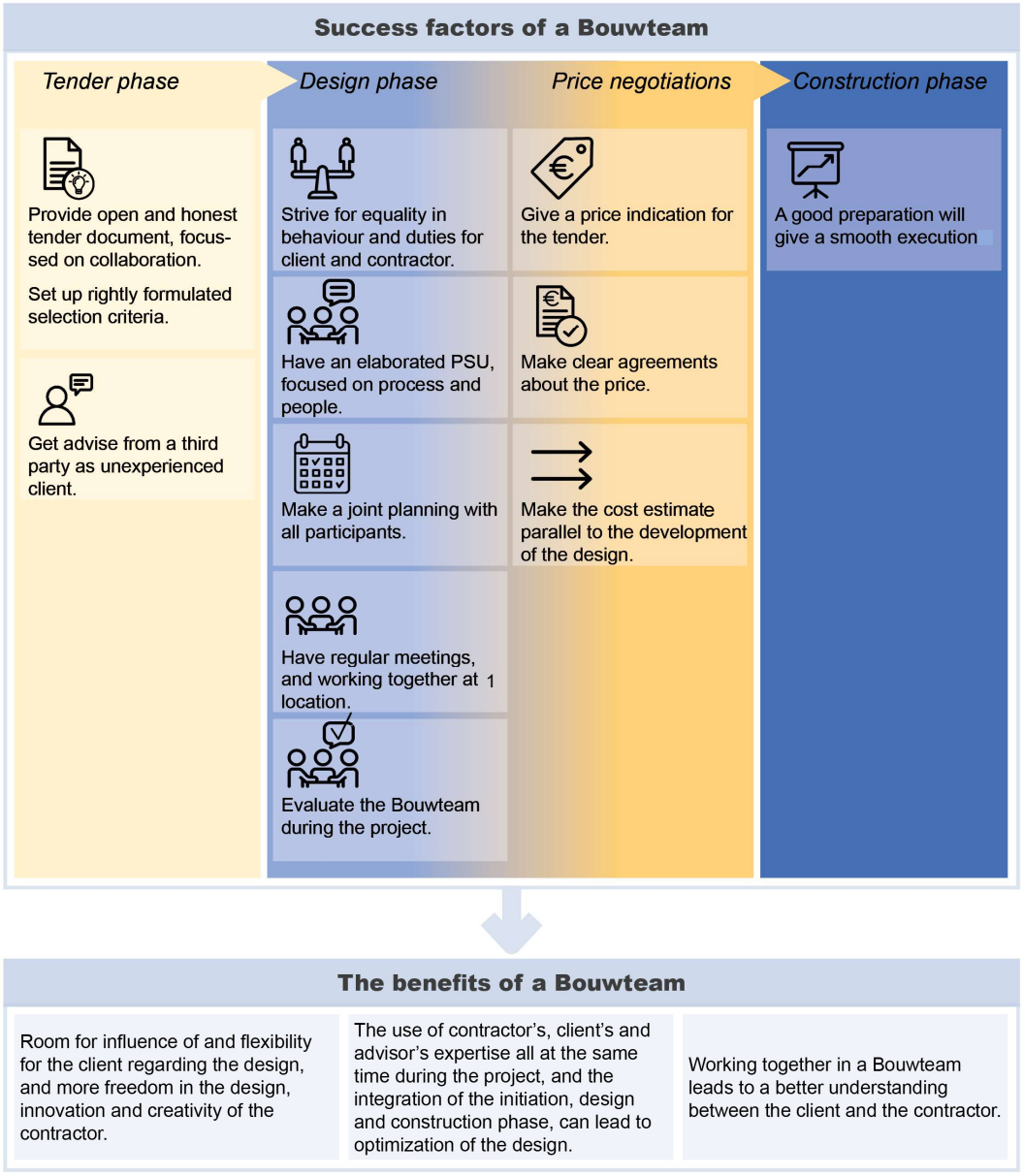

Figure 3; Success factors of a Bouwteam show the way to the benefits

It is recommended to implement the success factors found in this study to achieve the benefits of a Bouwteam. For this to happen it is, however, essential that the Bouwteam participants have knowledge of these success factors and are willing to implement them. To make sure the findings of this study are used, it is recommended to appoint one Bouwteam participant who will steer the Bouwteam in the right direction and is responsible for the collaboration within the Bouwteam. Another recommendation for collaborative agreements in general is the use of the RECAP tool to highlight differences between participants, and make them a possible point of discussion to improve the collaborative relationship. Specific recommendations concerning Antea Group's Bouwteam vision are to use the success factors to supplement their vision. More specifically: adding an extra success factor about the importance of the right kind of PSU and the importance of meeting regularly to stimulate the collaboration and openness within the Bouwteam.

A final recommendation for further research is the validation of the findings of this study through testing them in practice. Making and testing a RECAP tool specific for Bouwteams could be another interesting topic for further research.

Definitions

Bouwteam	A Bouwteam is a collaboration agreement for a construction project in which the contractor is involved in the early phases of the project, and the client and contractor work together to translate the requirements of the client into a constructable design and a matching construction agreement.
Traditional contract	A contract for a project, where the client is providing the design and the contractor is responsible for the construction.
Integrated contract	A contract in which one party is responsible for the design and the construction.
UAV	A contract model often used to procure a traditional contract form.
UAV-gc	A contract model often used to procure an integrated contract form.
E&C (or E&B)	An integrated contract in which the engineering and the construction part of a project are the responsibility of one party.
D&C (or D&B)	An integrated contract in which the design, engineering and the construction part of a project are the responsibility of one party.
Initiative phase	The start-up phase of a project in which the goals and scope of a project are set.
Design phase	The phase in which a design for the project to be constructed is made.
Price negotiation phase	The phase of a Bouwteam in which the client and the contractor negotiate about the price of the project to be constructed.
Construction phase	The phase in which the project is constructed.
Tender phase	The phase in which, in most cases, the client will select a contractor through a procurement.
Bouwteam phase	The phase following the tender phase, in which both client and contractor are involved in a Bouwteam.
Antea Group	A Dutch engineering and consultancy firm with 1800 employees in the Netherlands.
Early Contractor Involvement	A broader term used to indicate construction of building projects in which the contractor is involved early on to support the client in the earlier phases of the project.
Client	Owner of a project.
Contractor	Party with construction as its core business
Advisor	Party involved in a project to add certain knowledge to a team.
Contract	Legally binding document between parties.
Contract model	Standardized form of contract.
Construction contract	A contract, predominantly between the client and the contractor, used for building or construction projects.
Maximum project budget (taakstellend project budget)	The budget available fort the total cost of the project.
Program of requirements (Programma van Eisen)	A set of requirements the client has for the project.
Fight contracts	Construction contracts with a lot off additional work, which end up in a lawsuit about who is responsible and who should pay.
Selective Tendering (Meervoudig onderhandse aanbesteding)	A tendering procedure in which the client is allowed to invite several contractors to do a bid for the job.
Negotiated tendering (Enkelvoudig onderhandse aanbesteding)	A tendering procedure in which only one contractor is able to negotiate with the client, and make a bid. Only allowed under certain circumstances.

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1 | Introduction

1.1 Introduction of research

Background

Recently the Bouwteam has been increasing in popularity in the Netherlands. Bouwteam was introduced in the 1950s to be able to build faster and cheaper through the help of a contractor in the design phase (Koning, 2001; van den Berg, 2010). In the years that followed, the Bouwteam became more widely used, especially in large, complex projects (van den Berg, 2010). In 1992 the Bouwteam became a standard choice on the Dutch construction contracts menu with a standardized Bouwteam contract model by VGBouw (Chao-Duivis, 2012). The Bouwteam became less popular after being associated with the 'bouw fraude' of 2002, but started to rise again not long after (De Koning, 2018). The Bouwteam has since then been rediscovered and is an attractive contract model used more and more (Koenen, 2017). This increasing popularity is clearly seen on industry related websites or in construction related news articles, amongst others from Cobouw, CROW, Bouwend Nederland, and Pianoo (Chao, 2018; Koenen, 2017; Luiten, 2018). Here the Bouwteam projects seem to be an attractive form of running construction projects, and are praised for several of their benefits (De Koning, 2018; Luiten, 2018; van den Boogaard, 2017). According to the numbers of Aanbestedingsinstituut, which is one of the biggest procurement websites of the Netherlands, this popularity is also reflected in the increase in usage of Bouwteams. In 2017 their numbers showed that only 18 Bouwteams were procured through their institution, whereas in 2018 this number had increased to 26 Bouwteams. It is expected that the increase is even higher for smaller projects, which are procured through Selective Tendering and not through websites like Aanbestedingsinstituut. These numbers are expected to continue to rise further in the coming years (Koning, 2018; Koenen, 2017).

What is a Bouwteam?
A Bouwteam is a collaboration agreement in which the contractor is involved in the early phases of the project, and the client and contractor work together to translate the requirements of the client into a well constructable design and a matching construction agreement. A contractor is first selected through a tender. When the design and matching agreement are finished, the same contractor will be the first and only contractor to make a bid for the construction of the project.

Benefits of a Bouwteam

According to the same construction related news articles mentioned above, Bouwteam can have many benefits. By involving the contractor (and/or other advising participant(s)) early on in the construction project, close collaboration between the client and the contractor is stimulated. Moreover the knowledge of the different participants can be used to optimize the design, and align and prepare the construction project better. A Bouwteam lifts the traditional division between the design phase and the construction phase. This is comparable to integrated projects, but without creating a new separation between the client and the design (Lagemaat, 2015). In the case of a Bouwteam, the client can still be actively involved during the design phase. Overall the Bouwteam is seen as a collaborative way of working which, in theory, has many benefits. These benefits are especially useful for projects with some degree of complexity, such as time pressure, a tight budget, no scope definition, large risks, or uncertainties (De Koning, 2018; Koenen, 2018). A Bouwteam in turn can lead to improved planning, proper cost estimate, constructability and risk management, and can reduce errors and changes in the construction phase (Sødal, Lædre, Svalestuen, & Lohne, 2014).

A Bouwteam could potentially be able to solve some of the problems the Dutch construction industry is currently facing. One of those problems is the lack of integration of the different construction phases in a construction project. Recently the construction industry has been in the news negatively. Several incidents have occurred which have questioned the organisation of the whole industry (Onderzoeksraad voor Veiligheid, 2018). The Onderzoeksraad voor Veiligheid (OVV) wrote a report and concluded that the construction industry and different project phases are too fragmented, which leads to problems reflected in, amongst others, safety. The fragmentation and the lack of integration of the different project phases is often seen as one of the main problems in the industry, especially for more complex construction projects (Doree, 2001; ten Hoeve, 2018). This not only causes safety and quality problems, but is also seen as the main reason of failure costs and time overrun by the Dutch research institution KennisBank BV. (Chao-Duivis, 2012; Doree, 2001; Sødal et al., 2014).

General problems
Aside from the fragmentation and lack of integration in the Dutch construction industry, another much-discussed subject in construction literature worldwide is collaboration (ten Hoeve, 2018)(Suprapto, 2016). Suprapto has done an extensive study at TU Delft, examining several studies in which over a hundred projects around the world were analysed. Suprapto found that both industry analysts and project management scholars agree that more effort is needed in client-contractor collaboration to improve the overall project performance. Today's level of collaboration in the construction industry is too low and can have a negative effect on project performances (Suprapto, 2016). That more collaborations wanted, can also be seen in the 'The Marktvision 2016', a document set up and signed by Rijkswaterstaat and several big construction related companies, amongst others, states that people working in the construction industry would like to see more collaboration (Kernteam Marktvisie, 2016).

Potential of Bouwteam & missing gaps
The vision of a Bouwteam meets this call for more integration of the building process and more collaboration between client and contractor in the construction industry. In theory the Bouwteam works well for many projects with a complexity factor in which integration of the process and more collaboration between the client and the contractor is wished for. However, as is shown in practice at Antea Group, simply signing the Bouwteam contract is not enough to establish a well functioning Bouwteam. Through preliminary meetings with employees of Antea Group involved in Bouwteams, it became clear that the process of a Bouwteam does not always run as smoothly as expected, and that struggles in a Bouwteam are common. Some of the struggles mentioned are long price negotiations without result, constantly changing the design, discussion about made agreements (Boijens, 2008), missing information at moments of decision making, distrust, time loss, budget over run, reduced quality, and unsatisfied parties (orientation meetings).

1.2 Context
In this study the operation of the Bouwteam of today will be analysed more closely. This is done primarily through case studies of five currently running, or recently finished, Bouwteam projects. This study is done in collaboration with Antea Group, an engineering and consultancy firm with 1800 employees in the Netherlands. Antea Group has experience in working with Bouwteams. Antea Group is involved in different kinds of Bouwteam projects. Big projects like the restoration of the Domtoren in Utrecht, but mostly medium and smaller projects like the renovations of a viaduct in Haarlem, and the construction of a fish passage in Doetinchem.

Projects and corresponding documents available at Antea Group will be used by the researcher of this study to analyse the Bouwteam. The projects available are mainly construction projects in which Antea Group has an advisory role.

Antea Group

At Antea Group, they have noticed an increase in demand on Bouwteams, but have also had to conclude that the 1992 Bouwteam vision and contract model of VGBouw as it is now, often does not fit the current demands or deliver the promised benefits of a Bouwteam. Therefore, Antea Group is currently developing their own new Bouwteam vision and standardized contract to be able to better show their clients how a Bouwteam works, and what it can mean for a project.

This Bouwteam vision has been developed over the last year by a selected group of Antea Group employees, who have extensive experience in working with Bouwteams. Their goal is to develop a Bouwteam contract that is more fitting to today's demands, as well as deliver the supporting vision behind this 'new' Bouwteam way of working.
The new vision is primarily based on the work experience of this core team of Antea Group employees. They have seen how the Bouwteams work in practice, what can be done to improve the Bouwteam process, and which obstacles need to be tackled to be able to reach project success. Most of the aspects written down in the vision were already applied in the different Bouwteams at Antea group. However, the coming together of these employees, and the bundling of their experiences with Bouwteams, is what led to this new vision. The full Antea Group Bouwteam vision can be found in Appendix G.

New Bouwteam vision

In short, the new Antea Group Bouwteam vision describes the different phases of a Bouwteam, as well as the reasons to choose for a Bouwteam, and seven success factors, which, according to Antea Group, need to be met for a successful Bouwteam. These seven success factors are described as follows:
1) Customization: Finding the right contract form fitting the project and adjusting this contract to the needs of the project.
2) Think forward: Start thinking about the construction phase whilst in the design phase.
3) Task distribution: Making sure to make a clear task distribution, writing down who is responsible for what.
4) The best partner: A Bouwteam needs a partner who is willing to collaborate and who can collaborate. For a Bouwteam it is important to find a partner that is able to understand the client's needs.
5) Traceability of decision making: decisions can have influence on time, budget and risks. Writing down how, and based on what assumptions or information, the choices are made. This reduces the chance of wrong choices and clarifies who is responsible.
6) Openness about price: Stimulating openness on price.
7) In control: The client stays responsible for the end-result of the project. The client can decide which tasks to procure and which not to procure, but it is important to stay actively involved and in control.

This new Bouwteam vision has only recently been completed and is shared sparsely within Antea Group. It has therefore not yet been validated extensively through the use in several Bouwteam projects. The vision will be compared to the findings of this study to help Antea Group to optimize their vision. The success factors given in the vision are taken as a starting point and will be supplemented or adjusted if the results of this study show more or different success factors to reach the benefits of a Bouwteam.

1.3 Problem statement

Aside from Antea Group's observations, it is shown in an extensive study by the Dutch Institute for Construction Law, Chao-Duivis (2012), that the Bouwteam contract model of 1992 is outdated and needs to be adjusted to the current construction industry (Chao-Duivis, 2012; De Koning, 2018; van Wijck, 2018). That the 1992 Bouwteam contract model does not fit this time any more is reflected in the many variations occurring on this contract model. The contract model is almost never used without modifications (Chao-Duivis, 2012). The variations on the standardised contract model vary in procurement methods, distribution of responsibilities, the leading participant, the moment of involvement of the contractor and in how and when a Bouwteam ends (Chao-Duivis, 2012; De Koning, 2018; Lagemaat, 2015). Moreover, the opinions on how a Bouwteam functions best are also divided (Boijens, 2008; Chao-Duivis, 2012; Lagemaat, 2015).

Specific literature about Bouwteams is not excessive, and mostly written several years ago, before the Bouwteam became more popular. Moreover, these previous studies on Bouwteams often still focussed on the 1992 Bouwteam contract model and the way that was used in practice (Chao-Duivis, 2012). One study that was carried out by Boijens (2008) even developed a tool to guide the Bouwteam process, but this was also more than 10 years ago. In the past the Bouwteam has also been studied in comparison with a Design & Construct method, highlighting positive and negative aspects of a Bouwteam compared to a Design and Construct method (Nielen, 2010). Bouwteam projects have previously also been compared amongst each other to find benefits and drawbacks of this form of collaboration in the construction industry (Lagemaat, 2015). Sødal et al. (2014) did the same through interviews with Bouwteam participants. The shared conclusion of these studies is that there should be more focus on establishing a better collaboration between the client and the contractor, because: *'by working with a Bouwteam without the right mind set and expectations, the benefits which can be gained by using the Bouwteam agreement, disappear'* (Lagenmaat, 2015) and '*The biggest challenge is gaining acceptance and dedication to adhere to new forms of collaboration. A mutual respect and trust between the team members is fundamental to project success.*' (Sødal, 2014).

Hence, it is known in general how to establish better collaboration, but how this translates to the better functioning of a Bouwteam is not so evident. In addition these conclusions are slightly outdated and rely primarily on the Bouwteams based on a 1992 contract model. This study sets out to validate the conclusions mentioned above, to see if these also apply to the way Bouwteams are currently used. In addition, it focusses on finding the 'how' to the 'what', essentially examining the way to implement these conclusions in Bouwteams nowadays. This is investigated through case studies of several real time Bouwteam projects at Antea Group. In this way Antea Group's new Bouwteam vision, based on working experiences of a core team, can consequently be validated with the bundled conclusion of case studies of their own Bouwteam projects.

1.4 Scope

The focus of this study is on the collaboration between the Bouwteam participants in the tender phase till the construction phase. Therefore, the projects analysed for this study will also be examined from the tender phase till the construction phase. Decisions made in the tender phase can have considerable influence on the design phase, and the price negotiation phase and construction phase will be able to show the effects of collaboration in the design phase. For this reason this study will analyse all four phases: tender phase, design phase, price negotiation phase and construction phase. The main focus of this study, however, is on the design phase in which the Bouwteam participants collaborate the most.
In a Bouwteam often three core roles can be identified: the client, contractor, and advisor. Eventhough more participants can potentially be added to the team, the focus of this research will be on these three core participants, since they will almost always be in the

team. Finally the scope of this research includes both Bouwteams that are run according to the 1992 Bouwteam contract model of VGBouw, and Bouwteams of which the processes differ from this contract model.

The term ‘Bouwteam’
The term Bouwteam is often used in different ways. It is used to name the whole project, from the initiative phase till the construction phase, or to name only the phase in which both client and contractor are involved. It can also be used to name the team itself, i.e. the people involved in the Bouwteam’ (Koning, 2001). In this study the term Bouwteam will be used to indicate the entire construction project in general.

1.5 Structure of the report

Chapter 2 presents the main goal of this study and the research questions. Furthermore, the research design is laid out, and an overview is given of the research methodology. This is followed by a more in-depth explanation of the case study, and the different sources for collecting data. In the subsequent chapter (3) the Bouwteam is investigated through existing literature. This literature study focusses on “What is a Bouwteam?”, “How did the Bouwteam develop through the years?”, “What does a typical Bouwteam process look like?”, and “What are the benefits of a Bouwteam and what is seen as important to reach these benefits?”. Chapter 4 gives a collection of the data gathered from analysing five Bouwteam case studies in practice. It gives a description of each of the five Bouwteams, based on the data from the desks study, observations during meetings, interviews with participants, and a survey filled in by the participants. These case studies are subsequently analysed and compared to each other in chapter 5, the cross case analysis. This chapter focusses on ten subjects. These subjects were found to be influential for a Bouwteam by the interviewees and the researcher. A summary of the cross case analysis was presented to three Bouwteam experts from Antea Group. Based on their comments the conclusion on how to improve Bouwteams could be validated and sharpened. Chapter 6 presents the set up and the outcomes of this meeting with Bouwteam experts. The final results of this study are discussed in chapter 7. The conclusion and finally further recommendations can be found in chapter 8.

2 | Research design

In theory, the Bouwteam way of working shows a lot of potential, in practice, however, there is still much room for improvement. This study sets out to investigate how to optimize the Bouwteams in practice. The research design can be seen as an action plan for getting from 'here' to 'there'. 'Here' being the question to be answered and 'there' being the conclusions to be reached (Yin, 2009). In this chapter the research objective is given in section 2.1. The formulated research question and sub-questions can be found in section 2.2, followed by the research methodology in section 2.3.

2.1 Research objective

The goal of this study is to analyse the current state of the Bouwteam, and search for where it can potentially be improved. The study starts out with showing how the Bouwteam was meant to be and how it is used today. It further sets out to find the reasons for the growing popularity of the Bouwteam, its obstacles in practice, and the success factors. Once the obstacles come to light, the next step will be to find how the success factors can be used to overcome the obstacles to be able reach the benefits a Bouwteam has to offer.

2.2 Research question

With the research objective in mind, and based on the problem statement in the previous chapter, the research question to be investigated is:

How can the benefits of the Bouwteam be achieved in construction projects?

This captures the main issue of this research. Sub-questions will divide the research into manageable bricks, to build up to the main question:

SQ1) What is the Bouwteam?
SQ2) How is the Bouwteam applied in practice?
SQ3) What are obstacles for the Bouwteam?
SQ4) How to overcome the obstacles?
SQ5) What are success factors for the Bouwteam?

2.3 Research methodology

This section explains how the sub-questions are answered and how they complement each other and build up to answer the main research question. The link between data to be collected and the research question is the research methodology (Yin, 2009). Figure 4 shows an overview of the research methodology of this study and the way the different data acquisition methods complement each other.

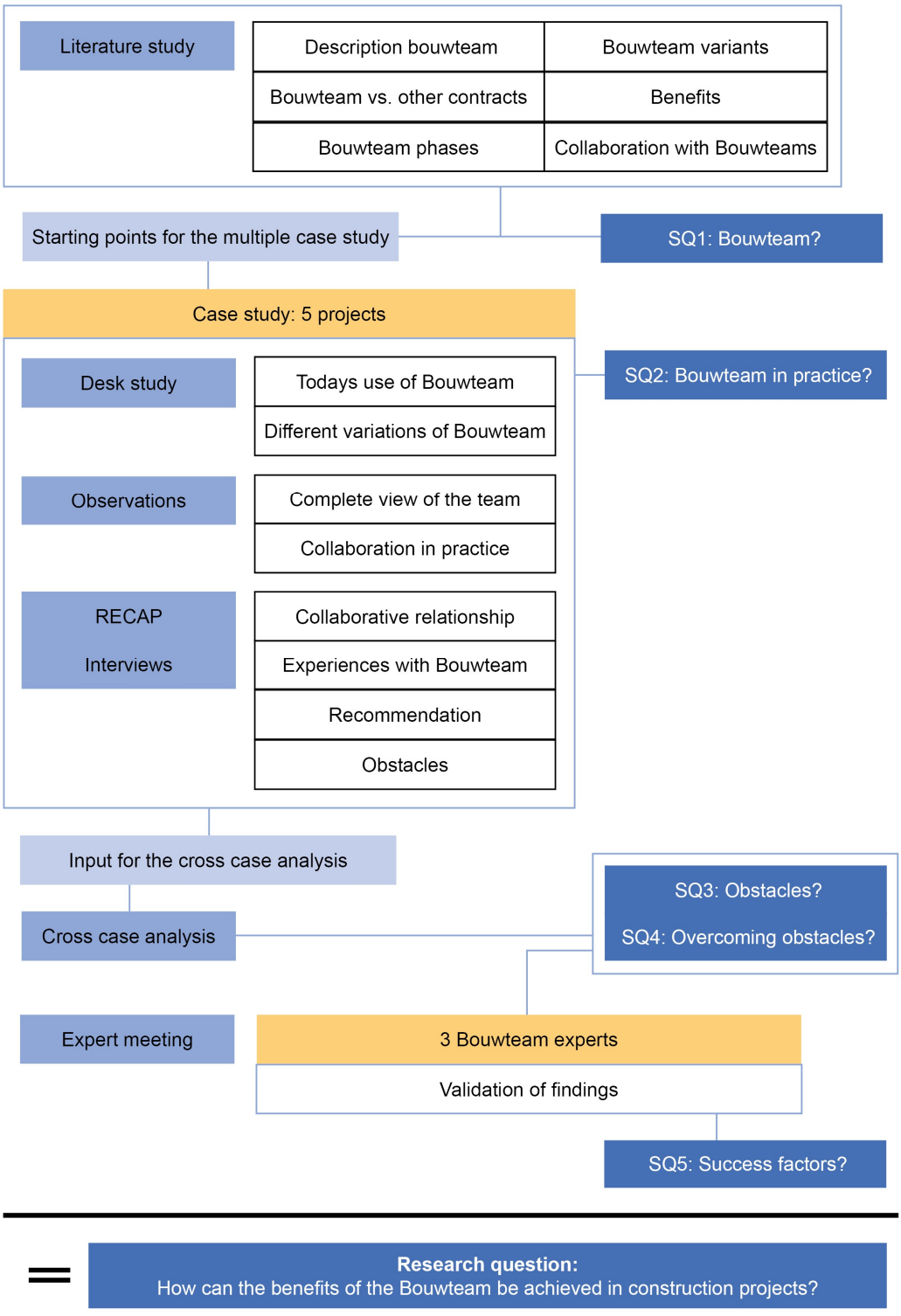

Figure 4; Research methodology overview, own illustration

The literature study lays the foundation for answering the sub-questions. Sub-question 1, “What is a Bouwteam?”, is answered solely based on the data gathered and analysed from relevant literature. Literature about how the Bouwteam currently operates in practice, and literature on the success factors and obstacles will only be used as a preliminary study, to set the focus for the case study. Through the case studies, which will provide five detailed descriptions of how a Bouwteam works in practice, sub-question 2 will be answered fully. Based on finding from literature and the case study, specific subjects, related to the optimizations of Bouwteams, will be selected for which further study through the cross case analysis. Through a comparison of the different Bouwteams on ten selected subjects and a systematic analysis of the data collected through a desk study, observations during meetings, interviews with Bouwteam participants, and the RECAP method, obstacles and recommendations for project success of a Bouwteam in practice are collected to be validated in the expert meeting. RECAP is a method developed by Suprapto (2016) to analyse the collaborative relationship between the client and the contractor and is further studied in chapter 3.

For answering sub-question 5: What are success factors for the Bouwteam? the recommendations are subsequently discussed and evaluated in an expert meeting. The experts consist of three Antea Group employees who have much experience in working with and in Bouwteams. Through adjusting and complementing the recommendations, these are transformed into success factors that can make a Bouwteam succeed and help it reach the benefits it has to offer.

2.3.1 Methodology literature study

Starting with a literature study provides the context for the rest of this study. It forms the basis to the answer of the first sub-question, but also identifies the knowledge gap there is to answer the succeeding sub-questions. In the literature study, different variations on the Bouwteam and their benefits will be analysed. To gain an overview of the research context, comparisons will be made between the Bouwteam and the more traditional contracts and integrated contracts. The benefits of a Bouwteams are studied just as the relations of the benefits to collaboration within a Bouwteam. The literature study will lead to a complete description of “What is a Bouwteam?” answering sub-question 1, but also function as the starting point for the case study, as well as legitimize the results of the case study (Yin, 2009).

To be able to find the suitable and relevant literature, different keywords and synonyms are searched for (i.e. ‘Bouwteam contract’, ‘The Bouwteam agreement (contract)’, ‘Bouwteammodel’, ‘Early Contractor Involvement’, ‘Collaborative contract(ing)’, ‘Contract’, ‘Design Team’). The different keywords are used in several search engines such as Scopus, Google Scholar, and the TU Delft Library options and through repository.tudelft.nl. Through construction related websites and through contact with specialists working for these construction related websites, various organisations like CROW, EIB, Bouwend Nederland, PIANOO, were very useful for finding information about the latest developments of the Bouwteam. They also offered elaborate information about contracts, procurement methods and other construction law aspects.

2.3.2 Methodology case study

A multiple case study is used to collect information about different Bouwteams in practice. This type of knowledge on the operation and functioning of these Bouwteam cases would otherwise never end up in literature. There are several ways of doing a social science research. Yin (2009) writes that ‘every strategy has its own advantages and disadvantages’. Case studies are used when ‘how’ and ‘why’ questions are asked, when a researcher has little control over the events, and when contemporary phenomena in a real-life context have the focus of the research (Yin, 2009). The research question ‘*How can the benefits of the*

Bouwteam be achieved in construction projects?' fits the case study strategy, because the researcher has no control over the Bouwteam projects used for the case study, and because the researcher focuses on a real-life phenomenon.

The unique strength of a case study is the ability to make use of the full variety of the evidence, like documents, artefacts, interviews and observations (Yin, 2009). For this thesis different types of qualitative data are available and used. By following real-time and real-life projects it is possible to gather data through observations and interviews, in addition to acquiring data through a desk study. In this way it is possible to get an up-close, in-depth, and detailed analysis of the projects and their related contextual conditions (Sayed, 2017). During the literature study the research of Suprapto (2016) provided relevant information about the collaborative relationship within construction projects. His RECAP method is used in this case study to analyse the collaborative relationship between the client and the contractor for each of the five Bouwteam cases, as an extra way to collect qualitative data. The collaborative relationship and the RECAP method are discussed in more detail in the literature study, section 3.6. The empirical data from the case study then results in information about what decisions were made, how they were implemented, and with what result (Yin, 2009).

Several case studies are needed to be able to gather different views and compare different Bouwteams. From the available Bouwteams at Antea Group, five Bouwteams were selected to be used as cases for this case study. The projects were selected based on the following *selection criteria:*

- It must be a Bouwteam project in which the contractor works together with the client on the design, and is involved earlier than in a traditional project.
- It must be a running or just completed project.
- It must be a construction project.
- Contract and other documents must be available.
- At least two interviews have to be able to take place, one with the client and one with the contractor of the Bouwteam.

By selecting Bouwteams based on the project selection criteria, the usefulness and relevance of the projects for this study is tried to be ensured. To be able to do a cross case analysis the Bouwteam projects have to be somewhat alike and from the same industry. In chapter 4 the selected Bouwteams are presented in detail.

3 | Literature study

As a first step in this research, the term Bouwteam is explored in the available literature. In section 3.1, the term Bouwteam is introduced on the basis of the first article of the standardised Bouwteam contract model of 1992. It also explains the goal and the specifications for a Bouwteam. Section 3.2 is set out to describe the development of the Bouwteam. It is explained why and how the Bouwteam has changed throughout the years and what this means for the use of the Bouwteam today. Next, in Section 3.3 the different Bouwteam phases are discussed. Literature shows that there are many variations on the process of a Bouwteam, which will be discussed in section 3.4. In section 3.5, the benefits of a Bouwteam are summarised in to three main points. The conclusion from this chapter is that for the Bouwteam to be successful and to fully exploit its benefits, good collaboration between all the parties concerned with in a Bouwteam is key. In section 3.6, the RECAP method is further explained. Section 3.7 gives the answer to sub-question 1 and a short introduction to the topics that need further research. The end of this chapter gives the starting point for the rest of the study.

3.1 Introduction Bouwteam

Based on Article 1 of the 1992 Bouwteam contract model, a full description is given of a Bouwteam (Appendix A):

> *Article 1.*
>
> *The Bouwteam is a collaboration agreement in which the participants - while retaining their independence and responsibility - work together on the preparation of the project. For that purpose, each of the participants is obliged to make the best possible use of their specific experience and expertise.*

Collaboration agreement: The Bouwteam is a project related agreement in which the collaboration between the participants is fundamental (Chao-Duivis, 2012; Lagemaat, 2015). The involved participants consist of at least the client and the contactor, who are both able to involve advisors to support with specific knowledge. Depending on the size of the project and the amount of specific knowledge needed, more participants, such as a designer or environmental manager, can be involved in a Bouwteam (Bruggeman, Chao-Duivis, & Koning, 2007; Chao-Duivis, 2012).

Work together: The reason to opt for a Bouwteam is often the complexity of the project, which requires the client and the contractor to form a team throughout the process. The client wants to be actively involved, because in that way he can influence the design and/or can provide specific knowledge or expertise to the team. At the same time, the client needs the contractor to work together with him, because the client does not have all the required knowledge to make the design himself. The client and the contractor work together and thereby join their forces to come to the best fitting solution.

Independence and responsibility: The collaboration between the participants is on equal terms, but everyone will keep their independence and responsibility for their own assigned part of the project (Chao-Duivis, 2012). All participants should feel the liberty to make suggestions for improving the design, even though it is not their field of knowledge. This is a clear difference from an alliance contract, in which they form a legal entity and everyone is responsible for the entire project (Chao-Duivis, 2012)(van Wijck, 2018).

Preparation: The contractor will be involved in the preparation of the project, to support the client during this part of the project. The preparation of the project can include the orientation, designing and/or engineering of the project (Bruggeman et al., 2007). The involvement of the

contractor is earlier than in a traditional contract. The Bouwteam can be seen as a Dutch version of the Early Contractor Involvement (ECI)(van Wijck, 2018). The goal of this early involvement is to create a design in which the expertise and specific experience of each professional is used. Another reason is to align the design with the construction (Bruggeman et al., 2007; van Wijck, 2018). Early involvement of both the client and the contractor in a Bouwteam contributes to an overall less fragmented project process.

Use of their specific experience and expertise: As mentioned before, the Bouwteam is set up to use the experience and expertise of the participants, who will all have a say in the solution. Ideally, the participants would perform their own duties according to their expertise *and* are involved with the work of the other Bouwteam participants, so they can complement the work of each other (Bruggeman, Chao-Duivis, & Koning, 2010).

The client, contractor and advisor all have their own role in the Bouwteam. The client has been the one who chooses a Bouwteam as a contract form. He is responsible for setting the requirements, conditions and wishes for the Bouwteam and for making the final decisions (Bruggeman et al., 2007). Often the client has knowledge about the project, the surroundings, politics, the history and the stakeholders or residents related to the project (HoPe, 2016). The contractor brings construction experience to the Bouwteam. He has knowledge about the execution, phasing, construction drawings, materials and costs. An advisor can have different specific skill depending on the needs of the project. His role can include advising about aspects such as tendering, cost, planning, technical details, environment, etc. (HoPe, 2016).

3.2 Development of the Bouwteam

The idea of the Bouwteam emerged in the 1950s. The reason to develop the Bouwteam was, according to Koning, the separation between the design and construction phase. Due to this traditional separation, it was almost not possible to benefit from the specific expertise of the contractor (Koning, 2001). In the first years after the Second World War, Bouwteam was introduced because the construction production was not able to provide the number of houses needed. The most important arguments to use Bouwteam were: 1) the shorter preparation phase, 2) a better integration of the technical and organisational aspects of the project and between the design and construction phase, and 3) a smooth building process in general (Koning, 2001). In the years that followed, Bouwteam became more common, not only in the housing sector, but also in the utility construction and the civil engineering sector, especially for large and complicated projects (Koning, 2001). With the 1992 Bouwteam contract being written down by VGBouw (Appendix A) it became a standardized contract.

From the research by Chao-Duivis it can be concluded that, despite the decline in use around 2002 due to the construction fraud in the Netherlands, the use of Bouwteam has been on the rise again. It is a fixed option on the menu of construction contract forms (Chao-Duivis, 2012). Chao-Duivis states that the contract has proven its usefulness, but has become outdated in some points. Nowadays a Bouwteam is almost never used without modifications (Chao-Duivis, 2012).

Traditional contract

A well-known and widely used contract form is the traditional contract. In a traditional contract process, the different process steps are placed on the market individually, based on separate contracts. A client is responsible for a design and will have to make sure the design is according his requirements, possibly with help of a designer. Then the project is procured, often the contractor who bids the lowest price is selected to construct the project. (Arts, 2007) (PIANOo, Unie van Waterschappen, & Deltaplan Waterveiligheid, 2017). During construction it happens regularly that the design needs to be adjusted in order to be executed (ten Hoeve, 2018). This is additional work and not included in the agreed price.

The responsibilities in a traditional contract are as follows: the client is responsible for the entire project, the designer is responsible for the design and the engineer for the engineering part. The construction is exclusively the responsibility of the constructor, but under strict supervision of the client (ten Hoeve, 2018). While constructing the project, the client will check if the contractor works according to the agreed construction specifications, recorded in a 'RAW-Bestek' (van Valkenburg, Lenferink, Nijsten, & Arts, 2008, Bodem-Richtlijn, 2018). The design phase and construction phase are strictly separated in this traditional process (see figure 5) (Bruggeman, Chao-Duivis, & Koning, 2010).

Between 1950 and 2000 the Bouwteam had an approach more similar to the traditional contract than nowadays. The 1992 Bouwteam contract model shows that the client was in charge of the design and responsible for the total project (Koning, 2001). The contractor has an advising role and was often involved in the end stage of the design phase, the engineering part of the design (Chao-Duivis, 2012).

Integrated contract

In the 1990s clients started to outsource more parts of the project to the contractor to use the knowledge of the market and to unburden themselves regarding the engineering, design and risks of the project (ten Hoeve, 2018). Supported by positive experience, this trend of outsourcing developed from performance-based contracts to more integrated contracts forms like Engineering and Construct (E&C) contracts and Design & Construct (D&C) (Lenferink et al., 2013). An integrated contract form is characterized by the incorporation of both the design and the construction and the execution of those two disciplines by one party (see figure 5) (Chao-Duivis, 2012). This results in a more optimal alignment between design and construction (Bremer, 2005). The client plays a less dominant role and the contractor is expected to be more active in comparison to a traditional contract (Bruggeman et al., 2007). The client sets the program of requirements (Programma van Eisen) for the project. After procuring, the contractor will conduct the design and the construction based on these requirements. As a downside, in this way a new separation in the construction process is created, namely between the initiative phase (and the requirements formed in this phase) and the design phase (Nielen, 2010). This problem can be solved by an even more integrated contract named Plan, Design and Build (PDB) (PIANOo et al., 2017) which is seen as a type of Early Contractor Involvement agreement, because the project is procured early and therefore the contractor is involved early on (van Wijck, 2018). This type of integrated contract is not often used, only for projects in which it is important to have knowledge about the construction for the preparation of the design (PIANOo et al., 2017). Another aspect of integrated contracts which is not ideal, and which also holds for PDB, is that the client has less influence on the project when transferring the project to the contractor. The requirements set by the client in the beginning of the project can change or need to be supplemented during the project, because not everything can be known at the beginning of the project (ten Hoeve, 2018). Making changes like this can be difficult because changing requirements can lead to changes in the agreement, resulting in extra cost and/or a delay (Nielen, 2010).

Through the years, Bouwteams have played a small role compared to other contract types, such as the traditional contracts and integrated contracts. The standardisation of the 1992 Bouwteam contract model made it possible to use the Bouwteam more easily (Chao-Duivis, 2012), but the construction fraud of 2002 had put a temporary stop on the increase of the use of the Bouwteam (Boes & Dorée, 2013; Koenen, 2017). The construction fraud made the construction sector harder and less keen on Bouwteam (Boes & Dorée, 2013; Chao-Duivis, 2012). In the period from 2002 until today, the construction sector is slowly regaining trust in each other and seems to become more willing to use more collaborative contracts (Chao, 2018). According to Chao, there are three returning aspects which play an increasingly important role in drawing up a contract (Chao, 2018): 1) negative experience with 'fight

contracts', 2) project complexity and 3) the client who wants to start a project without a complete scope, doesn't have the knowledge to make a design themselves but wants to stay involved in the design phase (Chao, 2018). Because of the increasing importance of those aspects collaboration contracts, like Bouwteam and alliance, gain in popularity (Chao, 2018; De Koning, 2018; Koenen, 2017).

Influenced by the integrated contract forms, clients have become more used to transferring responsibility to the contractor (Bruggeman et al., 2007; De Koning, 2018). Nowadays, the Bouwteam seems to have a more integrated way of working (De Koning, 2018), the contractor is involved in the early stages of a project, initiative phase or design phase, and is often trusted with the leading role in the Bouwteam (De Koning, 2018; Lagemaat, 2015).

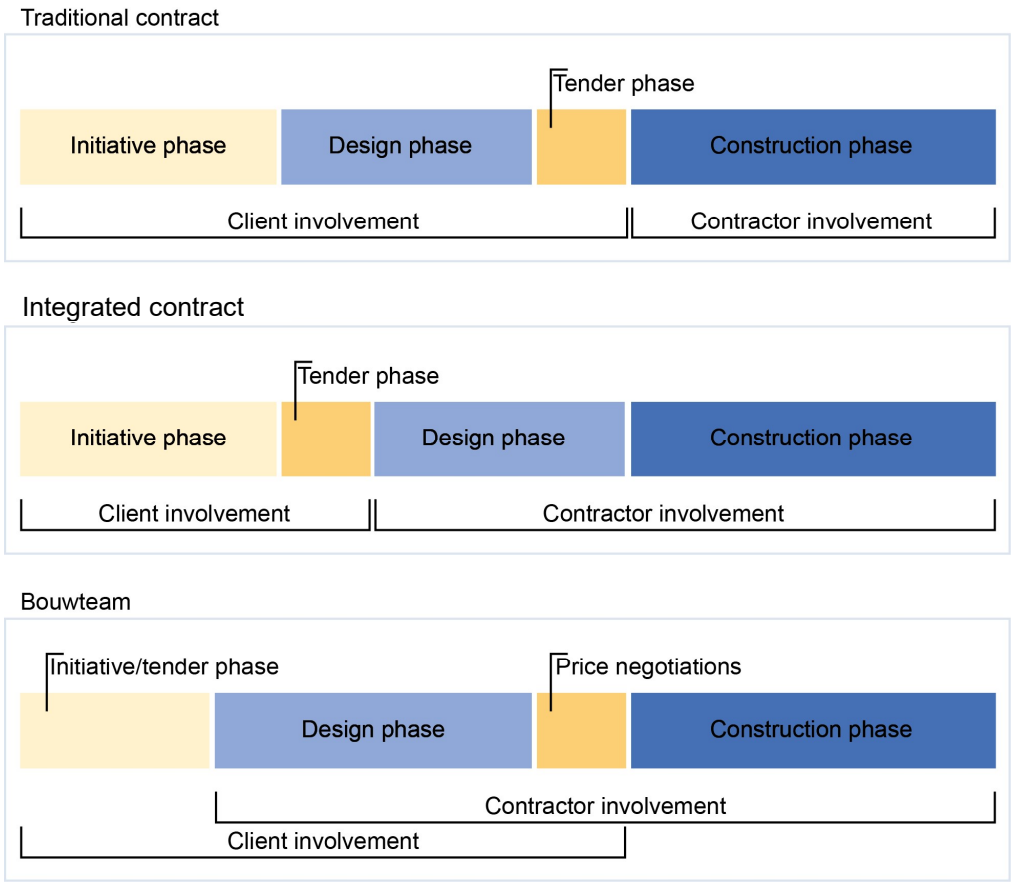

Figure 5; Phases of different contracts, own illustration

Integrated contracts have the advantage of lifting the separation between the design, engineering, construction and sometimes even the maintenance phase (ten Hoeve, 2018). This is a large benefit of an integrated contract, since the fragmentation of the construction process is not always desirable and often seen as the source of several problems in the construction industry faces (Doree, 2001).

This is consistent with the conclusions of the recent research of Onderzoeksraad voor Veiligheid (OVV) from October 2018, conducted after some major incidents in the construction sector. The report of this study shows the problems in safety and quality in the construction sector in the Netherlands. One of the reasons given for failures is the fragmentation of the construction process. The process is divided over different parties with the result that safety risks are not always noticed and management measures are not present. OVV advocates better risk management and a central party that has an overview of the entire project. More integration throughout the process seems to offer solutions for many problems in the building industry (Onderzoeksraad voor Veiligheid, 2018). Less

fragmentation means less transmission from and to different parties, which reduces the chances of miscommunication and misunderstanding and makes it easier to align phases for optimization of the process (Doree, 2001; Nielen, 2010; Suprapto, 2016).

Two contract forms can be compared to a Bouwteam: Early Contractor Involvement (ECI) (van Wijck, 2018) and Alliance (Chao-Duivis, 2012).
Early Contractor Involvement is a broad term used for contracts in which, as the name says, the contractor is early involved. This can be from the very beginning of a construction project, during the design phase or just before execution. The principle is similar to a Bouwteam: by involving the contractor earlier, the client hopes to use the expertise of the contractor to optimize the project (van Wijck, 2018).

In an Alliance, the parties take the integration and collaboration a step further than the Bouwteam. The parties collaborate on equal terms and the client is involved intensively in the building process (Bruggeman et al., 2010). A legal 'alliance organization' is established for the collaboration, where the client and the contractor are partners, working for the same goals. Parties share the benefits and the risks, and surplus is divided over the participating Alliance partners (Bruggeman et al., 2010). This contract form is often used for complex projects where it is hard to know the risks upfront (Bruggeman et al., 2010). In the Netherlands, an alliance collaboration form is mainly used for large projects, because the intensive process organisation is undesirable for a small project (Chao-Duivis, 2012). For a Bouwteam a less intensive preparation and tender procedure is needed. This makes a Bouwteam, in contrast to Alliance, suitable for smaller projects as well as bigger projects (HoPe, 2016).

3.3 Bouwteam phases

Like every construction project, a Bouwteam consists of different phases. Initiative phase, design phase, tender phase, construction phase and maintenance phase are the most standard phases within a construction project (Bruggeman et al., 2007). In a Bouwteam we find these same phases, only in a different order: the tendering phase takes place before the design phase. An overview of the phases is shown in figure 5. The initiative phase is used to explore the different possibilities and set a general course for the project.

'Bouwteam ***phase***'

Frequently, the term Bouwteam is used in combination with the word 'phase', the 'Bouwteam phase'. The Bouwteam phase often indicates the part of the project in which the client and the contractor are both involved. This means that the Bouwteam phase starts at the moment the contractor is involved and ends when the client takes a step back (Chao-Duivis, 2012). The client takes a step back when the design is finished, a construction agreement is signed and the contractor starts the construction phase. The Bouwteam phase can be compared to the design phase. Therefore, to avoid confusion, the term Bouwteam phase will not be used henceforth.

Tender phase
The tender phase is used to find the right kind of contract and tender method to procure the project. When a Bouwteam is selected, the tender method will be adjusted accordingly. The tender is set up to find a suitable contractor to be involved in the Bouwteam (Kamminga, 2011). A frequently used tender procedure for a Bouwteam is the Selective Tendering, in which the client can invite contractors by choice to apply for the job (HoPe, 2016). At least three parties are invited to present their ideas for the project (ARW, 2016). Based on selection criteria set by the client, the applying contractor will hand-in certain documents to satisfy the tender.
Contractors are usually asked to describe the following aspects for a tender: the risks of the project, the opportunities, Plan of Action and their own role in the Bouwteam, including their vision on collaboration (HoPe, 2016). The tender will be awarded based (other than price) on EMVI like criteria, such as experience, collaboration, knowledge and quality (Mndot, 2012).

Design phase
After selecting the right contractor, the team can start with the design phase. The goal of this phase is to investigate different options and come to a design fitting the requirements of the client, which will be captured in construction specifications ('Bestek'). Depending on the specifics of the contract, either the client or the contractor will be in charge of the Bouwteam meetings (Lagemaat, 2015). Both parties, client and contractor, are mostly free to select consultants of their own and bring them into the Bouwteam for specific knowledge needed for designing the project. This is described in article 3 of the original 1992 Bouwteam contract model. During this phase it is normal that the members of the Bouwteam meet regularly to discuss the progress of the design, to inform each other on specific subjects, make decisions and to agree on the following steps to be taken. In some Bouwteams it is agreed to work together in the same room for several days a month (Lagemaat, 2015). The added value of a Bouwteam is especially expressed during this phase, in which the knowledge of the involved parties can be used to optimize the design.

Price negotiation phase
It is typical for a Bouwteam that the contractor who has been involved in de design phase is the only contractor who is allowed make an offer for the construction job (Chao-Duivis, 2012). The contractor will give a price based on the design and provide an open cost estimate to the client. Then the negotiations can start and changes can be made until both parties come to the right price-quality ratio, suitable for both the client and the contractor. If the client and contractor are not able to reach an agreement on the price, the offer of the contractor will be reviewed by a third party. When the third party finds the offer of the contractor unreasonable, the client can dissolve the Bouwteam contract and start a new tender to find another contractor for the construction job. If this happens, the contractor who was involved in making the design, may or may not be compensated for working on the design (HoPe, 2016). It is not desirable for both the client and the contractor, to reach no agreement regarding the price. The client will lose a contractor who had all the knowledge to execute the project and will have to start a new tender, which will cost time and money (Lagemaat, 2015). Also for the contractor is it not desirable to lose the construction job. He already invested significant amount of time and effort in the project and he would probably have been able to construct the project with little risks and little preparation (Chao-Duivis, 2012).

Construction phase
In some projects the participants of the Bouwteam still come together during the construction phase, though this is usually less frequent in comparison to the design phase. Bouwteams in which the UAV contract is used for the construction phase, as suggested by the original 1992 Bouwteam contract, are most likely to complete the construction phase in a traditional way. According to the UAV contract, the contractor is responsible and the client is little involved in the construction phase (Bruggeman et al., 2007; Chao-Duivis, 2012; de Koning, 2018).

3.4 Contract model and variations

In 1992 VGBouw made a standardised contract for the collaboration form Bouwteam. This contract was meant to be a tool during the negotiations between the client and the contractor. It was designed to give specific shape to the legal relationship between the client and the contractor (Chao-Duivis, 2012).

Standardized 1992 Bouwteam contract model

The 1992 Bouwteam contract model is the contractual agreement between the client and the contractor and does not create a contractual relationship between the other Bouwteam participants. Although article 2 of the1992 Bouwteam contract model asks to write down all the Bouwteam participants, there are no further regulations in this contract concerning the other participants (Chao-Duivis, 2012; Koning, 2001). It is possible to make an agreement between all the Bouwteam participants, which is called a co-ordination agreement (Bruggeman et al., 2010). After the definition of a Bouwteam in article 1 of the 1992 Bouwteam contract model, articles 4-6 describe the tasks of the Bouwteam and the duties of the client and the contractor. This is followed by articles 7-10 about documentation and decision-making. Articles 11-13 cover liability, and pricing. The price negotiations and awarding the construction contract can be found in articles 15-21. The last articles are about termination and regulations on disputes (Bruggeman et al., 2010).

Variations on the standard agreement

There is general consensus that the official contract model from 1992 of the Model Bouwteam Agreement is outdated due to the recent revisions of procurement law and related to the arrival of UAV-gc (Chao-Duivis, 2012; De Koning, 2018; van Wijck, 2018). Different variations of the Bouwteam, based on the 1992 contract model, have emerged to substitute the 1992 model. These different forms of Bouwteams result in different forms of collaborations (De Koning, 2018). Variations can be found in: how the contractor is selected, tender selection criteria, when the contractor is involved, how the parties come to a price, how the responsibilities are distributed, who is the leading party within the Bouwteam, what kind of follow-up contract is used, and the degree of involvement of the parties during the construction phase (Chao-Duivis, 2012; Lagemaat, 2015; Nielen, 2010). The most significant differences between variations are discussed.

1) Leading party:

Originally the client is in charge of the Bouwteam and can be represented by a project manager (Bruggeman et al., 2010; Koning, 2001). This original way of the Bouwteam model fits the 1992 Bouwteam contract model. The client has the lead and is responsible for the design and the contractor only has an advisory role. After price negotiation, UAV can be used throughout the construction phase (De Koning, 2018). Once the design phase is closed, the client and contractor go back to the more traditional way of working during the construction phase.

In more recent implementations of the Bouwteam the contractor has the lead, bringing the Bouwteam closer to an integrated contract. An UAV is not tailored to the fact that the contractor is more than an advisor. When the contractor has (some) responsibility for the design an UAV-gc can be used for the construction phase (De Koning, 2018). By giving the contractor the lead in a Bouwteam, the contractor will have a more proactive role throughout the project. The contractor will most likely have more responsibility compared to a Bouwteam variation in which the client has the lead and sometimes even full responsibility for the design. The contractor can be asked to write the construction specifications (bestek) himself. When after the price negotiations the contractor still has design or engineer an UAV-gc contract is the more logical option for the construction phase than an UAV contract (De Koning, 2018).

Due to the increase in popularity of the UAV-gc contract it has become more common to use the UAV-gc following a Bouwteam contract. As a result, the contractor is more in the lead during the design phase and has the responsibility for the design more often (De Koning, 2018). According to Lagemaat's study, the main objection of the client to use the 1992 Bouwteam contract model is the application of the UAV in the construction phase. The UAV is not made to fit the contractor's involvement and responsibility in the design (Lagemaat, 2015).

2) Selection criteria

Variations in the Bouwteam can originate from the different ways in which a contractor is selected for a project. The most commonly used variations are (Chao-Duivis, 2012):

1. Specific prices for materials, equipment and wages and sometimes a total price, and percent mark-ups for general costs, profit and risk issued.
2. No total price, but only percent mark-ups for general costs, profit and risk.
3. 100% quality with a maximal budget given by the client.
4. 100% quality without any price aspect.

Literature shows a discussion about using price elements as a selection criteria for selecting a contractor for a Bouwteam. On one hand it is argued that there must be a price element in the selections, claiming that without competition during the price negotiations, the contractors will simply be able to increases their prices (Chao-Duivis, 2012; Lagemaat, 2015). According to the study of Chao-Duivis, the most commonly used method is to ask the contractor to specify prices for materials, equipment, wages and percent mark-ups for general costs, profit and risk issued, but not a total price (Chao-Duivis, 2012). It is argued that especially for projects with a lot of uncertainty, this will not work out. The prices asked upfront might not be relevant once the design is made and the contractor will be able to ask a higher price for unforeseen materials, risks or unforeseen activities (Lagemaat, 2015; Nielen, 2010).

3) Moment of contractor involvement

In the 1992 Bouwteam contract model the contractor was involved late in the design phase for the engineering part of the projects (Chao-Duivis, 2012). In this way, a Bouwteam looks a lot like a traditional contract, but before the project is procured to the contractor, the contractor will help the client to engineer the design. Nowadays, the contractor is often involved even earlier than the engineering phase (Lagemaat, 2015). The contractor can be involved in the initiation phase to help setting the requirements for the project or the contractor can be involved in the design phase. (Boijens, 2008). The moment when the contractor is involved has influence on the collective design activities (Lagemaat, 2015). The earlier a contractor is involved in a Bouwteam, the more collective activities the contractor and the client will have to perform.

3.5 Benefits of a Bouwteam in relation to collaboration

Literature sums up many benefits regarding the use of a Bouwteam. Those benefits often correspond to the reasons why a client chooses a Bouwteam and why a contractor would want to join a Bouwteam. An extensive list with benefits and their sources can be found in Appendix B. Aside from literature, the construction industry related websites are also very positive about Bouwteam and have equally listed multiple benefits. These benefits are less theoretically substantiated and are more based on experience (Chao, 2018; Kessels & Smit, 2018; Koenen, 2017). A summary of the most frequently named benefits for client and contractor are:

- Within a Bouwteam there is more room for influence and flexibility for the client regarding the design, and more freedom in the design, innovation and creativity of the contractor (De Koning, 2018; Mosey, 2009; Nielen, 2010; Rahman & Alhassan, 2012; van Wijck, 2018).

- The use of contractor's, client's and advisor's expertise all at the same time during the project, and the integration of the initiation, design and construction phase, can lead to optimization of the design. Moreover it can result in an optimal alignment of design and construction, better budget control, better risk allocation, and time profit (Boijens, 2008; Chao-Duivis, 2012; Jansen & Metsemakers, 1999; PIANOo et al., 2017; Rahman & Alhassan, 2012; Scheepbouwer & Humphries, 2011).
- Working together in a Bouwteam can lead to a better understanding between the client and the contractor, a better alignment of goals, more trust, which increases the chances of higher satisfaction for all parties, fewer lawsuits, and reduced disputes (Chao-Duivis, 2012; Hardeman, van Elp, Mulder, & Verwoerd, 2014; Kamminga, 2011; Rahman & Alhassan, 2012; Scheepbouwer & Humphries, 2011).

The benefits of a Bouwteam are related to the early involvement of the contractor, when the client is also still involved. The early involvement of the contractor in a Bouwteam is only beneficial, in comparison to other contract forms, when the client and contractor will be able to bundle their forces and work together to reach a better result. If they will not collaborate and make no use of each other's knowledge, there is no use in choosing a Bouwteam over a traditional or integrated contract. If the benefits of a Bouwteam are wanted, a collaborative relationship between the client and contractor is needed (Boijens, 2008; Lagemaat, 2015). Different studies suggest that more intensive and interwoven collaboration is key to a Bouwteam and the lack thereof will have negative effects. According to Boijens, the collaboration will collapse, and the construction process will stagnate when there is miscommunication and distrust, with adversarial attitudes as a result. It is only possible to establish an optimal collaborative relationship when there is trust, openness and good communication between the participants (Boijens, 2008; Bresnen & Marshall, 2000; Lagemaat, 2015) (Suprapto, 2016).

A good set of formal and legal agreements is beneficial for a Bouwteam or any construction project (Klee, 2018). It makes sure that everyone is on the same page and the legal agreements are useful when the participants cannot come to an agreement during the project (Lagemaat, 2015). From a study in which several examples of the Bouwteam have been analysed, it can be concluded that the formal and legal agreements will only have a positive influence on the collaboration within a Bouwteam when provided in the right proportion (Lagemaat, 2015). However, the legal agreements alone are no guarantee for a positive collaborative relationship (Lagemaat, 2015). Bresnen (2007) and Smyth & Pryke (2008) suggest that the attempts to form a collaborative relationship should be focused more on people and their relationships ten on contractual arrangements.

Through an extended literature study by Suprapto about collaborative relationships, it is shown that even though collaborative relationships are critical to the success of construction projects, the ability to *'sustain and consistently drive the real collaborative attitudes and behaviour for achieving the desired outcomes remains of enduring practical difficulty'* (Suprapto, 2016)(p. 181). More studies agree on this point: '*The biggest challenge is gaining acceptance and dedication to adhere to new forms of collaboration. A mutual respect and trust between the team members is fundamental to project success.*' (Sødal, 2014). According to Suprapto, real collaboration requires 'deliberate relational attitudes' and 'teamworking' within and between the project teams. The focus should be on *'soft and people aspects'* which are '*more influential than the formal application of supporting practices and techniques'* (Suprapto, 2016).

Teamwork and relational attitudes can be realized by affective trust and shared objectives, a no-blame culture and open and honest communication, as well as social interaction, acceptance of conflicting opinions and leadership (Suprapto, 2016)(HoPe, 2016; Lagemaat, 2015). Overall, a more effective collaborative relationship could be achieved through relational attitudes and day-to-day management attention for teamworking (Suprapto, 2016).

Formal agreements are important and help to establish a well functioning Bouwteam, however, it is even more important to stimulate teamwork and a relational attitude.

3.6 Explanation Suprapto's RECAP

Suprapto has done his PhD research about collaborative contracts and developed a method to measure the quality of the collaboration between the client and the contractor. Moreover, his method gives insight in the possibilities for improving the collaboration. His RECAP assessment tool (RECAP = RElational CAPability) is built up as a survey with questions about collaboration, which are filled in separately by the client and a contractor of the same project. This survey will also be used in this study, but the questions are adapted slightly to be a better fit for a study on Bouwteams instead of bigger collaborative contracts like alliances and partnering, for which the tool was initially set up (Suprapto, 2016). Thus, most of the questions of the RECAP tool are used, and translated to Dutch. The full survey (slightly adapted to this study) and made adaptions can be found in Appendix D. Table 1 shows the criteria included in the survey used for this study.
Suprapto's RECAP tool consists of six criteria to measure the relational capability in client-contractor collaborative relationship: 1) front-end definition, 2) collaborative practices, 3) project performance, 4) relationship continuity, 5) relational attitudes and 6) team working quality. Most of these factors are split in to sub-criteria. The sub-criteria 'continuity of the relationship' and 'senior management' have been left out of the survey because these lay outside the scope of this study on Bouwteam. The criteria are developed through a literature study and tested in previous studies of Suprapto. Using the RECAP tool gives the possibility to identify specific aspects for improvement regarding the collaboration. The results from previous empirical tests with the tool show that it indeed helps to diagnose the soft and relational nature of collaboration in real-life projects throughout different project phases (Suprapto, 2016).

Table 1; RECAP criteria used in this study (Suprapto, 2016)

Criteria	Sub-criteria	
Front-end definition	1. Front-end definition	The ability to comprehend the project scope, basic design, execution plan, and roles and responsibilities.
Collaborative practices	2.Team integration	The extent to which the owner and the contractor teams are structured and integrated as a single team with no apparent boundaries.
	3. Joint working processes	The extent to which the owner and the contractor teams perform joint working processes.
Project performance	4. Efficiency	The extent to which the project meets the planned budget and schedule.
	5. Quality	The extent to which the project progressed (or was completed) safely, meeting the targeted quality, reliability and operability.
	6. Satisfaction	The perceived overall satisfaction and business or commercial success.
Relationship continuity	7. Relationship continuity	The perceived intention to continue the relationship in future.
Relational attitudes	8. Established relational norms	Norms of no-blame culture, win-win and communication openness.
Team working quality	9. Communication	The extent of to which the teams communicate with each other effectively.
	10. Coordination	The extent to which the teams achieve synergy in coordinating interdependent activities.
	11. Balanced contribution	The extent to which the teams contribute their specific knowledge and expertise.

	12. Mutual support	The extent to which the teams help each other in achieving project goals.
	13. Aligned effort	The extent to which the teams align their effort.
	14. Cohesion	The extent to which the teams behave as one team.
	15. Affective trust	The extent to which the teams' members personally trust each other.

3.7 Summarizing the theoretical starting points for the case study

Chapter 3 gave a better understanding of a Bouwteam, and provided the information necessary to answer ***sub-question 1: What is a Bouwteam?***

A Bouwteam is a collaboration agreement, with its most characteristic element the early involvement of the contractor (Koning, 2001). In the design phase the client and the contractor work together on the design of the project. In this way the expertise of both parties can be used to optimise the design, in order to have a smooth construction phase afterwards. After the design is completed the contractor, who has already been involved, will be the first and only one to make a bid on the construction job. Only when the client and the contractor do not reach an agreement on the price, the client is allowed to ask other contractors to make a bid for the construction of the project. A Bouwteam follows the same project phases as other construction projects, only in a different order. The tender phase comes before the design phase. This makes it possible to better integrate the design phase and the construction phase, which can have a positive effect on the overall project success.

The way the Bouwteam is being applied has been changing and the construction sector seems to be looking for better ways to use a Bouwteam, and is trying to re-shape the Bouwteam to fit the construction sector of today. The developments in the Bouwteam way of working make that the Bouwteam contract model of 1992 no longer fits this new way the Bouwteam functions (Chao-Duivis, 2012; van Wijck, 2018). The Bouwteam of today tends to be a more integrated way of working, in which the contractor is involved earlier and more actively than is suggested in the Bouwteam contract model of 1992. Variations on the standardized 1992 Bouwteam contract model are used, but without evaluating which variations work best for what is wanted nowadays. The different ways in which a Bouwteam is used nowadays do not always lead to the expected collaboration and project results, according to Antea Group. Too often the benefits of a Bouwteam are not reached in practice. Through the literature study it has become clear that those benefits are strongly dependent on the collaborations between the client and the contractor. The benefits will only be reached when the client and contractor of a Bouwteam establish a collaborative relationship.

Therefore, this study continues the search for how to reach the benefits of a Bouwteam by focusing on the client-contractor relationship. With a case study, Bouwteams in practice will be analysed to find obstacles, which are preventing the client and contractor to establish a collaborative relationship, and find out how these obstacles can be overcome. Suprapto's RECAP method will be implemented (in the interview part of the case study) to find room for improvement within the collaboration between the client and the contractors.

4 | Case study results

This chapter starts with an overview of the methodology of the different ways in which data was acquired from the various Bouwteam cases. The main part of the chapter consists of a detailed summary of the resulting descriptions of the Bouwteams, and ends with a conclusion of each Bouwteam. The fully elaborated Bouwteam descriptions can be found in Appendix E, in which the data gathered from the different sources (desk study, interviews, observations and RECAP survey) is clearly distinguished. In the summaries the data from these different sources is combined to create one complete image of the analysed Bouwteam. The summary contains information about the different Bouwteam phases. Under the header *obstacles/success factors of this Bouwteam*, a description is given of what went well, and what didn't go well, and what the interviewees saw as obstacles or recommends as success factors. At the start of each summary a figure is shown to give an overview of standard facts about that respective Bouwteam. Following the individual case summaries, section 4.8 will give closing remarks.

4.1 Data gathering case study

Desk study

The first step of the case study is to examine the cases available in the field. Documents are studied and contact is made with the Bouwteam leader of the project to see whether it is a suitable case. The documents used for the desk study are mainly acquired through the data base of Antea Group, or will be received from Bouwteam clients. For most Bouwteams the following documents were used to make the project descriptions:

- Request for tender documents (Inschrijvingsleidraad)
- Project planning
- Form internal start meeting (client and Antea Group)
- PowerPoint Presentation Bouwteam.
- Descriptive document Bouwteam.
- Invitation to register.
- Cost estimate before tendering

For every individual case the same data is listed to be able to make useful comparisons later on.

Observations

Observations done at different Bouwteam meetings are used to get a complete image of the relations between the participants within the Bouwteams. By observing the Bouwteam meetings it is possible to analyse the individual Bouwteam participants in a group. This observation data can later on be used to fill in the gaps in the information received from the different participants through the interviews. It can also be used to validate the information of the interviews, which can be subjective since the interviews are held individually. Aside from gathering more data to create a more holistic image of the Bouwteams, the observations are also a stepping stone for the interviews. Notable comments or events happening during the meetings can be evaluated during the interviews.

When observing a meeting of one and a half hours it is important to have a focus. It is possible to write down the entire dialog, but is that useful? In the book of (Yin, 2009) on Case Study about observations, a warning is given not to collect endless data without being able to draw conclusions from it. Since it is possible to observe the whole team working together during a meeting, observations can be used to analyse the collaboration between these participants. Baarda (2014) writes: "When it comes to behaviour, it is best to use observations". Therefore, the focus of the observations has been set on the collaboration between Bouwteam participants. This has been done with the assistance of two senior advisors from Antea Group, who are coaches in collaboration. In a meeting there are always

three kinds of information present which have influence on the interaction: content, procedure and relationship/process (Kessels & Smit, 2018). Since this study focusses on collaboration it is less relevant to concentrate on the content and procedure. During the observations the focus will therefore be on the relations between the participants, and on the process of the meeting, and less on the procedure and the content.

Thus, during the observations at meetings the observer will write down what happens, with the focus on the relations and processes. This is often an unstructured observation and the transcript is analysed later. If possible, the observer attends several meetings of every Bouwteam case. The participants attending the meeting will have been informed about the study and the observer, and the observer will not interfere in the meeting. It is expected that the presence of the observer has negligible influence on the behaviour of the people present, because the observer is a student without a stake in the matter. The transcript of the observations will be as objective as possible. In this way, a different perspective on the functioning of the Bouwteam is generated, which is different from that of the interviewees, who are suspected to be more subjective.

Interviews

Aside from the more general data collected through the observations, individual interviews give the possibility to collect more personal and detailed data. With the interviews, data about attitudes, opinions, feelings, thoughts and knowledge is collected from the interviewees (Baarda, 2014). The interview is a good method to acquire qualitative data, making it an essential element in this research to obtain information from field experts (Spruijt, 2016). The client and the contractor of the selected Bouwteams are interviewed with (almost) the same set of questions. A few interview questions are adapted to the difference in role between the client and the contractor, but are in essence the same. When possible, more interviews are conducted with other Bouwteam participants, such as an advising party. The goal of the interviews is to get a better understanding of the functioning of a Bouwteam in practice. By asking the interviewees to share their knowledge and experience, extensive data can be gathered to adequately answer sub-questions 2, 3 and 4.

The interview is structured, meaning the questions and the order of the questions are fixed. With this structured interview it is possible to obtain similar information from every interviewee, making it better to compare the results in the end (Dingemans, 2015). To get an insight in how well the project is going, the interview includes questions about the standard requirements of a project, questions about time, cost, and quality. The interviewees are asked about their personal experience within the project, and their satisfaction about the collaboration, teamwork, and attitude of the other participants, as well as the atmosphere of the project. This is because, collaboration, attitude and atmosphere all influence each other (Kessels & Smit, 2018) and are strongly related to the success of a project (Suprapto, 2016). The structured question list can be found in Appendix C.

Analysis of interviews

The transcripts of the interviews are sent to the interviewees to check the answers given by them. If deemed necessary by the interviewee, adjustments can be made to the answers. At least two interviews will be conducted per Bouwteam. The data received through the interviews will be analysed and compared on different levels:

1) The interviews of the client and the contractor are first analysed separately.
2) The two (or more) interviews within the same Bouwteam project are compared. The differences and similarities between the client and the contractor's answers are stated in the Bouwteam case descriptions.
3) The results of all interviewees are comparted to each other. This is the cross case analysis and the results will be shown in chapter 5.

The interview transcripts are analysed first by labelling relevant parts. A part will be labelled when it is repeated several times, if it is surprising, or when an interviewee states it is important. It may also be labelled when something similar is stated in a previously published research, or when it seems linked to a theory or concept (Löfgren, 2013). Important to keep in mind all throughout is the risk of interviews: the method is sensitive to bias (Spruijt, 2016).

4.2 Realization of case study

From the Bouwteams Antea Group is involved in, five were finally selected as cases for the case study, based on the criteria shown in section 2.3.2. Often a Bouwteam could not be used because it was not possible to interview both the client and contractor of the Bouwteam. One separate case, which should have been a sixth case, was not included in the case study because the contract was dissolved halfway the design phase. Even though several observations had taken place and the client was still interviewed, the contractor was not available to be interviewed. Data gathered during these observations are still used as examples in the cross case analysis. For the five cases used for the cross case analysis, all clients and contractors were interviewed.

Observations

It was not possible to attend meetings for all the cases, but nonetheless, sufficient data was gathered to be able to make a fitting description of all the Bouwteam cases. It did prove to be quite difficult to be allowed to make observations at the different Bouwteams. The Bouwteam participants were not always eager to give an insight in the project meetings. Usually the clients didn't agree, even though the contractors did not mind. Five observations have been carried out in total, of which two were during the contractor selection meeting in the tender phase (Bouwteam Alpha and a Bouwteam X, not further elaborated). Two observations were from a Bouwteam meeting in the design phase (Beta and one Bouwteam Y, not further elaborated on in this report because interviews were not possible) and one during a Bouwteam meeting in the end of the construction phase (Zeta).

RECAP and interviews

Getting people to agree to be interviewed was also harder than expected. For only five of the nine selected projects the client and contractor could be interviewed. In a few cases it was possible to interview an extra participant of the Bouwteam, like an Antea Group employee or a technical designer. The interviews were all held within an hour and all questions were answered.

Prior to the interviews, the interviewees were asked to fill in the selected parts of the RECAP survey. The interviewees were instructed to score the sub-criteria for the Bouwteam they were working in and for the relationship between the client and the contractor. The interviewees of Bouwteam Delta interpreted this differently and focused on different things while filling in the RECAP survey. The difference between their scores is therefore bigger than when they would both have focused on the client-contractor relationship and on the Bouwteam as a whole. At the end of the interviews, the interviewees were asked if they wanted to add a comment to the filled in questions. Most of the participants were positive about the assessment tool. They could understand the use of it and some added that it could be good to discuss the results with the other party, to improve the understanding of each other and to improve the collaboration.

4.3 Summarized description of Bouwteam Alpha

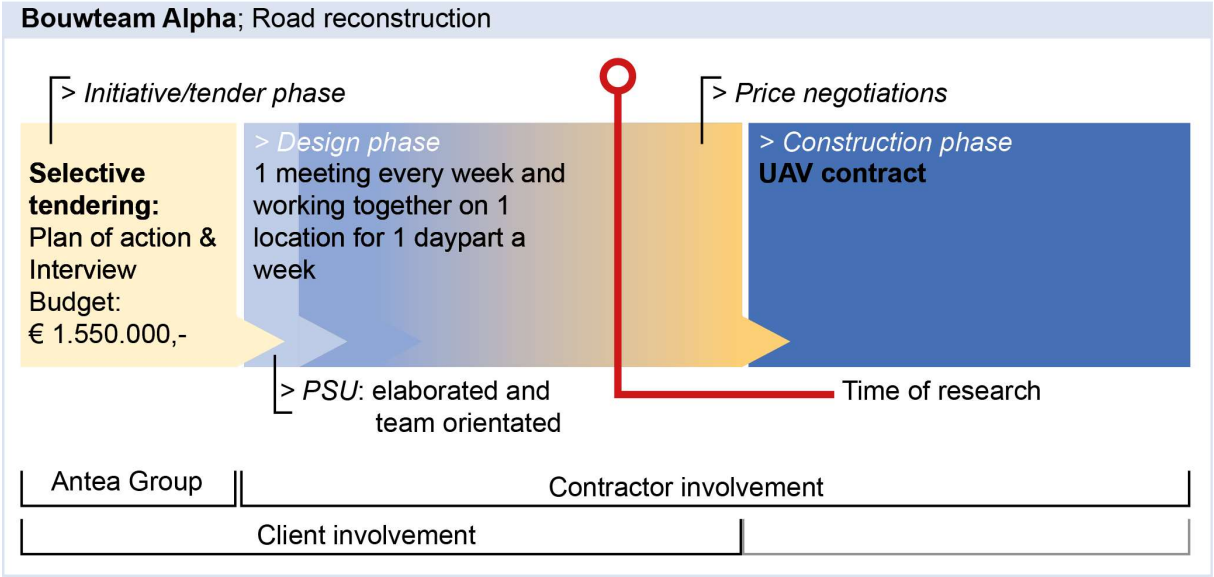

Figure 6; Overview Bouwteam Alpha, own illustration

Summary Bouwteam Alpha
This Bouwteam seems to run well according to the expectations of the client and the contractor. They both indicate to be satisfied about how it is going. Client: '*I am very satisfied with the way this is going*'. The way they describe a Bouwteam and their expectations fit the way they are working together in this Bouwteam. Also, the expected benefits can be seen in this Bouwteam. The client and contractor both think it is very important to work together on the same location and invest time to build up trust and create team spirit. The contractor expected to be able to find more innovative solutions through the collaboration, but thinks this project is just not suitable for a lot of innovative solutions. The contractor has the lead and is doing a good job according to the client. At first the contractor believed the client was not really involved, but this is going better now and the client is giving more input further along in the design phase. The client and contractor agree on most points, especially the importance of the project start-up and the working together part of a day to establish a good collaborative relationship. They both agree that the team fits well together, there is a click between the different participants. According to the client the collaborative relationship is dependent on the kind of people involved. Client: '*You have to have a click and understand each other*'. In general the results of the RECAP matches what was found in the interview. The difference in opinion about the 'no blame' culture is the biggest deviation. The client is very satisfied about this, but the contractor seems to think this could still be better. The biggest difference in scores is found for sub-criteria 12: Coordination. However, the low scores (client) of 2 cannot be explained by the interview, nor by information out the observations or desk study. It would be good to discuss Coordination within this Bouwteam to prevent any miscommunication on this point. ***Obstacles in this Bouwteam*** No big obstacles are found in this Bouwteam. The price negotiations are going well and there is no problem foreseen at this point. Mainly because the first cost estimate of the contractor fitted the cost estimate of the client's well. This nurtured the confidence and trust in each other. Possible obstacles for a Bouwteam, mentioned by the client, occur when a participant would have no time or is passive. An obstacle can also be when the personalities of the participants do not match, or if someone would drop out half way the project. However, this is not the case in this Bouwteam.

The contractor sees a too traditional attitude of a Bouwteam participants as a big obstacle, as well as incomplete information or lack of overview. The contractor is a bit worried about the official separation between the Bouwteam contract and the construction contract, this could lead to struggles in the collaboration.

Success factors in this Bouwteam

As was made clear by the client and the contractor, establishing a collaborative relationship is the biggest success factor for a/this Bouwteam. The collaborative relationship in this Bouwteam is built up by the elaborated PSU, very regular meetings and working together on one location with the whole team. Personalities that fit each other enable trust and team spirit. It is also seen as important that everyone in the Bouwteam has the right mind set and agrees on the non-traditional way of working, which is suitable for a Bouwteam. Being honest, open and work integrated are part of this way of working. Aside from this, the client mentions the following success factors in the interview: timely involvement of stakeholders, clarify scope a.s.a.p., set clear project goals and make sure to formulate expectations and share them with the team.
The contractor adds the following success factors: A good project analysis, a planning with milestones and working in a structured way. Regarding the collaborations he thinks it is very important to have mutual respect and equality between the participants to be able to complement each other and find the best solutions for the project.

4.4 Summarized description of Bouwteam Beta

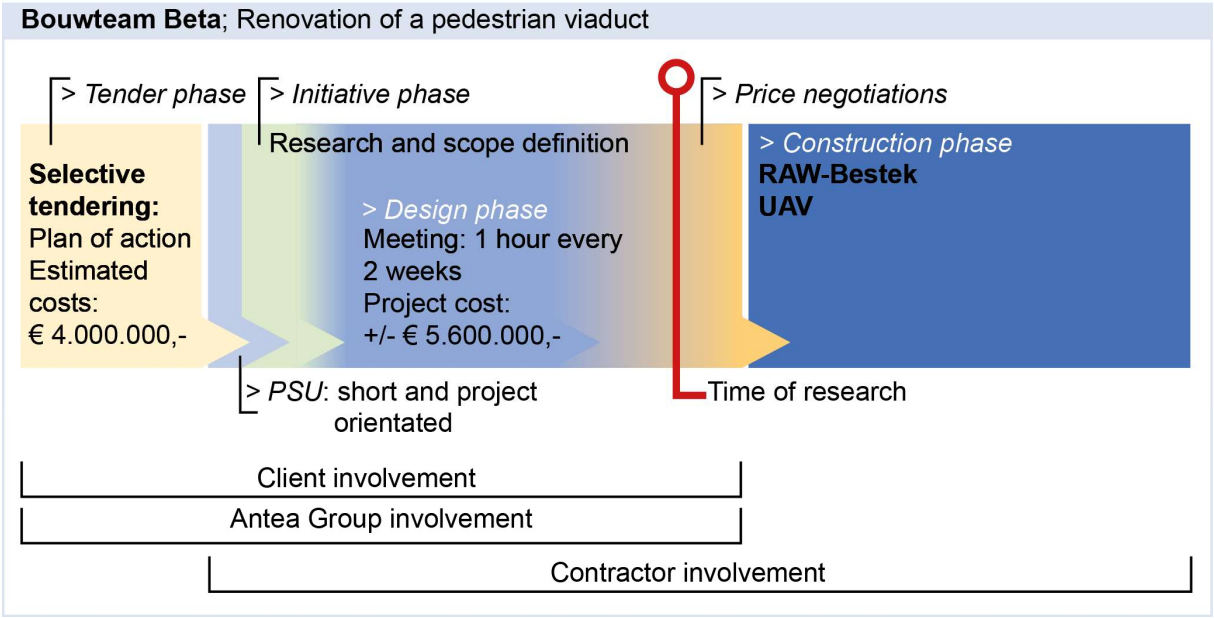

Figure 7; Overview Bouwteam Beta, own illustration

Summary Bouwteam Beta
The Bouwteam participants agree that it was good to choose for a Bouwteam for this project. It gave the opportunity to do the needed research in the field. The research provided insights in the condition of the viaduct to be renovated, and showed that the conditions were worse than was thought before. This knowledge prevented a lot of additional work, extra time and extra costs during the execution. At the time of research, the Bouwteam is finishing the design phase and starting the price negotiations. Little is known about the tendering phase of this Bouwteam. The client asked the potential contractors to submit a Plan of Action for the tender. The contractor says it was not clear from the tender documents that the client wanted a Bouwteam. The Bouwteam started with

a PSU of half a day. The client wanted to start right away and did not see the need for one whole day of getting to know each other, like the contractor had suggested. During the PSU they focused on the project, and used the PSU as an introduction of the project for all participants of the Bouwteam. This Bouwteam has several complexities, the time pressure, political sensitivity and the insufficiency of the budget are the reasons for a difficult project context.

Obstacles in this Bouwteam

Dissatisfaction in this Bouwteam seems to be the result of the little progress, the growing project scope and (in the eyes of the client) the incorrect cost estimate of the contractor. On top of this, different expectations and different opinions on how one should be working in a Bouwteam results in tensions and frustrations between the participants, and are only partly communicated to each other. The client and contractor both indicate to be unsatisfied with the effort and involvement of the other party. The client believes the contractor is only doing the minimal work and does not think out of the box. The contractor thinks the client is not involved enough, nor up to date, and the contractor was expecting to collaborate more with the client. But instead of collaborating, the contractor felt like he is doing all the work. The client and contractor both feel like the other party is not committed to the project. The little time available for and in meetings is not helping the already tensed situation. Even though the contractor asked to meet more often and longer, the client doesn't see the need for more consultation. During the meetings some frustrations are shared with each other, but not everything.

Price seems to become an issue too. The client is not trusting the contractor's prices. Price negotiations will follow soon.

Furthermore, the technical advisor of the client sees distrust, little commitment and lack of integration as obstacles in this Bouwteam. The contractor sees the lack of priority and involvement, and wrong expectations as obstacles for the Bouwteam. The Antea Group advisor sees the insufficient budget, too little time during meetings and the lack of urgency for the project as the areas the Bouwteam has room for improvement. The Antea Group advisor also mentions that the client is acting like they are working in an integrated contract instead of a Bouwteam. The client likes to have the benefits of the Bouwteam, but is not interested in a lot of collaboration with the contractor.

Success factors in this Bouwteam

The biggest success of this Bouwteam is how research was used to discover the current viaduct status. All Bouwteam participants agreed that it was the right way to tackle the uncertainties of this project, which improves the chances of a successful project a lot. The technical advisor is of opinion that the price affects the project, and fair prices, given by the contractor is a success factor. The contractor said in the interview that trust is very important, just as working integrated and spending time together.

Other findings

The Bouwteam is, as the Antea Group advisor said: 'Still alive', but it can be concluded there could be a lot of improvements. It seems the different Bouwteam participants see the project all very differently. And most success factors they mention themselves do not occur in this Bouwteam.

4.5 Summarized description of Bouwteam Gamma

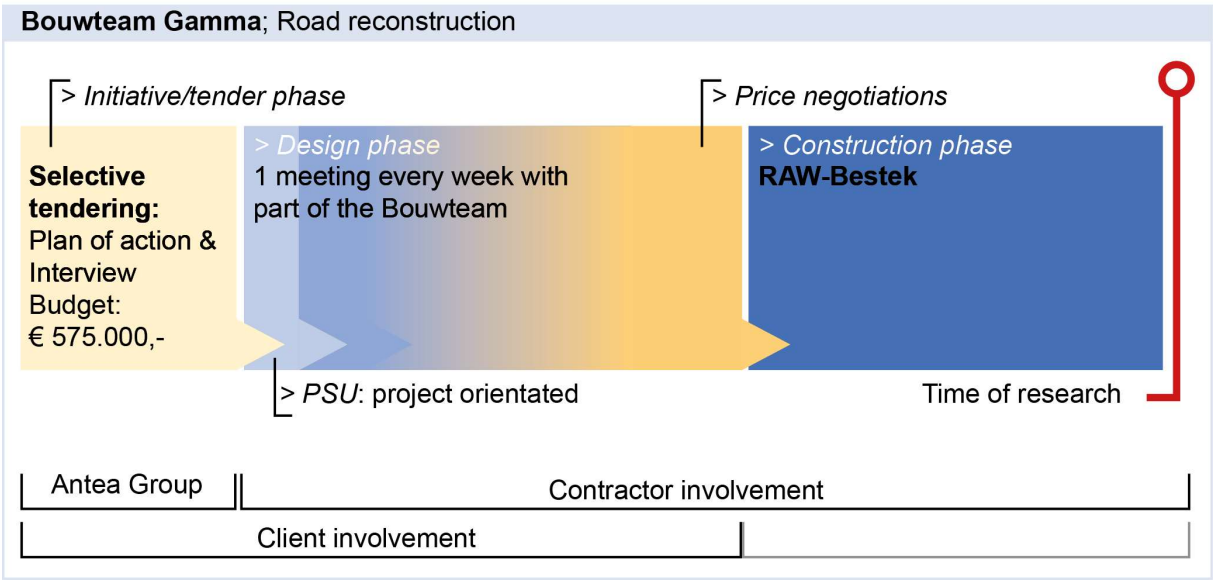

Figure 8; Overview Bouwteam Gamma, own illustration

Summary Bouwteam Gamma
Both parties agreed that this project was not suitable for a Bouwteam. It was simple and had no real complexity. Still both the client and the contractor agree that a Bouwteam is beneficial when the contractor can optimize the design by using his knowledge. They agree that in this case the outcome would not have been that much different if the client would have made the design by themselves. It seemed that the client wanted to keep a lot of influence on the project design. According to the contractor the clients' company has a lot of specialists who were involved in this Bouwteam. These specialists were all very concentrated on their own specialism and kept changing things in the design, without considering what this would mean for the other specialists. Within the Bouwteam, they did not work very integrated. And the different Bouwteam participants of the client company kept changing things even though the Bouwteam had already made a decision on this. The lack of integration and the number of changes resulted in a lot of double work and higher costs. The price negotiations resulted in tension between the client and the contractor. It took a lot of discussion and time before they reached an agreement. The design phase had cost more money than was thought beforehand. In addition, the client found the prices too high, but did not want to tell the contractor where they based their own prices on. The client had been comparing the prices with prices from some years ago, which were not realistic any more according to the contractor. In the end the contractor did not want to go any lower, and the director of the contractor company told the client to take their last offer or find a new contractor. The client took this last offer. After this, the project leader of the client and the project leader of the contractor were both replaced by other people. As can be concluded from the interview and the RECAP survey, this was good for the collaboration in the execution of this Bouwteam. The construction phase went well, without problems and with a good end result, no time loss, and minimal additional works. ***Obstacles in this Bouwteam*** An obstacle was the way the design kept changing, which led to more work and high design costs. The team did not seem integrated and information was not complete when decisions were made. This made it necessary, according to the client, to revoke decisions and go back in the process and change the design. This was not motivating for either parties and led to annoyances and tensions.

There seemed to be a lot of distrust and withholding of information within the Bouwteam, especially regarding the price. The client believed the contractor was asking a too high price for the construction. The client believed the price was too high because there was no competition, and the contractor could have asked more and still gotten the job. The client asked the contractor to give an open price estimation, but didn't want to say where they based their cost estimate on.
The client did not mention clear obstacles when asked, but he indicated that distrust would be difficult for the collaboration. He said that he felt 'healthy distrust' against the contractor. The contractor named some more obstacles during the interview. One of them was not being able to involve all the needed stakeholders in time. Unclear goals, unclear interests, modifications in requirements after the deadline, a fixed project budget, disagreement on price and being too focused on your own tasks were other obstacles seen by the contractor.

Success factors in this Bouwteam
From the interviews the Bouwteam participants made it clear that it is important for a Bouwteam to have some degree of complexity for which it makes sense to involve the contractor in the design phase. The contractor should be able to add value to the Bouwteam, otherwise it makes no sense to work in a Bouwteam.
Trust was one success factor that was named by all interviewees of this Bouwteam. The contractor also added transparency as a success factor. Even though both the client and the contractor agreed trust is very important, it seems that trust and transparency were missing in this project.
Trust, transparency and integration of tasks can be seen as important success factors in a Bouwteam. The lack of integration in Bouwteam Gamma was also indicated through the RECAP survey results. Both parties gave a low score to the sub-criteria 'Team Integration'. The different scores on the statement *project relevant information is shared openly by both teams*, stands out. The client gives a 5 and the contractor a 2. This is certainly a subject which should have been discussed and possibly could have been better.

4.6 Summarized description of Bouwteam Delta

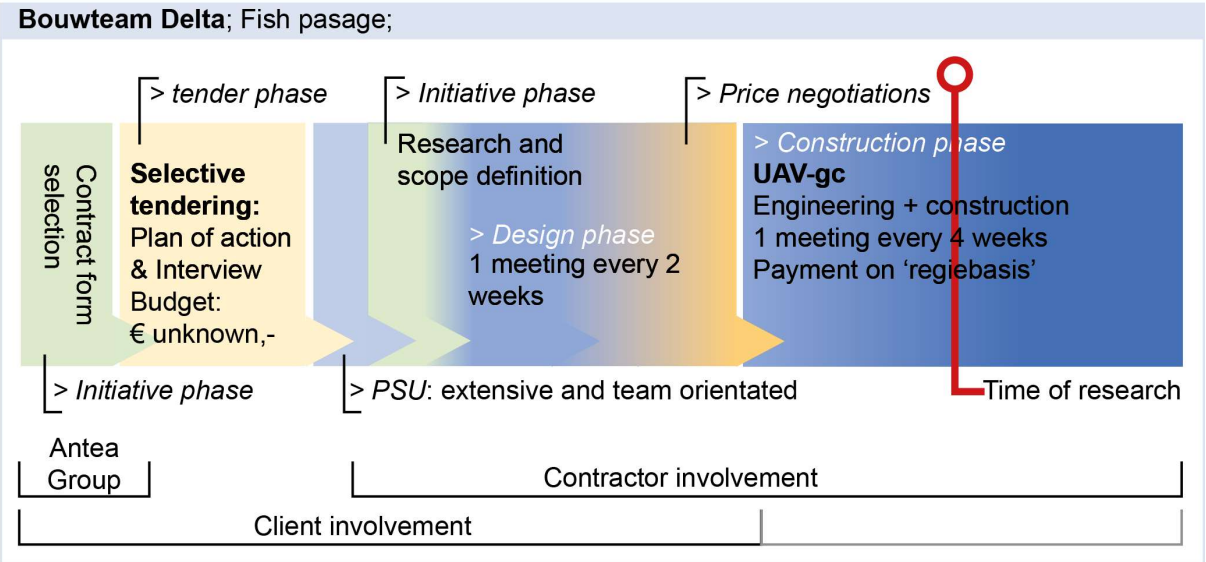

Figure 9; Overview Bouwteam Delta, own illustration

Summary Bouwteam Delta

The Bouwteam is nearing the end of the construction phase and seems to deliver a good result. Both the client and the contractor are satisfied with the construction phase and are able to collaborate in a way that is seen as pleasant by both parties.
The reason to choose a Bouwteam was related to the short time frame available for the project and the undefined scope at the moment of procurement. The benefits of a Bouwteam for this project that were mentioned by the participants were the one time and fast tendering procedure and the possibility to work together to optimize the design and use each other's knowledge to find the best solutions.

Nevertheless, everyone agrees that the design phase did not go very well. The beginning was fine and with a nice PSU and motivated people they started a little too enthusiastically. They did not estimate the cost parallel to the design and ended up with little time left and a design much too expensive. This resulted in a lot of struggles and demotivation. The design had to be reviewed and costs had to be cut. At the end of the design phase they managed to deliver a design fitting the goals and budget, but a lot of frustrations between contractor and the engineering company and between the client and the engineering company was left.
Nonetheless, the contractor and client could agree on a construction agreement and a payment on 'regiebasis'. After the construction contract was signed and the engineering company was no longer involved the project and relationships between the participants stabilized and became more collaborative.

According to the client and the contractor the Bouwteam 'feeling' continues in the construction phase and the collaboration in the construction phase was pleasant.

Obstacles in this Bouwteam

Obstacles in the project were mainly present in the design phase. According to the client and the contractor, the engineering company was not a good fit for this Bouwteam. They were used to a different way of working and were not able to combine this with the way the contractor and the client liked to work. Differences in expectation and dedication to the project created a gap between the client-contractor and engineering company, which made it hard to establish a collaborative setting.
Other obstacles mentioned by the client were a hidden agenda. The contractor also mentioned this, as well as too little time for too much work, different working styles and unfulfilled expectations.

Success factors in this Bouwteam

The PSU was a good start for this Bouwteam and gave the possibility to share personal information and knowledge with each other. Unfortunately, they did not find a way to benefit from this knowledge during the Bouwteam. The client and contractor thought it would be good if someone would have been responsible for the process, relations and teamwork within the Bouwteam.
The client mentioned that success factors for a Bouwteam are to be open and honest, and it should be mentioned when you disagree with something. Another success factor would be to keep each other up to date with the progress of the process.
The contractor mentioned that payment on 'regiebasis' works very well in this Bouwteam. Aside from this, the client and contractor, find it important to keep everyone involved in the project and have regular meetings and short communication lines. He also says it is essential to be transparent about the price.

Other findings

Both client and contractor agreed that the selection criteria to select a contractor for the Bouwteam were not optimal. The contractor thinks the criteria should be more context and project focused instead of being focused on just soft skills.

4.7 Summarized description of Bouwteam Zeta

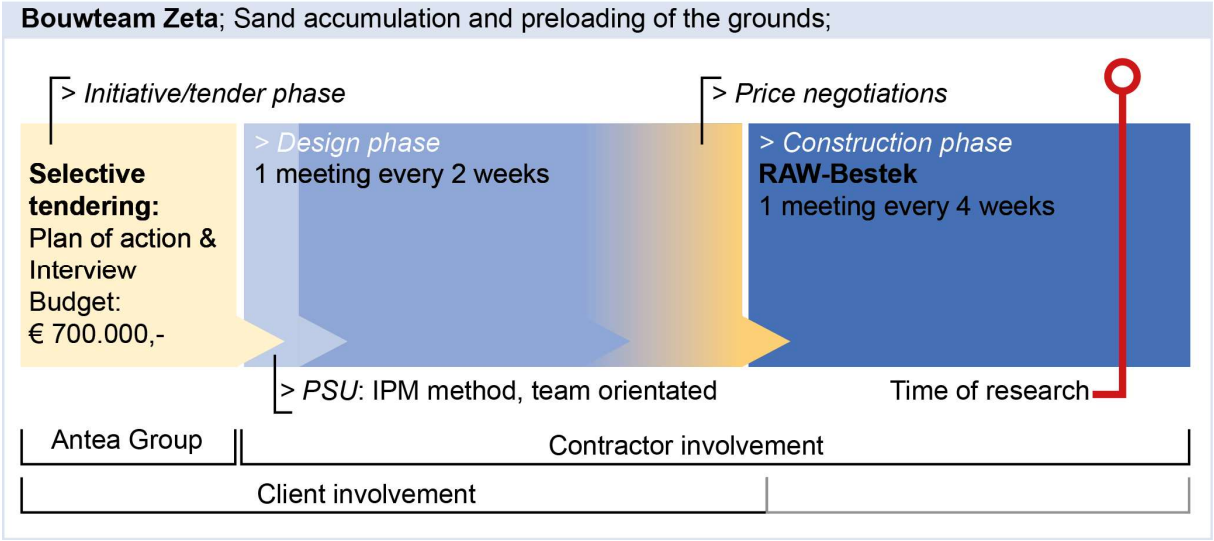

Figure 10; Overview Bouwteam Zeta, own illustration

Summary Bouwteam Zeta
This Bouwteam is almost finished at the time of the research. The contractor and client have been working together for quite some time during the project and have been able to establish a collaborative relationship. The Bouwteam participants are positive about the process of the project and experienced the meetings and collaboration together as pleasant and effective. The total project is almost complete, without problems and with the expected results. The reason to choose a Bouwteam for this project was the time risk and the need for an on-time project completion. The client and contractor were both satisfied about the tendering procedure. For the client this project was the first Bouwteam he worked in. The contractor had a lot more experience in Bouwteams. Trust needed to be built up over time and could grow during the meetings. In the beginning the client was afraid a Bouwteam would lead to higher price, but along the way discussions and trust led to a balanced price which made both parties happy. The RECAP survey outcome (little difference between the scores of the client and contractor) matches the image of the project that has been created through desk study, observation and interviews. Both the client and the contractor experienced the project very positively and had equal expectations and opinions about how the project proceeded. This could also be seen in the meeting during the observation. ***Obstacles in this Bouwteam*** No big obstacles have been found in the process of this Bouwteam. The client mentioned that during the price negotiations the contractor gave some incorrect quantities which increased the price. The client decided to redo the calculations themselves to check the accuracy. The price was indeed too high and this resulted in some distrust for some period of time. After some time the contractor regained the trust of the client, leaving no big consequences for the collaboration or the project. The client therefore mentioned ‘money’ as an obstacle in a Bouwteam. The contractor mentioned that it could be an obstacle if the client has no experience in Bouwteams, but this didn’t lead to problems in this Bouwteam. Time pressure resulted in a fast start in which the contractor tried to do a lot of tasks fast and on their own, more than the client wanted. The client made it clear that they wanted to be more involved.

Success factors in the Bouwteam
Success factors given by the client are: sharing information and being involved in each other's decision making, as well as being open and honest and making sure to write down the agreements between the parties.
The contractor agrees with those success factors and adds that regular meetings is very important for the collaborative relationship and communication. He also mentioned that friction should be discussed immediately. This was done when they did not agree on the quantities and price of the project. Through discussion it was possible to find a solution for both parties.
Another successful element that has been applied in this Bouwteam is the 'evaluation point' at the end of the agenda of each meeting. This gave both parties the opportunity to discuss the thing that went well and did not good well and find a solution together.

4.8 Closing remark single cases

Through analysing the individual case studies it was possible to find out how the Bouwteams function. The most satisfied participants were those in Bouwteam Alpha and Zeta. Both the clients and the contractors were very positive about how the Bouwteam progressed. The close collaborative relationship established within these Bouwteam made it possible to find the best solutions and make quick decisions at crucial moments. The almost completed Bouwteam Zeta had achieved its goals within the budget limit and with minor time overrun. Bouwteam Alpha is not yet as close the end of the project, but according to both the client and the contractor, they are experiencing a good team spirit, and both think they will bring this Bouwteam to a good end.

Bouwteam Beta is nearing the end of the Design phase, and price negotiations are about to start at the moment of this research. The difficult project environment of political pressure, enlarged scope, and costs make Beta a complex project. Even though the contractor suggested to meet more often and invest more time into a collaborative relationship, the client was not interested. The fact that the client and contractor are not on the same line also shows in the RECAP results. Both the client and contractor expressed their frustration about each other during the interviews, but didn't inform each other about those frustrations. They are missing an integrated collaboration and are unaware of the expectations of the other party. In addition, the client is not open to the Bouwteam-way-of-working despite selecting this contract form.

Bouwteam Gamma was finished at the time of research which gave the opportunity to analyse the complete Bouwteam process. During the interviews with the client and the contractor, it became clear that difficulties started during the design phase. The client kept adding requirements and changes to the design, and expected the contractor to implement the adjustments in the design time after time. When requesting the adjustments, the client did not care for the consequences this had for other parts of the design or on the decisions that were already made, providing the contractor with a lot of rework. The client and contractor had different opinions about the execution methods and about material prices. The price estimations started late and the client thought the price was too high. Lengthy price negotiations followed which were unpleasant for both parties. When they finally reached an agreement, the deadline was long gone. Both the client and contractor decided to change the project managers of their party, which incidentally led to a more pleasant and smooth execution of the remainder of the project.

In Bouwteam Delta the participants started enthusiastically with an elaborated PSU. The collaboration went well until the design was almost finished and the price estimation indicated that the design was too expensive. Extra time was needed for redesign and to find optimizations to make the design cheaper. Time was running out and the client didn't feel like the engineering company made a lot of effort to find a better solution. Frustrations and

distrust damaged the collaboration. In the end the client, the contractor and the engineering company managed to come to a design that met the requirements, and the job of the engineering company was done. The absence of the engineering company and the signing of the construction contract gave a lot of peace within the Bouwteam. The client and contractor were able to regain their trust and work smoothly together in the construction phase, focussing on the best technical solutions instead of the price.

From examining the Bouwteams in practice it has become clear that the processes within a Bouwteam are not always the same. It has also shown the extent to which the benefits of a Bouwteam are reached can differ greatly from each other. The benefits of a Bouwteam, as stated in different literature sources, are also seen as benefits by the interviewees. The reasons for the client to choose a Bouwteam is often strongly related to these benefits. However, the Bouwteams do not always deliver the expected benefits or meet the expectations which were often the reason to choose for a Bouwteam in the first place. Three of the five Bouwteam cases showed opportunities for improvements. These three partly face similar obstacles, but also project specific obstacles.

Difference between theory and practice:
- In the analysed cases, there wasn't always a third party involved as the literature suggests. And if a third party is involved, then this advising participant almost always participated as a member of the client or contractors company, because they were hired by the client or the contractor to supplement one of their teams. - Another difference is the way the literature discusses the price negotiations phase of Bouwteams. The negotiation phase is discussed as a separate phase, following on the design phase. In practice, the price negotiations (phase) are more a part of the design phase as the price negotiations mostly run parallel to the development of the design. - Literature suggests that the client has more often the leading part in comparison to the contractor, based on the Bouwteam contract model of 1992. But in practice, the contractor was mostly in the lead. This makes the contractor more involved and changes the dynamics with in the Bouwteam.

4.9 Justification of the ten subjects chosen for the cross case analysis

Up till now the sections in this chapter presented all the individual Bouwteam cases studied. Based on this analysis, the literature study, and the insights gained from these by the researcher, ten subjects are chosen for further examination in a cross case analysis in chapter 5. The subjects are: 1) Reasons for a Bouwteam, 2) procurement criteria, 3) price element, 4) project start-up, 5) tasks distribution and expectations, 6) collaboration, 7) decision making, 8) openness and honesty, 9) price negotiations and 10) the construction. These subjects are selected for a number of different reasons. Before continuing to the next chapter where these subjects are examined further, a justification of why these subjects are chosen is given in this section.

Tender phase

1. Reasons for a Bouwteam

The clients of Bouwteam Beta and Gamma did not choose a Bouwteam for the right reasons. Beta's client wanted to minimize the risks but was not interested in collaboration. For Gamma, the client wanted to gain experience in Bouwteam but the project itself was not really suitable to benefit from working in a Bouwteam. The reasons why the client chooses a

Bouwteam always comes with a certain attitude and motivation. The right, or wrong, attitude and motivation can have a considerable influence on the functioning of a Bouwteam. A comparison through cross case analysis on this subject must show what is done, or can be done, to make sure a Bouwteam is chosen for the right reasons. This could allow for an early assessment of the chances of success of a Bouwteam, and whether a Bouwteam should be used at all.

2. Procurement criteria

In literature, no standard selection criteria are available for a Bouwteam, but in practice it is common to procure a Bouwteam on (at least partly) quality instead of price. The criteria to select a contractor are often focused on 'collaboration' and other soft skills of the contractor. This is confirmed in literature, found through desk studies and seen during the observation at selection meetings. Setting the right selection criteria to select the right contractor is difficult, and hard to assess objectively. The wrong criteria can lead to discussion and even to the selection of a less suitable contractor. Through the cross case analysis it is studied what criteria are used and how these can be optimized.

3. Price element

When selecting a contractor, the client likes to have some control over the price of the project, because once the contractor is selected, there will be little competition (Boijens, 2008; Lagemaat, 2015). In literature, different methods are used to include a price element to select a contractor (Chao-Duivis, 2012). These different methods are also seen in practice. Literature and practice agree that a Bouwteam should not be procured 100% on the lowest prices, but always (partly) on quality. If the focus of the procurement criteria are too focused on price, it can have a negative effect on the collaboration (Lagemaat, 2015). Despite the literature study and the case studies, the best way to include a price element still remains unclear. Therefore this subject will be further analysed during the cross case, comparing the ways of including price and the results this has within the Bouwteam cases.

Design phase

4. Project Start-Up (PSU)

Literature about Bouwteams does not mention PSU, but a PSU is almost always used in practice at the start of a Bouwteam. PSU's are applied differently. Literature does state that it is important to establish a good collaboration between the Bouwteam in the beginning of the design phase (Koning, 2001). In some cases studied a PSU is used to start the collaboration and the participants find the PSU of high importance, but others see a PSU as a waste of time. Analysing the effects of PSU across all cases studied should hopefully make the role of a PSU in Bouwteam clearer.

5. Tasks distribution and expectations

A frequently discussed subject in literature is the importance of paying attention to the division of the responsibilities and tasks distribution. Different studies advise to clearly describe the division of tasks within a Bouwteam to prevent discussions or unfulfilled expectations (Boijens, 2008; Chao-Duivis, 2012; Koning, 2001; Lagemaat, 2015). This is also a much discussed topic in practice, especially because it is no longer evident that the client is always in the lead. The case studies indicate that is it not always clear what the client expects from the contractor and vice versa. Some case have less trouble with expectations (about tasks) than others. What can be learned about task distribution and expectations when comparing these cases?

6. Collaborating needs more than the contract

Form literature it can be concluded that collaboration between the client and the contractor is very important in any collaborative agreement (Suprapto, 2016). There are many studies explaining how to establish a good collaborative relationship, but they also show that

realisation in practice is difficult (Kamminga, 2011; Lagemaat, 2015; Suprapto, 2016). In the case studies it is seen that the effort that is put into collaboration within a Bouwteam can differ a lot per Bouwteam, just as the result of these efforts differ. ‘What is a good way to invest in collaboration within a Bouwteam?’ is further studied in the cross-case analysis.

7. Decision making

The traceability of decision making is important within a Bouwteam (Boijens, 2008; Chao-Duivis, 2012). In practice this is also applied and this prevents unnecessary discussions. In the study of Boijens it is concluded that the design phase can stagnate when decisions are postponed or revoked like in Bouwteam Gamma. It seems that decisions cannot be properly made for a number of different reasons. Yet other Bouwteams don’t have this problem. What can be learned about preventing stagnation of the design phase from comparing these cases?

8. Openness and honesty

To come to a good collaborative relationship, it is important to build up trust by being open and honest (Suprapto, 2016; ten Hoeve, 2018). However, being open and honest can make one vulnerable. It is very important to stimulate this kind behaviour, but is difficult to reach this in practice because it asks for cooperation from every member. Through the cross case analysis it is studied what works best to stimulate this kind of attitude with every participant.

Price negotiation phase

9. Price negotiations

Literature often talks about a separated price negotiation phase, especially when the 1992 Bouwteam contract model is used (Chao-Duivis, 2012; Koning, 2001). Practice shows the price negotiations as a part of the design phase in some cases, while in other Bouwteams they still hold on to the price negotiations as a separate phase which starts at the end to the design phase, when the design is completed. This difference between literature and practice and the tension witnessed around the price negotiations in the Bouwteam cases, gives reasons to further investigate this subject in the cross case analysis.

Construction phase

10. The construction

It is not standard any more to execute the project in a traditional way using a UAV (De Koning, 2018). The cases show that the collaboration between client and contractor can be continued in the construction phase. It differs per project what way of involvement fits best. From the cases it shows that the construction can be executed to satisfaction of both parties.

5 | Cross case analysis

The goal of this chapter is to find general obstacles and recommendations that hold for a Bouwteam's functioning, thus completing an answer to sub-question 3 and initiating an answer to sub-question 4. In this chapter the cross case analysis is carried out, based on the results of the five case studies, through which aspects, which are of general value to any Bouwteam, can be identified.
In Appendix E the complete collection of raw data of each of the Bouwteam cases is presented. This data is analysed systematically, going through all the Bouwteam phases (tender phase, design phase, price negotiation phase and construction phase), and evaluating whether there is a subject that is worth analysing further in relation to the optimisation of a Bouwteam. This resulted in a list of ten subjects (elaborated on in section 4.9) extending over all four Bouwteam phases, which formed the focus of the cross case analysis. The selected subjects are displayed in table 2 per phase.

Table 2; The ten subjects on which the cross case analysis is focussed

Phases	The 10 subjects	Subject discussed?		
		5.1	5.2	5.3
Tender phase	1. Reasons for a Bouwteam	NO	NO	YES
	2. Procurement criteria	YES	NO	YES
	3. Price element	YES	NO	YES
Design phase	4. Project Start-Up (PSU)	YES	NO	YES
	5. Tasks distribution and expectations	YES	NO	YES
	6. Investing in collaborating	NO	YES	YES
	7. Decision making	NO	NO	YES
	8. Openness and honesty	NO	YES	YES
Price negotiation phase	9. Price negotiations	YES	NO	YES
Construction phase	10. The construction	YES	NO	YES

A cross case analysis is carried out for each of the different data sources. Table 2 shows in which data source (5.1 desk study, 5.2 observation and 5.3 interviews) information was found about which one of the ten subjects. Not all subjects are discussed under all sections because the data of a specific source did not always include information about all ten subjects. In section 5.4. the RECAP survey results are compared and discussed but are not further related to the ten subjects of table 2. In section 5.5, all cross case results of the different data sources are combined in one cross case summary for all ten subjects. In this summary the obstacles found in the Bouwteam cases are displayed and recommendations are given based on the obstacles collected during the case studies.

5.1 Cross case analysis desk study

In figure 11 an overview, based on data from the desk study, of all five Bouwteam cases can be seen. The information of each of the Bouwteams is displayed in a similar way to expose differences and similarities between the Bouwteams.

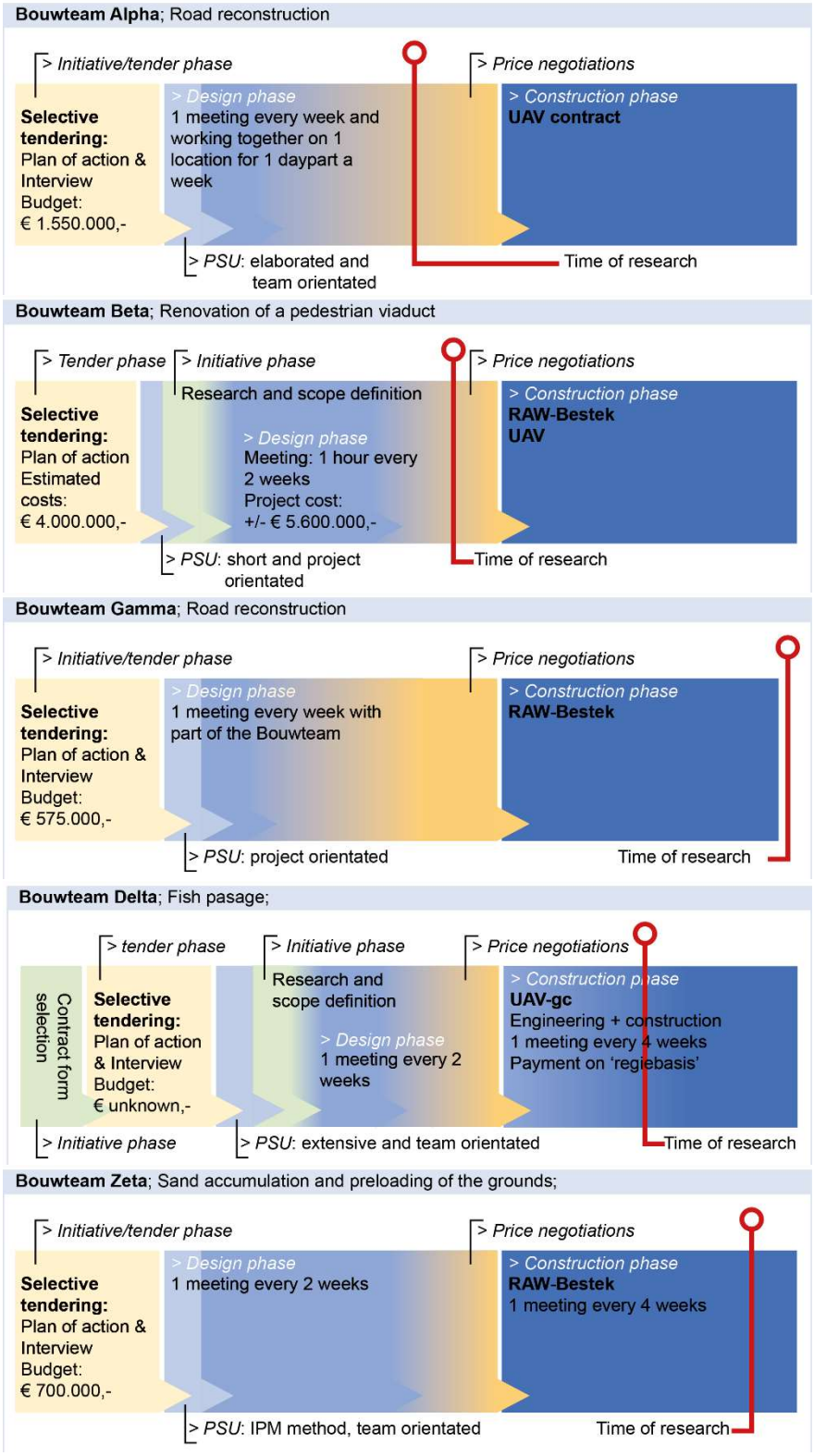

Figure 11; Overview image data desk study all Bouwteams, own illustration

2. Procurement criteria

All Bouwteams have been procured through a selective tendering, of which two were procured within a framework agreement. In four Bouwteams (Alpha, Gamma, Delta and Zeta), the potential contractors were asked to give a presentation about the risks of the project, and to do an interview with the contractor's contact person ('sleutelfunctionaris') within the Bouwteam. For Bouwteam Beta, the potential contractors were asked to hand in a document with the Plan of Action and a risk-assessment, but no presentation or interview was conducted. In all Bouwteams, except Bouwteam Delta, Antea Group was involved to organise and execute the tender phase.

3. Price element

Gamma and Zeta used a maximum project budget as a selection criteria. The contractors were only allowed to participate in the tender if their cost estimate for the job was beneath this fixed budget. For the contractor to get the construction job after the design phase, the contractor had to bid a price below the fixed budget, otherwise the client would be allowed to look for another contractor.
The client of Bouwteam Alpha, Beta and Delta only gave an estimated budget for which the job should be done. This was not a fixed budget, but a directive to give the contractor an idea of the size of the project. For Bouwteams Beta and Delta the contractor was involved before the scope was completely defined, which made it harder for the client to make a cost estimate prior to the tender phase. Thus, the contractors were already involved when defining the scope for the Bouwteam.

4. Project Start-Up (PSU)

The project start-ups of the different Bouwteams varied from short and mostly project focused through elaborated and mostly process and people focused. Alpha, Delta and Zeta used the PSU to get to know each other and to start building up a collaborative relationship.

5. Tasks distribution and expectations

In all five Bouwteams the contractor had been given the lead of the project. Only in Bouwteam Beta, a third party (Antea Group), appointed by the client, and was leading the meetings. Still, the contractor was officially in the lead of this project too.
In all Bouwteams the client was more involved in the design phase compared to the construction phase. This is not surprising since this follows from the Bouwteam contract. In three of the five Bouwteams (Alpha, Gamma and Zeta), the contractor is involved at the beginning of the design phase. For the other two Bouwteams, Beta and Delta, the contractor was already involved in the initiative phase, to help to define the scope.

9. Price negotiations

Compared to the other Bouwteams, Gamma had a long price negotiation phase in comparison to the planned price negotiation phase. From the interview later on it became clear that they indeed had difficulties coming to a price.
The price negotiations of Alpha started already in the beginning of the design phase, when the contractor made his first cost estimate. In the Bouwteams Delta and Gamma, the first shared cost estimate of the contactor was given at the end of the design phase.

10. The construction

Only in Bouwteam Delta an UAV-gc contract was used for the construction phase. In all other Bouwteams, an UAV with RAW-bestek was used. For Delta an UAV-gc was used, because the design of Delta was not completed at the time the construction contract was signed. The design still needs optimization and engineering, which will be done by the contractor instead of the engineering company who was involved in the design phase.
Another noteworthy observation is that Bouwteam Delta used payment on 'regiebasis' in the construction phase. In the interviews, both contractor and client are satisfied with this way of

payment and agree that it is an open and fair method. In all the other Bouwteams the client and contractor agreed on one fixed price for the construction phase (subject 9. & 10.).
In all Bouwteams the construction phase was executed without serious problems and with little additional work or time overrun.

5.2 Cross case analysis observations

The different observations at Bouwteam meetings are analysed and compared here.

2. Procurement criteria

The two selection meetings of Bouwteam Alpha and X (as introduced in 4.2) are very comparable in process and setting. Both tendering procedures were organized by Antea Group. In both cases the tender assessing committee consisted of one chair and two assessors from the client's company, and one assessor from Antea Group. The assessment was based on a presentation and an interview with the contractor's contact person ('sleutelfunctionaris'). During both assessments, the Antea Group participant had to explain several times how to assess the presentations and interviews. With the exception of the Antea Group member, neither the assessors, nor the chair, had any experience with Bouwteams or a Bouwteam tendering procedure. The criteria set to assess the tender were interpreted in different ways by the assessors, and in both cases the Antea Group member had to steer the committees in the right direction, even though this is the job of the chair. One of the potential contractors of Bouwteam X gave the impression that they would make use of sub-contractors for almost all activities. Some of the assessors did not like this because they were afraid that they would have less control over the execution of the project. The assessors wanted to give this potential contractor a lower score based on the notion that this contractor would outsource the works. However, this is not allowed by the Antea Group member, because 1) it was an assumption and 2) it wasn't one of the selection criteria. In the end this contractor won the tender, but it was not the contractor preferred by the majority of the assessors.

The selected contractor for Bouwteam Alpha had, amongst others, won because he had been very open and honest about the project budget. He showed his cost estimate and revealed he would not be able to make the project for the provided budget, but he had already come up with solutions for cost and design optimisation (subject 8.). This was greatly appreciated by the client.

6. Collaborating needs more than the contract
8. Openness and honesty

Two observations were done at meetings during the Bouwteam design phase (Bouwteam Beta and Y). One meeting of Bouwteam Zeta was observed during the construction phase. These three meetings are not comparable with the selection meetings of Alpha and X because for the former the Bouwteam team was already complete. The biggest difference between the Beta and Zeta meetings was the chair. For the Beta meeting an Antea Group Bouwteam participant led the meeting. For the Zeta meeting this was the contractor. The observation at Bouwteam Beta showed that a lot of the frustration was not shared during the meeting. This was useful for the Bouwteam description to be able to understand why the scores of the RECAP survey were fare apart.
It was observed that during the meeting of Bouwteam Zeta there was a very friendly setting and the participants helped each other to understand the progress of the project. Without a lot of discussion, additional work was discussed and divided between the client and the contractor. At the end of the meeting they had a standard evaluation point on the agenda in which both parties shared what they thought went well and what needed improvement. After the meeting, the contractor showed the participants around on the construction grounds.

When the two meetings of Beta and Zeta are compared, it is seen that the participants of Bouwteam Zeta have a more collaborative relationship. They are willing to help each other and show dedication to the project. In addition, from the RECAP survey it shows the client and contractor of Zeta are more on the same line than the participants of Beta (see table 3).

During the meeting of Bouwteam Y, the participants had difficulty making decisions because the right person to make the decisions was not present at the meetings. The meeting was inefficient because the authorised decision maker of the client's company had to be called several times during the meeting to make the decision. Even though eight other participants were present, the one who had the information about the subjects being discussed was not available and decisions had to be postponed.

5.3 Cross case analysis interviews

The answers to the interview questions are laid side by side to create an overview of all the answers given by the interviewees. Similarities or striking differences in the answers are placed under corresponding subject, and listed below, in the same order as in table 2.

1. Reasons for a Bouwteam

Almost none of the interviewees had previous experience in participating in a Bouwteam. Inexperience of the participants often came with the wrong expectations about a Bouwteam, or the wrong reasons to choose for a Bouwteam. These expectations had to be set right in the beginning by discussing each other's expectations. When this doesn't happen it can easily lead to misunderstandings and frustrations. Three Bouwteams did take the time to make sure the participants all had the same expectations about the way of working in a Bouwteam (subject 1. & 4.). Several participants indicated that the difference in expectations or wrong expectations are indeed an obstacle for a well-functioning Bouwteam.

The interviewees gave several reasons for choosing a Bouwteam. A certain project complexity and time pressure were the major reasons. The other reasons named by the interviewees were: complexity of the execution (Alpha), an undefined scope, unclear risks, bad experience with the traditional procurement, time pressure, political complexity (Beta), to gain experience in Bouwteams (Gamma), undefined scope, time pressure (Delta) and the possibility to collaborate more and book better results (Zeta client). The reasons for choosing a Bouwteam corresponded with what the interviewees stated as the benefits of using a Bouwteam.

Benefits of a Bouwteam:

- Collaboration. Being able to sit around the table together and make a good design in collaboration with the contractor (Alpha).
- The possibility to investigate the scope and the project site together and make the design with the help of the contractors' expertise, before setting a price and the construction agreements (Beta client, Beta Antea group participant).
- The opportunity to make the design in consultation with the client, make a better risk estimation and book better results. Also no procurement on lowest price (Beta contractor).
- The ability to use the expertise of the contractor during the design phase (Gamma client).
- Only one tender is needed for the design phase and the construction phase. Also working together to find optimal solutions for the project (Delta client).
- A smooth and fast process, and only one tender (Zeta).
- The design will be constructable because the contractor is involved by making the design. High involvement of all participants makes it possible to make quick decisions if something changes and the price is set through negotiations which gives a fair price (Zeta contractor).

From the interviews it can be concluded that Alpha and Zeta were able to reach the benefits they associated with a Bouwteam (up till now). The project and collaboration was running according to the expectations and both the client and contractor of Alpha and Zeta were satisfied about the Bouwteam.
Bouwteam Beta, Gamma and Delta did not reach the benefits which they hoped for:

- For Bouwteam Beta, according to the contractor and the Antea Group participant, the benefits of a Bouwteam were not reached. The collaboration and integration was lower than expected and made it feel like they were not working together as a team.
- For Bouwteam Gamma, both the client and the contractor concluded that the client would have been able to make this design on its own, whilst a Bouwteam was chosen to be able to make a more optimal design by using the expertise of the contractor.
- For Bouwteam Delta, the client and contractor had expected to be working together more easily without all the frustrations and rework. Instead of focussing on the best solutions, as they expected within a Bouwteam, they were debating about the costs.

2. Procurement criteria

The client and contractor of Alpha and Zeta were very positive about the tendering procedure, and would like to do more tenders in this way. The procurement criteria focused on collaboration and openness, and provided a good starting point to continue this collaborative attitude during the Bouwteam. The participants of Bouwteam Beta and Delta were less positive about the tendering procedure and criteria. From the interviews it became clear that the procurement criteria of Delta did not give the client the ability to make a clear distinction between the submitted tenders of the different contractors. The contractor had a similar problem, and didn't feel he was able to make himself stand out from the other contractors through this way of tendering. Both the clients and contractors, thought the criteria to assess the tenders were too process focused.
The contractor of Bouwteam Beta indicated that they had difficulties with understanding what the client wanted from the provided tender documents. They expected the client wanted to collaborate a lot, but during the project it became clear that the opposite was true.

3. Price element

During the interviews it became clear that the opinions of the interviewees widely differed on this subject. Some think there should not be a price element at all with the tendering, whilst others think it is best to procure the job at least for 50% based on lowest price. One of the participants of Bouwteam Beta recommended to fix at least some of the price, instead of fixing nothing prior to the procurement, as was done in Bouwteam Beta. He suggested to, for example, fix material prices or service prices to keep more control over the end price. The participants of Bouwteam Gamma did not think a maximum project budget is a good way to keep control over the end price. The participants of Bouwteam Gamma experienced a difficult price negotiation phase and therefore suggested to make the price a part of the tender criteria, or add it as a 'guideline', but not fix a maximum project budget.

4. Project Start-Up (PSU)
6. Collaborating needs more than the contract
8. Openness and honesty

In Bouwteams Alpha, Delta and Zeta an elaborative PSU was carried out, focusing on the process, people and team. The participants of these Bouwteams indicated that an elaborative PSU is very valuable for the team integration and collaborative relationship. Though a PSU is a good start, Bouwteam Zeta shows that more is needed than just a PSU to maintain a good integration and collaboration. It is essential to think about how to use the gained knowledge from the PSU during the Bouwteam. A good option for maintaining a collaborative relationship could be to meet regularly or even work together at one location, as was done in Bouwteam Alpha. The participants of Bouwteam Alpha indicated they have a good integrated team with nice people and according to the client: 'good team spirit'.

In Bouwteam Beta the client was less convinced that a PSU is valuable for the project. The client wanted a short and project focused PSU and did not think meeting more regularly would make the Bouwteam function better. Bouwteam Beta meets one hour, every two weeks. The contractor indicates that the team is not very integrated, that the collaboration could be better, and that a one hour meeting is too little to establish trust and a good collaborative relationship. From the interviews of the participants of Bouwteam Beta it shows that there are several frustrations and misunderstandings between the participants. In the meetings it seemed that only a few of these frustrations are discussed (section 5.2 Cross case analysis observations). This also shows in the RECAP results (section 5.4 Cross case analysis RECAP survey), in which the difference in scores between the client and contractor are very high for Bouwteam Beta.

5. Tasks distribution and expectations

On multiple occasions contractors indicated that the agreements made were not always clear. Especially agreements about tasks and what the client expected from the contractor. In several Bouwteams there was misunderstanding about the compensation for the design phase and about what it exactly meant to work in collaboration with each other.
Even though the contractors were given the lead in the Bouwteams, the clients were still the ones responsible for the final decisions and for the final project.
In Bouwteam Beta, the Antea Group participant, hired by the client, was chair of the Bouwteam meetings, but the contractor was still in charge of the whole Bouwteam. The interview with the Antea Group participant shows that he is not sure what his added value is for this Bouwteam. He tries to make himself useful and help the client as best as he can by controlling the details and help with the financial part. A clear task description and shared expectations upfront (even before the start of the tender) could have led to more mutual understanding and a common goal to work towards for the Bouwteam participants.

In Bouwteam Beta and Delta different participants also indicated that the expectations about the amount of effort put into the project differed between the participants which resulted in frustrations.

8. Openness and honesty

Openness, honesty and trust are seen as important success factors of a Bouwteam by almost all interviewees. Openness and honesty are related to getting to know each other, sharing expectations about task and collaboration, and the ability to meet agreements or deadlines. It also relates to letting each other know when one thinks differently or disagrees with the other participants. Openness and honesty about these topics will improve the trust among the participants and result in a better collaboration. According to several interviewees, a better collaborative relationship will, much like a virtuous circle, give more room for openness and honesty. Most of the interviewees agree that by spending time together one is able to build up trust and stimulate collaboration.

7. Decision making

9. Price negotiations

The price negotiations of Bouwteam Alpha and Beta were not yet finished at the time of the research. Alpha started the price negotiations early in the design phase and compared the cost estimate of the client to the first cost estimate of the contractor. The cost estimates did not differ a lot and both were satisfied about the cost estimate of the contractor. In Bouwteam Beta, the first total cost estimate was given, but still needed to be discussed by the client and contractor. The client indicated during the interview that he did not agree with the cost estimate and foresaw some problems regarding the cost for the sub-contractors which had already been discussed several times, without results. The price negotiation of Bouwteam Zeta took place without too much difficulties. For Bouwteam Zeta, a requirement for getting the construction job is to keep the price within a fixed budget, and this succeeded.

The price negotiation of Gamma and Delta were difficult for similar reasons. In both Bouwteams the first cost estimate was provided late in the design phase. In Gamma the client kept changing the requirements for the design which increased the cost of the design phase. They also had a miscommunication about the payment for the design phase. In Delta, the design turned out to be too expensive at the moment the design was almost finished. Changing the design and finding cheaper options cost more time and therefore more money than expected. It was unclear who had to pay for this which made the price negotiations unpleasant and tiring for all participants.

10. The construction

Bouwteam Gamma, Delta and Zeta were halfway or finished with the construction phase at the time of this research. They were all very satisfied about how the construction phase was going. The Bouwteams encountered only little additional work and little to no time overrun. Even though not all benefits of the Bouwteam were achieved in all cases, for most participants it seemed that the construction of the project functioned better than 'traditional' projects.

5.4 Cross case analysis RECAP results

Previously, in chapter 4, the results of the RECAP surveys taken within one Bouwteam were compared to each other to expose the differences between the client and contractor in that project. These differences give an indication of where the client and contractor disagree about the collaboration and where optimisation is possible (Suprapto, 2016). In this section (5.4) these differences are compared to each other. I.e. the points on which the client and contractor from Bouwteam Alpha disagree on, are compared to the points of disagreement from Bouwteam Beta, Gamma, etc. The results of this cross case comparison can be found in table 3. Big differences (1.0 point or more) indicate room for improvement on this collaboration factor.

Scoring the RECAP

Under each of the sub-criteria from Suprato's (2016) study there are several statements to score. The complete RECAP surveys with its statements can be found in Appendix D. The scores can range from 1 (strongly disagree) to 5 (strongly agree). The statements are filled in by the client and contractor separately. The difference in their scores is averaged over the statements under the corresponding sub-criteria. This average difference in each sub-criteria is the value recorded in table 3 under the respective Bouwteams. The average score per sub-criteria of all the case studies are given at the right hand side of table 3.

*An important note is that the score gaps do not show the differences between the client and the contractor in achieving the degree of collaboration individually, but should be interpreted as 'the perceived differences of similar phenomena' (Suprapto, 2016, p195).

Table 3: Comparison RECAP results of all interviewees, biggest differences between client and contractor highlighted in red

Criteria	Sub-criteria	Alpha	Beta	Gamma	Delta	Zeta	average
Front-end definition	1. Front-end definition	0.1	0.8	0.9	0.4	0.2	0.48
Collaborative practices	2.Team integration	0.5	2.0	1.7	1.0	0.2	1.08
	3. Joint working processes	0.3	1.5	0.5	0.5	0.5	0.66
Project performance	4. Efficiency	0.5	1.5	1.0	2.0	0.0	1.0
	5. Quality	1.0	1.0	0.5	2.0	0.5	1.0
	6. Satisfaction	0.0	0.0	1.0	2.0	0.0	0.6
Relationship continuity	7. Relationship continuity	1.0	0.5	1.5	0.0	0.5	0.7
Relational attitudes	8. Established relational norms	1.4	0.0	0.7	0.1	0.0	0.44
Team working quality	9. Communication	0.0	0.0	1.3	1.3	0.3	0.58
	10. Coordination	2.0	2.5	0.5	0.5	0.5	1.2
	11. Balanced contribution	0.3	0.3	0.7	1.0	0.7	0.6
	12. Mutual support	0.7	0.7	0.3	0.5	0.0	0.44
	13. Aligned effort	0.3	1.8	0.0	2.0	0.0	0.82
	14. Cohesion	n/a	0.7	0.0	1.0	0.3	0.5
	15. Affective trust	n/a	0.7	1.1	0.8	0.5	0.78
	Average	0.62	0.93	0.78	1.0	0.28	

The sub-criteria with a final average score of 1.0 point or higher for this entire study are:

2. Team integration: The extent to which the owner and the contractor teams are structured and integrated as a single team with no apparent boundaries (Suprapto, 2016).

4. Efficiency: The extent to which the project met the planned budget and schedule (Suprapto, 2016).

5. Quality: The extent to which the project progressed or completed safely, meeting the targeted quality, reliability, operability (Suprapto, 2016).

10. Coordination: The extent to which the teams achieved synergies in coordinating interdependent activities (Suprapto, 2016).

Even though these sub-criteria have the highest average scores, it is not evident that these are always points of improvements for every Bouwteam. Sub-factor 10. Coordination, for example, has high scores for Bouwteam Alpha and Beta, but low scores for Bouwteam Gamma, Delta and Zeta. It is difficult to draw general conclusions regarding all Bouwteams based solely on RECAP data from five Bouwteams. However, the information of the RECAP matches the information of the other data sources (desk study, observations and interviews).

For example, Beta has the highest average difference (after Delta, whose participants did not fill in the RECAP survey correctly). Through the interviews it was also evident that the client and contractor didn't establish a good collaborative relationship. Beta and Delta also both have a high difference on sub-factor 13. Aligned effort. This too was already affirmed through the interviews.
The results of the RECAP of Bouwteam Zeta show very little difference in opinion about the collaborations between the client and contractor. This was also concluded by the information from the other sources. The client and contractor of Zeta both indicated to be very happy with the collaboration and the end result of the Bouwteam.

Aside from the information acquired through the desk study, observations and interviews, the RECAP survey did not provide much new information about the cases. It did however serve well to highlight and confirm similar bottlenecks as was found in the other sources. The RECAP results can thus be used to give extra credibility to the findings in the other sources.

Reactions RECAP
Interviewees were very positive about the RECAP survey. The statements were interesting and they thought it would be a great basis for conversations about the possibilities for improving the collaborative relationship. As mentioned before, it points out the sour spots within the collaborative relationship, providing the opportunity to discuss and improve those points.

5.5 Summary cross case analysis

To conclude this chapter a summary is given of each of the ten subjects that stemmed from the collected information of all data sources. For every subject, a summary is given of the findings of cross case analyses. Based on these findings the researcher came to one or more obstacles that could be a point of attention in every Bouwteam. For these obstacles, recommendations are given to optimise a Bouwteam. These recommendations are based on the success factors seen by the researcher in the different Bouwteam cases, as well as those named by clients and contractors during the interviews.

Table 4; Summarized finding of the cross case analysis, obstacles and recommendations

1. Reasons for a Bouwteam (Tender phase)	
Summarized findings:	Obstacles:
A Bouwteam was chosen for the following reasons: - Time pressure - Risk distribution - Project complexity - Design optimization by contractor - Client keeping his influence on the design - Bad experience with traditional procurement methods - More collaboration - Gaining experience in Bouwteams Contractors indicated that the goals, expectations and reasons for choosing a Bouwteam of the client are not clear from the tender documents.	➔ Too often, the client wants the benefits of a Bouwteam, but not the responsibilities, and is not prepared to be actively involved. In those cases, a Bouwteam creates the wrong expectations amongst the contractors. The contractors are expecting more collaboration, while the client wants to work together as if it is an integrated project. However, the client wants to keep more influence on the design. ➔ The client chooses a Bouwteam for the wrong reasons. ➔ Unexperienced clients often have wrong expectations of a Bouwteam or may want a Bouwteam for the wrong reasons.

	➔ Wrongly formulated tender/project/process descriptions.
Recommendations:	
• The reasons to choose a Bouwteam need to be balanced. • The reasons for which a Bouwteam is chosen, need to be clear to the potential contractors, because the reasons for which a Bouwteam is chosen explain a lot about the expectations from the client. • A third party (Antea Group) can help the client to choose a Bouwteam for the right reasons, and help to create realistic expectations.	
2. Procurement criteria (tender phase)	
Summarized findings:	Obstacles:
Regarding the tender phase it became clear that: - Client had little experience in Bouwteam and the associated tendering procedure. - Procurement criteria was sometimes seen as vague and subjective. - For the client is was difficult to make a clear distinction between the potential contractors, based on the criteria. - For the contractors it is difficult to be distinctive from the other contractors and estimate their chances of winning.	➔ Bouwteam participants do not see their inexperience as a threat for a well functioning Bouwteam. ➔ The tendering procedure for a Bouwteam is often different from the procedures the client is used to. The assessment on quality instead of (lowest) price asks for a different approach. Often the focus of the criteria is on the collaboration and whether the potential contractor will be able to collaborate in the way the client has in mind. Soft skills become more important but are hard to judge with completely objective criteria.
Recommendations:	
• A third party (Antea Group) should help the client to guide them through the Bouwteam process and help them to set the right procurement criteria, especially when they are inexperienced. • At least one of the tender assessors should have experience and be able to explain the procedure to the others in advance. • Strive for ‘hard’ criteria, with little room for discussion or personal opinions. • Formulate the criteria and requirements as SMART as possible.	
3. Price element (tender phase)	
Summarized findings:	Obstacles:
In different Bouwteams, different ways are used to keep grip on, or total control over, the price of the project: - Maximum project budget (frequently used) - Fixed prices for materials - Fixed percentages general costs (‘staartkosten’) - Total available budget - Procurement on lowest price - Fixed material and service prices - No price element at all	➔ The opinions are very divided between ‘Yes, definitely a price element’, or ‘No, absolutely not’. There is not one ‘best’ way. ➔ When clients have bad experiences with the price negotiations of a project, they tend to prefer to fix as much of the price as possible in the tender phase.
Recommendations:	
• The more risks, undivided scope or uncertainties in a project, the harder it is to fix the price or part of the price.	

4. Project Start-Up (PSU) (design phase)	
Summarized findings:	Obstacles:
- When time pressure is a reason to choose for a Bouwteam, the client likes to start with the project as soon as possible and the PSU is regularly skipped or kept minimal. PSU can be project focused and be used to: - Introduce the project - Indicate risks - Define the scope PSU can be process/collaboration focused and be used to: - Express expectations to each other - Get to know each other - Find the strong and weak points of the team - Build up trust	➔ The value of the PSU is often underestimated. Often the client and/or the contractor do not see the need for a PSU and think it is a waste of time. ➔ PSU is used just to introduce the project, not the team. ➔ When a more process/collaboration focused PSU is skipped, often the goals and expectations about how to collaborate are not discussed.
Recommendations:	
• The PSU is very important, make sure to invest time in the PSU. • The PSU is the starting point of a collaborative relationship. • Pay extra attention to inexperienced Bouwteam participants during the PSU. • Discuss each other's expectations of the Bouwteam, and make sure the team understands each other. • Realize the PSU is the starting point of the collaboration, but investments in the collaborative relationship during the project must be made as well.	

5. Tasks distribution and expectations (design phase)	
Summarized findings:	Obstacles:
- Within the observed Bouwteam project, it was often seen that the contractor is given the lead. This is done to actively involve the contractor and prevent the contractor from being passive and traditional. - When the contractor is given the lead, the client expects most of the tasks from the contractor, as a client is used to in more integrated projects. - Municipality's or governments like to use a mirrored organisation within a Bouwteam.	➔ Every construction team is different and has a different tasks distribution. ➔ Within Bouwteams, there is a lot of misunderstanding about who does what. ➔ Everyone has its own expectations which often differ from the other participants. ➔ Expectations about what the contractor sees as his tasks are often unrealistic, and vice versa. ➔ A mismatch of expectations often results in frustration. ➔ Traditional attitudes of client and contractors are an obstacle.
Recommendations:	
• It is very important to describe and discuss the expectations from the Bouwteam participants, before the tender phase. • Explain and discuss the specifics of *this* Bouwteam with all involved participants to clear ambiguities and make sure everyone is on the same page.	

6. Collaborating needs more than the contract (design phase)	
Summarized findings:	Obstacles:
- It is often thought that collaboration will occur automatically by signing the Bouwteam contract and that it doesn't need special attention. - There is a lot misunderstanding about what collaboration implies.	➔ The Bouwteam participants are often inexperienced and find it hard to collaborate in the right way. ➔ A Bouwteam contract does not automatically lead to a good collaborative relationship. ➔ A collaborative relationship needs time and care which is not (made) available.
Recommendations:	
Make sure that everyone shares their expectations about the collaboration. • Do not think everyone thinks the same about collaborations, make sure to formulate the meaning of collaboration together. • Make agreements about how to collaborate and what is expected from a collaborative relationship. • Meet regularly, and try to meet for more than just an 'official' meeting. For example, work together on one location for (part of) a day a week.	
7. Decision making (design phase)	
Summarized findings:	Obstacles:
The design phase does not always run as smoothly as wanted, amongst others because: - Requirements of information changes. - The client keeps requesting changes to the design. - Options are reconsidered after decisions are made.	➔ Double work ➔ Extra time and costs ➔ Stagnation of the project ➔ Decrease in motivation ➔ Frustrations
Recommendations:	
• Make sure everyone agrees to the planning with milestones and decision-moments. • The contractor should provide enough time for the client to make decisions. • Make sure the right people are present to make the decisions. • Introduce a project leader for both the client's and the contractor's company who will hold the participants to their agreements.	
8.Openness and honesty (design phase)	
Summarized findings:	Obstacles:
- Openness and honesty are naturally very important - Openness and honesty become more important when situations become more tensed. - It becomes more difficult to be open and honest when there are difficulties in the project. - Exposing yourself gives the risk of losing more.	➔ Participants become more secretive when things become more tensed ➔ Information is not shared ➔ Frustrations are not discussed and increase over time.
Recommendations:	
• Meet regularly during the design phase, at least once every two weeks. • When money is available, appoint an 'independent' process manager, who is responsible for the collaboration and integration of the team. The process manager	

can address the team or individual participants when they are not working according to the agreements.
- Set a standard evaluation point at the end of every meeting agenda to give the opportunity to discuss good points and points of improvement.
- Make sure the collaboration is based on equality. What the client expects from the contractor should also be done by himself.

9. Price negotiations (price negotiation phase)	
Summarized findings:	Obstacles:
In almost every Bouwteam, the price negotiations bring tension within the team, due to different reasons: - Sometimes the price negotiations take too long and delay the project. - Participants are afraid for a hidden agenda. - Often there is a misunderstanding about the agreements on price (for example if the cost for the design phase are included in the total project budget, and when those cost are payed to the contractor). - The design is too expensive. - The budget is insufficient. - The client is afraid the price will be too high because the contractor has no competition.	➔ At the time of price negotiations the contractor has little competition. ➔ The project cost is calculated late, with little time left for modifications when the price turns out to be too high. ➔ No transparency about the prices (of sub-contractors).
Recommendations:	
• Work with an open budget estimation. • Let the cost estimate run parallel to the development of the design. This makes it possible to see whether certain options are feasible or not. • When the client has a cost estimate before the tender phase, it is helpful to compare this cost estimate with the first one of the contractor. In this way it will be known in an early stage if the price the client has in mind will be feasible. • Fix the general costs (staartkosten) at the beginning or with the tender. • Make agreements between client and contractor regarding sub-contractors.	

10. The construction (construction phase)	
Summarized findings:	Obstacles:
- Often, the construction of a Bouwteam runs very well. - There is little additional work and little discussion about the cost of the additional work. - Little addition is needed to the design for construction. - Risks have been well examined and well managed.	➔ The more complexity, risks or uncertainties a project faces during the construction phase, the more a Bouwteam is inclined to continue the collaborative relationship of the design phase during the construction phase.
Recommendations:	
• The construction of Bouwteam projects are often going well.	

Concluding remark of the cross case summary

The collected obstacles in this section do not occur in every Bouwteam, but should always be a point of attention. The recommendations given are primarily meant to solve the obstacles, but may also be applicable without the obstacles occurring in a Bouwteam. The table 4 with the summary of all ten subjects discussed will form the basis for the expert meeting presentation. The expert meeting will be used to sharpen the recommendations and transform them into success factors which every Bouwteam should aim for to reach the benefits a Bouwteam has to offer.

6 | Expert meeting

The cross case analysis gave insight into which obstacles can be found in Bouwteams. The chapter concluded with recommendations from both the Bouwteam participants and the researcher, on how to overcome these obstacles. In this chapter, the expert meeting is discussed. The expert meeting is a meeting with three senior contract management advisors from Antea Group (the experts) who have a lot of experience in working with Bouwteams. The experts have been preparing the tender phase of Bouwteams, drawing up Bouwteam contracts and managing the Bouwteam process. In this meeting the focus was on the ten subjects presented in table 4, essentially the results of the cross case analysis and the coupled recommendations. The experts were asked to pay specific attention to two points during the presentation: *1) if they recognized the findings and obstacles of the individual cases and if they found them representative for Bouwteams in general,* and *2) if they agreed with the suggested recommendations to optimize a Bouwteam.*
Based on their knowledge and experience the findings in table 4 could be validated and optimized. The goal of this discussion with the experts was to translate the established recommendations into actual success factors for Bouwteams. The total transcript of the expert meeting can be found in Appendix F.

The set up and execution of the expert meeting is described in section 6.1. In 6.2 the discussion about the ten subjects is discussed. The comments and additions of the experts are written down per subject in this section. In section 6.3 the extra statements are further introduced, followed by the comments of the experts on each statement, showing if they thought differently about certain subject before and after the presentation and discussion. The chapter concludes with section 6.4, giving an evaluation of the two points the experts were asked to pay specific attention to and the resulting success factors for a Bouwteam.

6.1 Expert meeting set up

Upon arrival, the three experts were asked to first individually give their opinion on four statements (section 6.3), drawn up by the researcher based on the results of the cross case analysis, as an extra part of the expert meeting. The goal of the statements was to bring specific focus to four recommendations in a dynamic way. The experts were asked to, individually, agree or disagree with each of the four statements before anything was presented to them. In this way it was possible to capture the experts' opinions before they could have been influenced by the presentation or each other. When the experts were finished with the statements the meeting continued with a presentation.

After a short introduction of the study and the methodology, the cross case summary (table 4.) was presented. The experts then went on to discuss the ten points one by one during the presentation, adding to the findings, commenting on the recommendation, sharing their own experiences, or asking for more explanations. The presentation and discussion took one and a half hour before all ten subjects had passed the review. After a small break, the meeting continued with discussing the statements and the experts' opinions on them, providing a more in-depth discussion up till the end of the meeting. The presentation of the cross case summary was very well received. All three experts thought it was an informative presentation and discussion, which provided new insights and food for thought, even for them.

After the presentations the four statements were discussed together with the opinions of the experts about the statements.

6.2 Comments of the experts on the cross case analysis results

The ten subjects were presented one by one and directly discussed by the experts. Comments on each of the ten subjects made by the three experts are summarized in this section. The comments consist of confirmations, additions or suggested changes with respect to the recommendations.

Experts comments on: 1. Reasons for a Bouwteam

The experts agreed that often more than one reason is used for choosing for a Bouwteam. Innovation was added to the list of reasons to choose a Bouwteam. A Bouwteam is ideal for complex projects, projects with complex surrounding areas, technical complexity, many stakeholders involved or political difficulties.
When a client chooses a Bouwteam to share the risks and wants to have design responsibility, he should not think that the contractor will (easily) accept the risk when the client is the one making design decisions.

Experts comments on: 2. Procurement criteria

Options to assess soft skills with hard criteria are not easy to find. One option could be to ask the contractor to give a reference of former collaboration agreements or Bouwteams and customer satisfaction assessments.
Ideally, a good process results in a better product. That is why most Bouwteam selection criteria focus on the collaboration instead of the product. Unfortunately, the ideal Bouwteam is not often found in practice. The experts agreed that the focus of the used procurement criteria is often too much on collaboration and not on the product itself. This is seen as a missed opportunity. There should be a better balance between the criteria assessing the process and the criteria assessing project specifics.
For the selection itself, at least three, and preferably five, assessors should be assessing the potential contractors to keep the subjectivity as low as possible.
The experts concluded that a third party, like Antea Group, can help the client formulate the right criteria, but that it remains a difficult matter with no readily available solution.

Experts comments on: 3. Price element

They recognised the variety in different options used to include a price element in the procurement criteria. The experts agreed that it is important to at least give some indication of the budget in the tender phase as expectation management for the contractor. Fixed material and service prices are not seen as the solution to have more control over the construction price. The experts are of opinion that the contractors are smart enough to come to the price they want you to pay. It is very important that the client knows what he wants and what he will be able to pay for the job. It was recognized that the client should act more professional compared to most current situations within Bouwteams. Clients should be able to clearly formulate what they need and what they want from the contractors.

Experts comments on: 4. Project Start-Up (PSU)

The experts fully agreed that the Bouwteam participants should take the PSU more serious. The ideal PSU focuses on the collaborative relationship, but uses the time together to discuss the project as well.
Organizing a good PSU does not mean the rest of the process will automatically continue in good collaboration. The PSU is the start of the collaborative relationships within the Bouwteam and will need further care and attention during the project. In that way, there is time to build up trust and become more open and honest with each other.
The experts often noticed that during Bouwteams the client or contractor does not see any value in the PSU and does not want to spend a lot of time on it. If this is the case and they like to focus on their own task without too much collaboration or integration, then the Bouwteam is not the right approach for them.

Experts comments on: 5. Tasks distribution and expectations

The experts recognised the misunderstanding in task distribution, and could give several examples of when there were misunderstandings and differing expectations. Those misunderstandings are often shared during the evaluation when the project is finished and you are not able to change anything anymore to this Bouwteam. Therefore, they agreed that it is very important to give an elaborate description of the tasks and expectations before the project starts. The challenge in this is that you want to be specific to prevent misunderstanding, but also leave some room for adjustments and changes.

One of the biggest risks in a Bouwteam is the pitfall of traditional thinking. Often the hierarchical division of roles is still the same as in the traditional projects. In theory, this inequality should not be there, but is almost unavoidable in practice, because the Bouwteam participants are used to working in this way, and because the client needs to make the decisions and give the final consent. Equality can specifically be stimulated by the client, by doing the same things the client would expect from the contractor. To give a simple example: often the Bouwteam meetings are planned at the venue of the client, but change this and organise half of the meetings at the location of the contractor.
The experts have seen it occur often: the client becomes less actively involved when the contractor is in charge, but also vice versa. The contractor then waits inactively when the client takes charge. To avoid this it is important to make specific task descriptions.

The conclusion is that collaboration should be on an equal basis for it to function better. How this should be done in practice is still difficult. Among others because the client keeps the responsibility for the end result. An independent project manager might help, but there has to be enough budget available to pay him. This independent project manager would also be able to manage the process of a Bouwteam and to steer the integration and collaboration of the team in the right direction.

Experts comments on: 6. Investing in collaborating

A more open and sharing attitude will improve the collaboration. It would solve a lot of the misunderstandings and frustration. A collaborative attitude is partly determined by culture and habits, but can be stimulated by providing the facilities for an open attitude. It is important to show in the tender document that collaboration and openness will be very important in the Bouwteam. The tender phase can already damage the chances for a good collaboration. The client must be well aware that the project already starts with the tender and that it is important to make a right start. The client must also be open and honest about the project and what is expected of the potential contractors. In addition to this, the PSU can be used to start the collaboration and set everyone in the same direction.

Experts comments on: 7. Decision making

It is important to keep the process of the design running, hence the Bouwteam should include people who have the authority to make decisions. In addition to discussing the planning together, the mutual planning should actually be made together to ensure all related activities are listed in the planning of the contractor and the client.

Experts comments on: 8. Openness and honesty

The experts agreed with the results presented on this point. They suggested to take the meeting a step further and even start working on the same location for (part of) one day a week. Not only at the office of the client, but also at the office of the contractor to cater to more equality between the client and the contractor.
Expert: ‘Put them (the client and contractor) together in one location, one shared coffee machine, and 80% of the problems are solved.’

Experts comments on: 9. Price negotiations

Work with an open budget estimation, but only when the construction contract will be in the form of a RAW-bestek/UAV. Not when an UAV-gc will be used in the construction phase. Often the budget of the Bouwteam is not sufficient, potentially because the contractor can ask more than when he has to win the bid from 3 other contractors, the competition is small in the price negotiation phase. Another reason for insufficient budget is that the client keeps adding more requirements to the project and wants more than was thought in the beginning. A smooth process is good for everyone and will save everyone money, but it is difficult to convince all the different stakeholder that investing in collaboration is essential in achieving a smooth project process.

Experts comments on: 10. The construction

The experts agreed that most of the time a Bouwteam results in a very smooth construction phase, with little additional work or changes needed in the design. Even when the design phase or price negotiations phase is not running according to plan, the execution often stays within the planning and budget.

6.3 Statements and discussion of the statements

The statements are developed by the researcher as an extra item in the expert meeting to give it more dynamic and trigger the experts in a different way. Another reason to add these statements to the expert meeting was to be able to get the uninfluenced opinions of the experts on those subjects and see if their opinions would change after presenting and discussing the results of the cross case analysis. Per statement the experts had to choose between Agree and Disagree, and were asked to add a short explanation, which was discussed after the presentation.
Statement 1 is different from statements 2, 3 and 4. It was based on a success factor given by one of the interviewed clients. He had given a different perspective on the organisation of the team, which would be an interesting discussion point for the expert meeting. Statements 2, 3 and 4 are based on success factors regularly recommended by clients and contractors, but not always complied with practice. Openness is one of such success factors. All interviewees found openness important, but only in a few Bouwteams a serious effort was made to actually establish openness within the Bouwteam. A similar observation was made by the researcher for the subjects of statements 3 and 4. The statements presented to the experts were as follows:

Statement 1: Regularly, the client falls back into the traditional way of working which is not suitable for Bouwteams. To prevent this, *the client and contractor must both nominate a project leader from their own company who will lead the Bouwteam together.*

Statement 2: Openness in a Bouwteam is often no problem when things are going well. Being open becomes less natural when setbacks occur, for example with regard to time or money. When the project runs less smoothly, it becomes even more important to be open to each other, to be able to come to a mutually supported decision*. One person within the Bouwteam, or a third party, should be specifically responsible for managing the Bouwteam processes, and the cooperation and integration of the team.*

Statement 3: *The design (phase) and price estimation (phase) must run parallel to each other.* The estimated price before the contractor was involved should be compared to the estimated price of the contractor as early in the process as possible. This is to determine if the project is feasible for the estimated price of the contractor and if it's in accordance with the price the client had in mind. It is very important that both client and contractor are open about how they come to the estimated prices.

Statement 4: *An extensive project start-up should never be skipped.* A PSU is the basis for the collaboration and offers the opportunity to express expectations and get to know each other better.

In table 5, the comments of the experts following the discussion at the end of the expert meeting are presented.

Table 5; Statements and comments of the experts

Statements	**A/D** *	**Comments of experts**
1: The client and contractor must both nominate a project leader from their own company who will lead the Bouwteam together.	All disagreed	This point was also discussed during the presentation. The experts disagreed with the recommendation of two project leaders in one Bouwteam. Too many cooks will spoil the broth. But the idea of appointing one participant of the clients company and one of the contractors company to keep the participants of their own company focussed was seen as a good option.
2: One person within the Bouwteam, or a third party, should be specifically responsible for managing the Bouwteam processes, the cooperation and integration of the team.	All agreed	What was seen as a better option than statement 1 is an independent process manager, who is focused on the process and functioning of the Bouwteam. It is important that this process manager is as independent as possible to keep his credibility for both the client and the contractor. It is especially good to have a process manager when the participants or a part of the participants have no experience with Bouwteam. The process manager should be an addition to the standard establishments to stimulate the teamwork processes.
3: The design (phase) and price estimation (phase) must run parallel to each other.	All agreed	When the client has a cost estimate before the tender phase, then it is helpful to compare this cost estimate with the first one of the contractor. In this way it will be known if the price the client had in mind will be feasible in an early stage. This should not be done too early either, in order to prevent that the contractor will not look for better solutions but just copy the design the client used to make a cost estimate. The experts also mentioned that the 1992 Bouwteam contract model is outdated on this point. The design and price negotiation phases are set up as two different phases following each other. This should be changed.
4: An extensive project start-up should never be skipped.	All agreed	This subject was discussed during the presentations. All agreed that the PSU is very important to start a healthy collaborative relationship. Not only a PSU but a 'Follow-up' as well.

* The experts were asked to select agree or disagree for every statement. They gave the same answers to the same statements.

The statements were scored by the experts *before* the presentation of the ten subjects, but discussed in detail *after* the presentation. Not a lot of new insights were gathered by the

discussion of the statements, since most had already come up during the discussion of the ten subjects. What can be concluded is that the experts have the same line of thought compared to each other, which is reflected in identical scores for all the statements. The given scores are in line with what had been said during the discussion of the ten subjects, which gives the impression that the experts spoke freely without being influenced too much by the other experts present.

6.4 Conclusion of the expert meeting

The expert meeting proved to be very informative for both the researcher and the experts, and a lot of information was shared about Bouwteams. As a recap, the experts were 1) asked if they recognized the summarized findings and obstacles of the ten subjects and if they found them representative for Bouwteams in general, and 2) if they agreed with the suggested recommendations to optimize a Bouwteam. Through the discussion that followed from the presented subjects, missing obstacles were added and recommendations were improved to better optimize a Bouwteam. The conclusions are listed below.
The experts agreed on the obstacles associated to the different subjects, and deemed them representative for the Bouwteam in general. They agreed with the recommendations, with the exception of a few, and helped to optimize them in the success factors.

1) In general the experts recognised the findings of the case study. They indicated that the obstacles of the ten subjects were real obstacles they had also faced themselves in several Bouwteams. The most relevant obstacles for a Bouwteam, as concluded from the discussion with the experts, are the following:
Too little attention is given to the tendering of a Bouwteam. Often the client is not able to communicate clearly what they want from the contractor through the tender document. Choosing a Bouwteam for the wrong reasons gives a wrong basis for collaboration. The wrong criteria for the selection of a contractor can lead to a subjective selection and a contractor who does not fit the job even though he does fit the criteria. Setting the right criteria is difficult especially for an inexperienced client. There are no standardized guidelines for setting the criteria or for deciding whether to include a price element as one of the criteria. Collaboration is too often taken for granted, whereas good collaboration is what gives the Bouwteam its benefits over other contracts. One of the biggest risks in a Bouwteam is the pitfall of traditional thinking. Price negotiations often go wrong when agreements are misunderstood, when things change, or when a price estimation is made to late.

2) The recommendations made by the researcher were, in general, found relevant by the experts. Through discussing the recommendations the experts and the researcher translated the recommendations into the following success factors, presented here under the Bouwteam phase to which they can apply:

Success factors for the tender phase

The Bouwteam already starts with the tender. The tender should be open and honest and make clear to the potential contractors that collaboration is very important in this project. When a client expects the contractor to be open and honest, then the client should be open and honest as well. All participants must be willing to collaborate within a team.
For the selection criteria it is good to involve a third party with Bouwteam experience, who can help the client formulate what they want and translate those demands into criteria. The third party will be able to help the client to be more professional. It is not necessary to include a price element as a criteria. Something like material price will not help, because the contractor will still find a way to get payed what he needs, but a price indication should be given by the tender to give the contractor an idea of the size of the project.

Success factors for the design phase

The PSU is the starting point of the project and the collaborative relationships within the Bouwteam. Expectations about the Bouwteam in general, the form of collaboration, and tasks distribution, should be shared at the beginning of the project. The PSU is very suitable for this conversation. Agreements should be made about how the participants will work together in practice and how they will make sure they uphold the agreements, even when things will go south. Next to this, a joint planning should be set up together, which holds all project related actions of the client and the contractor. The planning should include deadlines and decision moments, and show who and what information is needed to make the decisions. One Bouwteam participant should get the responsibility for keeping the planning and for holding the other participants to their promises. He should steer the Bouwteam into the right direction regarding teamwork, openness and honesty. Building up trust starts at the PSU and needs to be maintained with regular meetings, or even working together in one location. By giving room for evaluation at every meeting in the form of an ‘evaluation point on the agenda’, it is easier to discuss what went well and what can go better, and keep the setting open and honest.

Success factors for the price negotiation phase

For a smooth price negotiation phase a good preparation is key. Agreements about price should be discussed at the beginning of the Bouwteam, including what will happen when things will change regarding scope or price. The price should be estimated parallel to the development of the design, starting in the early phase of the design phase. This gives the opportunity to see in an early stage of the design if the project will be feasible for the budget the client had in mind.

Success factors for the construction phase

The construction phase already runs well in most Bouwteams because the preparations of the constructions are done in collaboration with both the client and contractor. When the tender, design and price negotiation phase run smoothly and with integrated collaboration between the client and contractor, the construction will do so too.

7 | Discussion

In this chapter feedback is given on the problem statement as given in section 1.3. Is the problem stated at the beginning of this study actually solved? Consequently, the findings of this study will be validated by literature. Next the reliability and relevance of the results are discussed, and limitations to the research are posed. Finally additional findings to the results are briefly reviewed too.

Problem statement feedback

The Bouwteam contract model is seen as outdated by many practitioners of Bouwteam. This can be found in literature (Chao-Duivis, 2012) as well as in practice. Despite this, how to best form a new contract model that fits the current construction industry is still not clear. The current Bouwteams do not always achieve the foreseen benefits and often face struggles during the project. A shared conclusion of different studies about Bouwteams is that there should be more focus on establishing a better collaboration between the client and the contractor of a Bouwteam. Much research has been done about how to establish a better collaboration, but how this translates to a Bouwteam is not very evident. That is why the research question of this study is: How can the benefits of the Bouwteam be achieved in construction projects?

In this study it has indeed been found that establishing a good collaboration is the difficult part of running a successful Bouwteam. Three of the five Bouwteam cases of the case study struggled with obstacles related to collaboration. By revealing the obstacles faced in the current five Bouwteam projects it was possible to formulate a list of general obstacles for a Bouwteam, as can be found in figure 12. Once the obstacles that are relevant in practice had been identified, solutions could be found for these obstacles. Through the information collected by the case study and through comparisons between the cases, it was possible to formulate recommendations to overcome the obstacles. These recommendations are validated and sharpened into success factors for any Bouwteam to reach the benefits a Bouwteam has to offer. To really solve the problems of the current Bouwteam, one more crucial ingredient is needed: the willingness of the Bouwteam participants to invest in the collaborative relationships within the Bouwteam, and to follow the success factors so as to prevent the obstacles from eliminating the benefits a Bouwteam can offer. Therefore, as a last success factor from the researcher herself, for the implementation of the conclusion of this study, it is vital to make sure that one participant of the Bouwteam will be responsible for the collaborative relationships within the Bouwteam and really stimulates the rest of the Bouwteam to invest in this collaboration.

Validation by literature

The first step in validating the results of this study is done by comparing the findings of this study with existing literature. For this validation, literature about Early Contractor Involvements (ECI) in general is also used since Bouwteam is a form of ECI.

Some of the obstacles found by Boijens in his study were that the requirements did not match the budget, participants were too focused on self-interest, and expectations of the functioning of a Bouwteam were too high. Also, missing information at key moments, too late involvement of contractor and a missing ‘Bouwteam’ attitude by the participants (Boijens, 2008). The study of Lagemaat (case study of three Bouwteams) concludes that too much formal budget control will hamper the collaborative relationship of the Bouwteam participants (Lagemaat, 2015). The lack of a sufficient collaborative relationship between the client and the contractor in general is also seen as an obstacle in collaborative contracts (Suprapto, 2016; ten Hoeve, 2018). In line with this the study of Rahman & Alhassan shows that unwillingness for collaboration or uneven commitment to the project are obstacles for successful ECI project.

The obstacles found in literature were also found in the cases examined in this study. The most common overlapping obstacles are related to the lack of appropriate collaborative relationship and a corresponding collaborative attitude. Other obstacles named in literature and confirmed in practice are mismatch between budget and requirements/cost, too high expectations and missing information at key moments. Aside from too high expectations, this study also found that wrong expectations of the Bouwteam functioning in general was an obstacle. Other obstacles identified in this study were choosing a Bouwteam for the wrong reasons, wrong tender, wrong selection criteria, inexperienced client, misunderstanding between the client and contractor and late price negotiations. The obstacles found through this research are more specific than the ones which can also be found in literature. One obstacle named in literature, too late involvement of contractor, was not found as in obstacle in this study.

As success factors in literature, the study of Boijens showed three important factors; requirement of a minimal level of social and management skills from all Bouwteam participants to stimulate collaboration, setting up go/no go moments to check if the requirements still fit the cost and time planning, and openness about the available budget from the beginning of the Bouwteam (tender phase) (Boijens, 2008). Also Lagemaat finds success factors which focus on collaboration, planning and budget, concluding that cost estimates during the design phase and building up trust are success factors of a Bouwteam(Lagemaat, 2015). Also Sodal, who studied the early involvement in 'design teams', concludes that it is very important to establish mutual trust and respect (Sødal et al., 2014). Respect and equality between client and contractor is found to be a success factor for a good relationship in a Bouwteam (Jansen & Metsemakers, 1999). According to ten Hoeve, for a good collaborative relationship between client and contractor it is essential to find a contractor who is willing to collaborate and a client who is willing to invest in a good relationship (ten Hoeve, 2018). The conclusion of Rahman & Alhassan's study also shows that 'trust and communication, along with frequent interactions'(Rahman & Alhassan, 2012) help parties to achieve the benefits of a Bouwteam.

All success factors found in literature were also found through this study. Most of the success factors of this study are more specific and easier applicable in practice. Success factors from literature are related to the importance of trust, respect, openness, communication, and (willingness to) collaboration. Some success factors in literature were more specific like; go/no go moments, cost estimate during the design phase and investing in a good relations through frequent interactions. These were also found through this study.
In addition to the success factors which were found in literature, this study comes with more success factors; open and honest tender, setting the right selection criteria (with help of a third party), always start the Bouwteam with a PSU, discuss expectations, select one participant who will be responsible for managing the Bouwteam processes, use evaluation moments (which is comparable to go/no go moments) and make the price estimates parallel to the development of the design.

By carrying out case studies on several real-life real-time projects obstacles and success factors relevant in practice were found. By validating the findings from the case study with literature, it was found that the obstacles and success factors of this study were relevant, but they were found scattered all over existing literature. Most important success factors of literature to reach the benefits of a Bouwteam is a collaborative relationship between client and contractor and open price negotiations. In this research more specific success factors are given to reach, amongst others, a collaborative relationship between client and contractor, and thereby the benefits of a Bouwteam.

Reliability

Number of cases

The five case studies provided a lot of useful information and many of the revealed obstacles were deemed relevant for Bouwteams in general. However, using more than five cases could have given a broader overview of the predominant obstacles recurring in any Bouwteam. This could have reduced the likelihood that one of the obstacles now accepted in this study, is actually an outlier, and specific to a certain bouwteam. On the other hand, this study used multiple data sources (literature study, desk study, observations, interviews and a survey) and the results rarely contradicted each other, and often even confirmed each other. This shows that though the number of data points (cases) may have been limited, the answers are consistent and therefore fairly reliable in the context of this study.
The only large difference found between data sources is between the literature study and the findings from practice in this study. The 3 main differences are highlighted (grey box) at the end of chapter 4. This difference poses less of an issue and is actually a confirmation for the need of this study, showing that there is a gap between what is written in literature and what is experienced in practice.

More case studies would also have been beneficial for the averaging of the RECAP results (right most column in table 3). With more cases the average value of each of the sub-criteria would be more reliable. In the case of sub-criteria 1 (Front-end definition) for example, the average score is 0.48 and therefore not researched further. However, Bouwteams Beta and Gamma scored quite high on this sub-criteria, indicating that this is rather important for 40% of the cases. Hence more cases for the RECAP could strengthen the decision to pay more or less attention to specific points concerning collaborative relationships.

Bias

A possible form of bias, inherent to the methodology of this study, is the weight each of the different data sources carry. The desk study and observations were thought to be less crucial for gathering data than interviews. This is because the most extensive data was gathered from interviews, and this data came first hand from people involved in the Bouwteams. Observations at meetings and the surveys filled in by the Bouwteam participants were always subjected to being filtered by some form of interpretation by the researcher. The desk study showed little more than facts, when in fact it appeared that most tensions in a Bouwteam do only come across in the field. However, the data source that may be deemed most important, is also the one most subjected to bias because with tone and language a lot can be insinuated during interviews. The interviews were also carried out individually possibly allowing for bias in the participant's answers since no one was there to check its validity. It would be very difficult to quantify the weights given to each of the data sources, and as said before, they barely contradict each other, reducing the need for such a quantification, but it is an important note to keep in mind.

Assumptions

The researcher also made some choices in this study which could have influenced the results. One such choice was to focus only on RECAP sub-criteria with an average score greater than 1. This is also done in Suprapto's study, but more care could have gone in choosing the cut-off value or analysing a sub-criteria further, especially considering the fact that there were only five cases this time.
Another choice made by the researcher was the choice for the ten subjects to be focussed on in the cross case analysis. This greatly steered the direction of this study. The choice for the ten subjects was made with great care, derived from information from literature and the case study, but could still be seen as subjected to bias, and possibly unfounded. However, the ten subjects were presented and discussed with several experts in de field of Bouwteams. This expert meeting can be seen as a validation of the results of the cross case analysis, more specifically of the ten subjects chosen. During this discussion there was room

to suggest other subjects that could be of influence. However, in the expert meeting it became clear that the ten subjects were found very relevant, and the adjustments and additions suggested in the meeting made the subjects even more relevant and more widely applicable.

An adaptation made by the researcher was to slightly adapt the RECAP survey. The RECAP of Suprapto was initially developed for big collaborative contracts like alliances. Unlike alliances, Bouwteams are also used for smaller projects. The RECAP was therefore not entirely suited for this research. This was not a drastic change, only two sub-criteria were left out and a few statements were adapted to also better fit smaller collaborations in the construction industry. It is unlikely this change reduced the reliability of the results, if anything, it has actually made the survey more applicable to Bouwteams thus making the tool more relevant for acquiring data in this study. However, it must be said that this slightly adapted RECAP used in this study, unlike the original RECAP survey, was not tested extensively to see whether the adaptations had consequences on the results of the RECAP. The sub-criterion 'senior management' was left out of the RECAP, because it did not seem relevant to the researcher for the Bouwteam cases studied. The RECAP was originally made for large construction projects that have much influence on the client's image. In these big projects, senior management is closely involved because failure of the project would have major consequences. Hence the sub-criterion 'senior management' is essentially about the involvement of the senior management in a project. Since the Bouwteam cases studied were relatively small, it didn't seem likely for senior management to be involved in these projects. In retrospect, it could have been more interesting to have included the senior management sub-criteria than was anticipated, because senior management was often more involved in the cases than thought beforehand. This was usually because the Bouwteam method was new within the company. By leaving out the sub-criterion it is not known if this had an influence on the collaborative relationship between the client and the contractor. However, it is also unlikely that including it would change the results of the other sub-criteria. It is perhaps a missed opportunity for even more insights into the functioning of Bouwteams.

Limitations to methodology

Originally the plan was to observe several meetings per Bouwteam. In the beginning of this study this seemed reasonable based on the positive reactions of Antea Group employees about carrying observations during Bouwteam meetings. However, Antea Group employees were not the only ones who had to agree with an observer being present during the meetings. Often the client of a Bouwteam was not interested in the researcher observing the Bouwteam. For this reason only a few Bouwteam meetings could be attended. This makes it harder to draw solid conclusions.

This study was very focused on the functioning of a Bouwteam in practice, using real-life, real-time, case studies as the main source to draw conclusions from. The literature study done at the beginning was focused on Bouwteam, but not so much on success factors, and even less on collaboration. This was done on purpose, to be able to start the research with a certain degree of impartiality. In the end the expert meeting was used to validate the success factors found in this study, with success. Probably, if prior (literature) research had been done into collaborations and partnerships in general a lot of the success factors would have already come up. One could argue that in essence the fundamentals of a Bouwteam come closer to a general partnership than a project in a construction industry (i.e. the working together gets more focus than what actually has to be done). Hence, a more extensive literature study would have been good to be able to validate the result of the case study better. This can still be done in retrospect, to further add to the list of success factors. However, the method used in this report is still holds its value for this study.

One limitation is that the success factors that were found were not tested in practice. It could have been of added value if the success factors were not only validated in theory, but that it

could also have been observed whether these actually have an effect if it is seen to it that these are implemented in new case studies.

Relevance
Even if the results are deemed reliable, it is still a question whether they are relevant too, and can be used for their purpose.
The literature study concludes with a section about the importance of collaboration and how difficult it is to establish a good collaboration between the client and contractor of a construction project. In the Bouwteam case studies it can be seen that three of the five Bouwteams struggle with starting and maintaining a collaborative relationship. When the Bouwteam participants do not invest in a collaborative relationship, or are not able to maintain it, all kinds of problems occur originating from the lack of collaboration.
So even though this is known, it has been written about in literature, and is experienced in practice, maintaining a collaborative relationship is still not always easily accepted by the Bouwteam participants. For these results to be relevant they have to be put into practice. This is a point for further discussion. The 'how' in the main research question may be identified, but how to actually achieve this in practice, the practical tips & tricks so to speak, must be discussed, or perhaps, better yet be found through experience (trial and error).

This study is also done specifically for construction projects in the civil and infrastructure sector. However, Bouwteams are also used in building and utility construction. As mentioned before what holds for Bouwteams can often also be applicable for collaboration in general. It would have to be further researched and validated to what extend the results from this study can be applied.
More on the relevance of the results for Antea Group in particular can be found in the next chapter under recommendations.

Additional findings
Aside from the main results a few additional findings were gathered throughout this study. These do not directly support any of the research questions but may be noteworthy nonetheless.

- ➔ The price negotiation phase is not an actual phase in practice. The 1992 Bouwteam contract model strongly suggests that the price negotiations start when the design is finished. In literature the price negotiation is thus seen as a separate phase, following the design phase. However, based on this study it has become clear that such a phase doesn't really exist, and isn't advisable either. The price negotiations should be included in the design phase and run parallel to the development of the design. When the price forming runs parallel to the design phase, it is possible to find out in time if the design still fits the budget and whether a change in course is needed to keep the project within budget. This will prevent a lot of rework and frustrations.

- ➔ Aside from not being able to attend as many meetings as the researcher had hoped, it was also noteworthy that the researcher was never welcome at any price negotiations. This may be obvious because money is often a sensitive subject, but there could be a possibility (or even a probability, though that may be suggesting too much) that price discussions always come with some tensions.

8 | Conclusion and recommendations

This chapter concludes this study by answering the five sub-questions, which will add up to answer of the research question: *How can the benefits of the Bouwteam be achieved in construction projects?*
Next to the conclusion in section 8.1, recommendations for this study will follow in section 8.2. The recommendations consist of two parts: recommendations for practice and recommendations for further research.

8.1 Conclusions

SQ1) What is the Bouwteam?

A Bouwteam is a collaboration agreement, with its most characteristic element the early involvement of the contractor (Koning, 2001). In the design phase the client and the contractor work together on the design of the project. In this way the expertise of both parties can be used to optimise the design, in order to subsequently have a smooth construction phase. After the design is completed the contractor, who has already been involved, will be the first and only one to make a bid on the construction job. Only when the client and the contractor do not reach an agreement on the price, the client is allowed to ask other contractors to make a bid for the construction of the project. A Bouwteam follows the same construction phase as other construction projects, only in a different order. The tender phase comes before the design phase. This makes it possible to better integrate the design phase and the construction phase, which can have a positive effect on the overall project success with the benefits a Bouwteam can provide. In theory the main benefits of a Bouwteam are:

- Room for influence of the client and flexibility for the client regarding the design, and more freedom in the design, innovation and creativity for the contractor.
- The use of the contractor's, client's and advisor's expertise all at the same time during the project, and the integration of the initiation, design and construction phase, can lead to optimization of the design.
- Working together in a Bouwteam leads to a better understanding between the client and the contractor.

The way the Bouwteam is being applied has been changing through the years and makes that the Bouwteam contract model of 1992 no longer fits this new way the Bouwteam functions (Chao-Duivis, 2012; van Wijck, 2018). The Bouwteam is used in different ways nowadays, but does not always lead to the expected collaboration and project results. Often the benefits of a Bouwteam are not reached in practice. The benefits of a Bouwteam are strongly dependent on the collaborations between the client and the contractor. The benefits will only be able to be reached when the client and contractor of a Bouwteam establish a collaborative relationship.

SQ2) How is the Bouwteam applied in practice?

From examining the Bouwteams in practice it has become evident that the processes within a Bouwteam are not always the same. It has also shown that the extent to which the benefits of a Bouwteam are reached can differ greatly from Bouwteam to Bouwteam and is often related to the collaborative relationship between the client and the contractor. Bouwteams with a lower collaborative relationship often have less satisfied participants. The benefits of a Bouwteam, as stated in different literature sources, are also seen as benefits by the interviewees of the Bouwteam case studies. The reasons for the client to choose a Bouwteam is often strongly related to these benefits. However, the Bouwteams do not always deliver the expected benefits or meet the expectations, which were often the reason to choose for a Bouwteam in the first place. Three of the five Bouwteam cases showed opportunities for improvements. These three partly face similar obstacles, but also project specific obstacles.
An important difference between literature and what has been seen in practice is the way the price negotiations are presented. Literature describes the price negotiations as a separate

phase following the design phase, while in practice, the price negotiations (often) already start during the design phase.

SQ3) What are obstacles for the Bouwteam?

The obstacles make it difficult to reach the benefits of a Bouwteam or even prevent project success. From the cross case analysis specific obstacles were found, which were adapted and complemented through the expert meeting. Not all obstacles have to occur in all Bouwteams, but the following should always be a point of attention:

× Inexperienced Bouwteam participants.
× An unsuitable project start-up.
× Wrongly formulated tender documents and selection criteria.
× Traditional attitude of client and/or contractor.
× Wrong expectations or difference between expectations of participants.
× Wrong assumptions and misinterpretations of agreements.
× Minimal investment in the collaborative relationship between the participants.
× Stagnation of the design phase.
× Participants are not open and honest about their actions.
× Late cost estimations and difficult price negotiations.

SQ4) How to overcome the obstacles?

Under each of the obstacles mentioned here above an approach is given how to overcome these.

× Inexperienced Bouwteam participants.
× Wrongly formulated tender documents and selection criteria.
  ➔ (Inexperienced) clients should involve a third party from the initiate phase, to advise the client about the Bouwteam. The advising party can help the client formulate what they want and how the client should translate this to a tender, how to formulate the selection criteria, and even help to organise the Bouwteam processes.
  ➔ The tender should be open and honest and make clear to the potential contractors that collaboration is very important in this project.

× An unsuitable project start-up.
  ➔ A good PSU focusses on the collaborative relationship, but uses the time together to discuss the project as well.
  ➔ The PSU should be taken seriously and the participants should realize that the PSU is the starting point of the collaborative relation between the participants.

× Traditional attitude of client and/or contractor.
× Wrong expectations or difference between expectations of participants.
× Wrong assumptions and misinterpretations of agreements.
  ➔ To be able prevent the participant from falling into traditional behaviour it is important to collaborate on an equal basis and provide/make a clear task description at the beginning of the Bouwteam (before the tendering).
  ➔ An elaborated PSU focused on process and people provides a moment to share expectations and get to know each other.

× Minimal investment in the collaborative relationship between the participants.
  ➔ Building up trust starts with a PSU and needs to be maintained through regular meetings and working together in one location.
  ➔ One Bouwteam participant should be responsible to steer the Bouwteam into the right direction regarding teamwork, openness and honesty.

× Stagnation of the design phase.
  ➔ A joint planning needs be set up together, by all Bouwteam participants. All project related actions and deadlines of the client and the contractor, including who and what is needed to make decisions, need to be included in the planning.
  ➔ One Bouwteam participant should get the responsibility for keeping the planning and for holding the other participants to their promises.

× Participants are not open and honest about their actions.
  ➔ Room should be given for evaluation at every meeting in the form of an 'evaluation point on the agenda' to build up trust. In this way it is easier to discuss 'what went well and what can go better' and keep the setting open and honest.

× Late cost estimate and difficult price negotiations
  ➔ The price should be estimated parallel to the development of the design, starting in the early phase of the design phase. This gives the opportunity to see in an early stage of the design if the project will be feasible for the budget the client had in mind.
  ➔ A good preparations and clear agreements about the price will increase the chances of a smooth price negotiations phase.
  ➔ A price indication is needed for the tender to give the contractor an idea of the size of the project.

SQ5) What are success factors for the Bouwteam?

The success factors help to reach the benefits of a Bouwteam. They create a smooth process and overcome the obstacles of a Bouwteam. Recommendations gathered from the cross case analysis were presented, discussed and sharpened with Bouwteam experts, resulting in the following success factors:

- An open and honest tender document, which explains what the client wants, that focusses on the importance of collaboration, and includes a price indication.
- Correctly formulated selection criteria (with help of a third party).
- Equality in behaviour and duties for client and contractor.
- An elaborated PSU to discuss the collaboration, expectations, tasks, personalities, agreements (i.e. about the price) and how to maintain those agreements, in addition to discussing the project risks and scope.
- Making a joint planning together with all Bouwteam participants, including deadline, decision moments and who and what information is needed when.
- One Bouwteam participant is responsible for the Bouwteam process.
- Regular meetings, at least once every 2 weeks during the design phase.
- Working together in one location for part of a day every week, or every two weeks.
- Making the development of the Bouwteam negotiable by introducing a moment for evaluation in the meetings and using the RECAP assessment tool of Suprapto.
- Cost estimate is made parallel to the development of the design.

How can the benefits of the Bouwteam be achieved in construction projects?

By using the success factors of sub-question 5, it is possible to establish a collaborative relationship between the participants of the Bouwteam and stimulate the Bouwteam process, like price negotiations, to overcome the obstacles and achieve the benefits of a Bouwteam, as shown in figure 12.

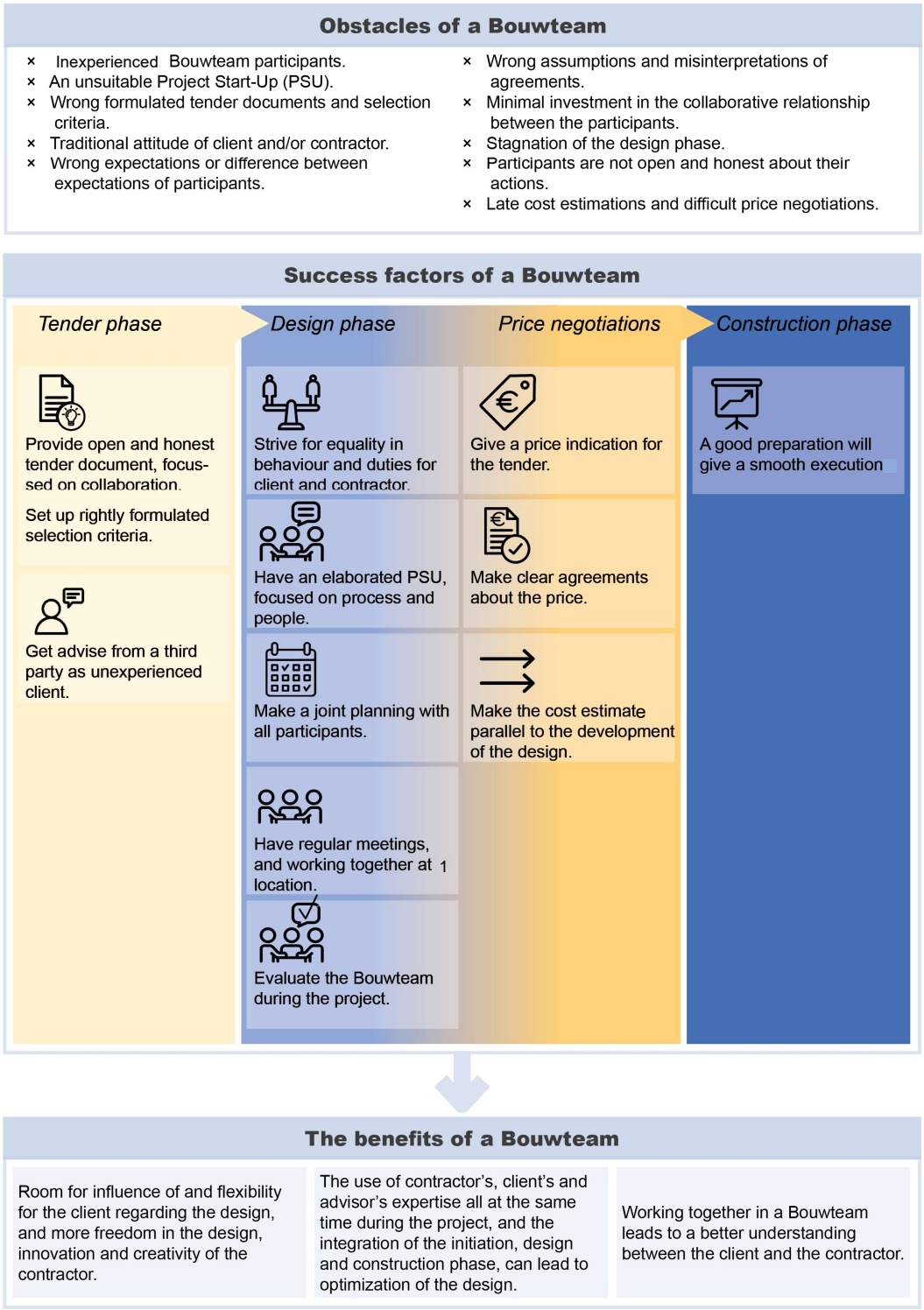

Figure 12; Conclusion of study, own illustration

8.2 Recommendations

Recommendations for practice

For Bouwteams in practice it is recommended to make sure to invest enough time in the collaborative relationship. This can be done by upscaling the already used measures. More importance could be given to the PSU and the participants should spend more time together by upscaling the meetings or even start working together for a part of the week on one location.

For a Bouwteam it can be helpful to use the success factors of sub-question 5. For the success factors to be used, it is important that the participants know the success factors exists. The client or a third (advising) party will have to introduce the success factors in the Bouwteam. The participants are more likely to accept the success factors when they know why they should use the success factors and how they will benefit from the success factors.

Specific recommendations for Antea Group are to use the success factors to supplement their vision. More specifically: adding an extra success factor about the importance of the right kind of PSU and the importance of meeting regularly to stimulate the collaboration and openness within the Bouwteam. The full implications for Antea Group's Bouwteam vision are given in section 8.3. If the success factors are integrated into the Antea Group Bouwteam vision, it is important that the Bouwteam vision will be actively used within Antea Group and during the Bouwteams in which they are involved.

Another recommendation for any collaborative relationship, is to use RECAP to find the possible points of improvement in the collaborative relationship and to make it easier to discuss the points.

Recommendations for further research

- ➔ Develop and test a more specific RECAP tool for Bouwteams, which can easily be used in practice without a lot of extra information needed. This can be very useful.
- ➔ Test if the success factors really make a Bouwteam project reach more of its benefits.
- ➔ Another interesting subject for more research could be the equality between the client and the contractor of the Bouwteam. It is often said that the client and contractor should work on equal terms and equality between the client and contractor is best for a good collaboration (Chao-Duivis, 2012; Koning, 2001). In practice, equality between the client and the contractor is never reached because the client will always have the end responsibility of a project and therefore the final decision. It is certain that a more equal relationship between the client and contractor is beneficial for a Bouwteam, in comparison to the traditional or integrated projects. However, the question remains if total equity is needed for the optimal Bouwteam results.
- ➔ The Integrated Project Management (IPM) way of working of Rijkswaterstaat might also work for a Bouwteam, especially with respect to working on a more equal basis within a Bouwteam. In one of the Bouwteam case studies they used the IPM method to organise their project team. This method is meant to stimulate equality and provides a logical and clear role/task division. In the Bouwteam Zeta this IPM method was used and both the client and contractor were positive about this way of working, the collaborative relationship between the client and contractor, and the results of the Bouwteam.

8.3 Implications for Antea Group's Bouwteam vision

The recently developed Bouwteam vision of Antea Group is compared to the findings of this study to optimize the vision. The success factors given in the vision are taken as a starting point and have been supplemented or adjusted when the results of this study show more or different success factors to reach the benefits of a Bouwteam. First an explanation is given of why and how the vision is optimized, followed by the new version in which the findings of this study are incorporated. Appendix G gives the original Bouwteam vision and exact changes made in Dutch.

Possible optimizations

The success factors mentioned in the vision are mostly conceptual, which makes sense because they are written down in a vision. However, to bridge the gap between theory and practice and make this vision reality, these success factors should be validated through tests in practice. The following recommendations are made to Antea Group based on the case studies from practice:

- ➔ Inexperienced Bouwteam participants need extra attention, preparations and guidance during the process.
- ➔ In addition to a clear task division it is very important to clarify the different expectations of the Bouwteam participants.
- ➔ The PSU is the beginning of a good collaborative relationship.
- ➔ It is essential to have a joint planning in which all tasks related to the Bouwteam are scheduled.

Additions and points of attention for the success factors named in the new Antea Group Bouwteam vision:

- ➔ 1. Customization: in every Bouwteam, the tasks and responsibilities are distributed differently amongst the Bouwteam participants and everyone has their own experience and expectations of Bouwteams. Therefore, it is very important to discuss what everyone is expecting from the other party, for example during the PSU.
- ➔ 3. Task distribution: Next to a clear task distribution, it is very important that the tasks are clear from the tendering phase to make sure that the potential contractors who apply for the job have the right expectations about the tasks they are signing up for. When a contractor is selected. Make sure to discuss the tasks and the expectations participants have about these tasks.
- ➔ 4. The Best partner: developing the right criteria for the selection of the contractor is not as easy as most think. It is common to procure a Bouwteam on quality instead of price, with the focus on collaboration. For this, there are no standardized selection criteria. It is certainly important to select a suitable partner, but this is just the beginning of the collaboration. A collaborative relationship does not automatically occur by signing the Bouwteam contract. It should not be forgotten that a collaborative relationship needs work from both sides, client and contractor.
- ➔ 6. Openness about price: openness about price is very important. It is crucial to stimulate this from the beginning of the design phase and estimate the price parallel to the design. Not only openness about price, but openness throughout the whole Bouwteam process is needed to come to a successful Bouwteam. For example, openness about expectations. It is essential the different expectations of the Bouwteam participants are clear and discussed with the whole team. The RECAP survey can be used to uncover differences and make them negotiable.

8.4 Antea Bouwteam vision 2.0

Considering the findings of this study, supplemented to Antea's Bouwteam vision, the newly adapted Bouwteam vision for Antea Group reads:

BOUWTEAM; COLLABORATION, OPEN COMMUNICATION & IN TIME ADJUSTMENTS

Bouwteam is back. Continuously more clients of construction projects see the benefits of a Bouwteam and procure their project as a Bouwteam. In many cases, the old Bouwteam contract model is used as basis for these projects. Are the benefits of a Bouwteam exploited optimally? Antea Group has developed an approach whereby the Bouwteam can satisfy the needs of today's world.

WHAT IS A BOUWTEAM?

A Bouwteam is a contract form in which the client, contractor, and in some cases engineering firm and architect, work together closely, to come to a design and agreement for the execution, that is supported by all parties.

Three phases are distinguished in a Bouwteam:

1. **Tender:** In the tender phase the client will search for the ideal partner for his Bouwteam.
2. **Design:** In the design phase, the client and contractor and / or architect and engineering firm work jointly to make a design for the project.
    - ➔ **Price negotiations:** The price negotiations are an important part of the design phase that runs parallel to the development of the design.
3. **Construction:** In the construction phase the project is physically realized.

WHY A BOUWTEAM?

There can be several benefits for which a Bouwteam is chosen. Three advantages stand out because they differ from other contract forms:

1. Using the knowledge of the party that will also execute the work, during the design phase.
2. Being able to influence the project during the design phase.
3. In line with the new '**marktvisie**': as a client, really collaborating with the contractor. Meaning for a Bouwteam: communicate openly about requirements, wishes and the distribution of risks, tasks and responsibilities.

WHAT ARE THE SUCCESS CONDITIONS?

All Bouwteams have one thing in common; collaboration is needed between client and contractor. Does a Bouwteam then guarantee a successful project? No, certainly not. To achieve a successful Bouwteam 10 success factors must be met.

1. **Customization.** Every project is unique and has its specific needs. Map these, record them and determine what you need to arrange within the Bouwteam agreement. Ensure it is communicated openly and honestly in the tender document.
2. **Task distribution.** Make a clear division of tasks. Clarify expectations in the Bouwteam agreement and discuss the task division to confirm all participants are on the same line.
3. **The best partner.** A Bouwteam requires a partner who wants to collaborate and can work together with the client. Setting the right selection criteria for selecting a suitable partner is very important. Make sure you have the right knowledge to set up a good tendering procedure.

4. **Collaboration.** Selecting the right partner is just the beginning. Starting and maintaining a good collaborative relationship is just as important. Meet regularly or work together at the same location, to build up trust between the participants.
5. **Project start-up.** Use a project start-up in which the participants get to know each other, and to kick-start the collaboration. Discuss expectations, define collaboration, make agreements and appoint someone who will hold all participants to these agreements.
6. **Traceability.** Record the decisions that are made. In a Bouwteam you have to make various decisions related to design and construction. Make decisions with care and record them to reduce the chances of wrong decisions or assumptions and clarify who was responsible for the decisions.
7. **Openness.** Encourage openness in price. During the design process, it will become more and more clear what the total price will be. Avoid surprises during the price negotiations and regularly discuss the costs of the design with each other, parallel to the design developments.
8. **Evaluation.** Stimulate openness in general. Openness about price, tasks, planning, feasibility, expectations, and ensure good as well as bad developments can always be discussed.
    - ➔ Use an evaluation point on the agenda of the meetings for regular evaluation.
    - ➔ Use the RECAP tool to expose differences of opinion about the collaboration and to make it open for discussion.
9. **Lead time.** For the Bouwteam to run smoothly, it is important everyone is up to date and knows when what is expected. Together with all Bouwteam participants, draw up a joint planning including all project-related actions, deadline and decision moments, so the required information and people are present at the right times.
10. **In control.** As a client, you have to final responsibility over the project. No one but you can better estimate what is needed to make this project a success.

When using these success factors you ensure clarity within the Bouwteam, an efficient approach and the ideal working environment for a successful result!

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Appendix

A. 1992 Bouwteam contract model

Bouwteamovereenkomst

De ondergetekenden:

a. .....

(opdrachtgever benoemen), hierna te noemen: *de opdrachtgever*;

en

b. .....

(aannemer benoemen), hierna te noemen: *de aannemer*;

overwegende:

1. dat de opdrachtgever voornemens is te realiseren:
   .....
   (omschrijving van het project), hierna te noemen: *het project*;
2. dat de opdrachtgever de voorbereiding van het project wenst te doen plaatsvinden in bouwteamverband;
3. dat de opdrachtgever daartoe aan daarvoor in aanmerking komende ondernemingen heeft verzocht om zitting te nemen in het bouwteam;
4. dat de aannemer bij de voorbereiding van het project door het bouwteam zijn specifieke ervaring en deskundigheid op het gebied van uitvoerings- en kostentechnische aspecten van het bouwen ter beschikking zal stellen, teneinde een optimale verhouding van prijs en kwaliteit van het project te bereiken;
5. dat de opdrachtgever voornemens is de uitvoering van de
   .....
   (aard van de werkzaamheden invullen, bijv.: bouwkundige werkzaamheden) die deel uitmaken van het project, hierna te noemen: het werk, op te dragen aan de aannemer, mits tevoren tussen opdrachtgever en aannemer over de prijs van het op te dragen werk overeenstemming wordt bereikt, een en ander met inachtneming van deze bouwteam overeenkomst;
6. dat de aannemer verklaart bereid en in staat te zijn een opdracht tot uitvoering van het werk te aanvaarden en naar behoren uit te voeren;

verklaren te zijn overeengekomen als volgt:

9 Doel van het bouwteam

Artikel 1

Het bouwteam is een samenwerkingsverband waarin de deelnemers - met behoud van ieders zelfstandigheid en verantwoordelijkheid - samenwerken aan de voorbereiding van het project. Voor dat doel is ieder der deelnemers gehouden zo goed mogelijk gebruik te maken van zijn specifieke ervaring en deskundigheid.

Samenstelling van het bouwteam

Artikel 2

Het bouwteam bestaat uit:

a. .....
b. .....
c. .....
d. .....
e. .....
f. .....

(alle deelnemers aangeven met vermelding van ieders discipline)

Artikel 3
De opdrachtgever is gerechtigd om, na overleg met de overige deelnemers, het bouwteam uit te breiden. Deze uitbreiding tast niet het in artikel 15 omschreven recht van de aannemer aan om als eerste en enige een prijsaanbieding voor het op te dragen werk te doen.

Taak van het bouwteam en van de opdrachtgever en de aannemer daarin
Artikel 4
Het bouwteam heeft als taak de voorbereiding van het project zodanig te doen verlopen dat dit resulteert in een voor de opdrachtgever aanvaardbaar ontwerp, neergelegd in een bestek met bijbehorende tekeningen. Als streefdatum voor de totstandkoming van het ontwerp geldt:
.....

Artikel 5
1. De opdrachtgever geeft leiding aan het bouwteam. Daartoe wordt onder meer gerekend:
- het tijdig kenbaar maken van wensen en verlangens ter zake van het project;
- het leiden van de vergaderingen van het bouwteam;
- het controleren en coördineren van de werkzaamheden van de afzonderlijke deelnemers;
- het beoordelen van in het bouwteam voorgestelde plannen, begrotingen en aanbiedingen;
- het tijdig nemen van alle beslissingen die noodzakelijk zijn voor de voortgang van het project.

2. De opdrachtgever kan zich in het bouwteam laten bijstaan of vertegenwoordigen door een deelnemer aan het bouwteam of door een derde. Degenen die namens de opdrachtgever zitting hebben in het bouwteam vertegenwoordigen hem in alle aangelegenheden die op het project betrekking hebben, tenzij uit deze overeenkomst anders blijkt of tenzij de opdrachtgever voldoende duidelijk van het tegendeel heeft doen blijken.

3. De opdrachtgever voert het overleg met overheidsinstanties terzake van de voor de opzet van het project benodigde goedkeuringen en vergunningen.

Artikel 6
1. De aannemer stelt aan het bouwteam zijn specifieke ervaring en deskundigheid op het gebied van de uitvoering van bouwwerken en de daaraan verbonden kosten ter beschikking, voor zover zulks in het kader van de voorbereiding van het project in redelijkheid wenselijk is teneinde te komen tot een voor de opdrachtgever aanvaardbaar ontwerp.

Daartoe wordt gerekend:
- het beoordelen van de uitvoerings- en kostentechnische aspecten van de in het bouwteam voorgestelde plannen en aanbiedingen, alsmede indien zinvol het voorstellen van een of meer alternatieven voor de in het bouwteam voorgestelde plannen en aanbiedingen;
- het verrichten van de werkzaamheden, zoals aangegeven op het als bijlage 1 aan deze overeenkomst gehechte overzicht van werkzaamheden.

2. De hiervoor gegeven omschrijving van de taken van de aannemer laat onverlet, dat partijen in een later stadium van de voorbereiding van het project kunnen overeenkomen dat de aannemer nader te omschrijven andere werkzaamheden zal uitvoeren.

Besluitvorming en verslaglegging
Artikel 7

De opdrachtgever is gerechtigd het bouwteam ter vergadering bijeen te roepen.

Artikel 8
De besluiten die in het bouwteam genomen worden, behoeven de goedkeuring van de opdrachtgever. Deze goedkeuring kan niet worden gegeven door de in artikel 5, tweede lid bedoelde vertegenwoordigers.

Artikel 9
Van alle bouwteam vergaderingen worden notulen gemaakt, welke in de eerstvolgende vergadering worden vastgesteld. Tenzij partijen anders overeenkomen is de aannemer belast met het opstellen van de notulen.

Artikel 10
Het bestek en de bijbehorende tekeningen op basis waarvan de aannemer zijn prijsaanbieding zal doen, dienen door de opdrachtgever te worden goedgekeurd. Deze goedkeuring kan niet worden gegeven door de in artikel 5, tweede lid bedoelde vertegenwoordigers.

Aansprakelijkheid van de aannemer en toepasselijke algemene voorwaarden
Artikel 11
De aannemer zal zijn werkzaamheden ten behoeve van het bouwteam naar beste weten en kunnen verrichten.

Artikel 12
De verantwoordelijkheid voor adviezen en ontwerpen ligt bij degene op wiens specifieke terrein in het bouwteam die adviezen en ontwerpen betrekking hebben, mits diegene die adviezen en ontwerpen heeft aanvaard en tot de zijne gemaakt.

Artikel 13
Indien en voorzover de aannemer ingevolge het vorige artikel verantwoordelijk is voor adviezen en ontwerpen, wordt zijn aansprakelijkheid daarvoor beheerst door de RVOI 1987, met dien verstande dat in plaats van het in art. 16, lid 4 RVOI 1987 genoemde bedrag aan advieskosten, een vast bedrag geldt van .....(door partijen zelf in te vullen).

Artikel 14
Indien ten vervolge van deze overeenkomst door partijen een aannemingsovereenkomst wordt gesloten voor de uitvoering van het werk, zullen daarop de UAV 1989 van toepassing zijn, voorzover in het bestek niet anders wordt bepaald en met inachtneming van de in de artikelen 12 en 13 neergelegde verdeling van verantwoordelijkheden.

Prijsvorming
Artikel 15
De aannemer is gerechtigd om als eerste en enige een prijsaanbieding te doen voor het op te dragen werk, zoals omschreven in het door de opdrachtgever goedgekeurde bestek en de bijbehorende tekeningen.

Artikel 16
De aannemer doet zijn prijsaanbieding door het indienen van een open begroting. Deze begroting zal door de opdrachtgever vertrouwelijk worden behandeld en aan de aannemer onverwijld worden teruggestuurd ingeval geen aannemingsovereenkomst tot stand komt.

Artikel 17

1. De wijze waarop de begroting zal zijn ingericht, is in de bij deze overeenkomst behorende bijlage 2 vastgelegd.

2. In de begroting wordt een opslag van ..... (percentage invullen)% gehanteerd voor algemene kosten, te berekenen over het totaal van ..... (door partijen zelf in te vullen).

   In deze opslag zijn de volgende kosten begrepen:
   a. .....
   b. .....
   c. .....(door partijen nader in te vullen)

3. Voor winst en risico wordt een opslag van .. % (percentage invullen) gehanteerd, te berekenen over het totaal van
   ..... (door partijen nader in te vullen).

   In deze opslag zijn de volgende kosten begrepen:
   a. .....
   b. .....
   c. ..... (door partijen nader in te vullen)

Prijsoverleg en gunning van de opdracht

Artikel 18

1. De opdrachtgever en de aannemer voeren overleg over de door de aannemer gedane prijsaanbieding, teneinde tot overeenstemming te komen over de aanneemsom. Gedurende deze onderhandelingen zullen partijen rekening houden met de gerechtvaardigde belangen van de wederpartij.
2. De opdrachtgever zal zich gedurende de looptijd van deze overeenkomst onthouden van contact met andere aannemers over het op te dragen werk.

Artikel 19

1. Indien partijen na onderhandeling over de prijsaanbieding van de aannemer geen overeenstemming bereiken over de aanneemsom, zullen zij - uitsluitend ten aanzien van het onderdeel of de onderdelen van de prijsaanbieding waarover verschil van inzicht bestaat - advies vragen volgens de hierna aangegeven procedure.

2. Partijen vragen advies aan een gezamenlijk te benoemen kostendeskundige. De benoeming dient plaats te vinden binnen veertien dagen nadat één der partijen schriftelijk heeft verklaard het overleg over voornoemde prijsaanbieding als beëindigd te beschouwen. De deskundige brengt zijn advies uit binnen vier weken nadat hij is benoemd.

3. Indien partijen het niet eens kunnen worden over de gezamenlijke benoeming van een kostendeskundige, zullen zij advies vragen aan een commissie van drie deskundigen, waarvan elk der partijen één deskundige zal aanwijzen binnen veertien dagen nadat vaststaat dat partijen het niet eens kunnen worden over de gezamenlijke benoeming van een kostendeskundige. De derde deskundige zal door beide voornoemde deskundigen worden aangewezen binnen veertien dagen nadat zij zijn benoemd. De deskundigen brengen hun advies uit binnen vier weken nadat de derde deskundige is benoemd.

4. Mocht één der partijen in gebreke blijven een deskundige aan te wijzen binnen de in het vorige lid omschreven termijn, dan brengt de door de andere partij aangewezen deskundige zelfstandig een advies uit.

5. Bij een advies dat resulteert in een prijs voor het gehele werk hoger dan .....% van de door de aannemer gedane prijsaanbieding en niet hoger dan die prijsaanbieding, zijn partijen gehouden het advies te volgen.

Artikel 20
Indien partijen in redelijkheid niet tot overeenstemming over de aanneemsom kunnen komen en de in artikel 19 omschreven procedure niet tot een oplossing leidt, is de opdrachtgever vrij derden uit te nodigen tot het doen van een prijsaanbieding voor het werk, met de indieners van deze prijsaanbiedingen in onderhandeling te treden en de opdracht ter uitvoering van het werk aan een of meer van deze derden te gunnen. In dat geval zal de aannemer de opdrachtgever op geen enkele wijze belemmeren in zijn streven om met een derde tot overeenstemming te komen over de uitvoering van het werk.

Artikel 21
Doordat partijen overeenstemming bereiken over de aanneemsom of de aanneemsom naar aanleiding van de in artikel 19 omschreven procedure tussen partijen is komen vast te staan, komt de aannemingsovereenkomst tot stand. De aannemingsovereenkomst zal door partijen nader schriftelijk worden vastgelegd.

Beëindiging van de overeenkomst
Artikel 22
1. Deze overeenkomst eindigt, zonder dat rechterlijke of arbitrale tussenkomst vereist is, indien:
   a. partijen niet tot overeenstemming over de aanneemsom komen en de in artikel 19 omschreven procedure niet tot een oplossing leidt;
   b. de opdrachtgever er niet in slaagt om tijdig de volgende voor het project benodigde overheidsgoedkeuringen en -vergunningen te verkrijgen:
   .....
   (door partijen zelf in te vullen);
   c.....
   d.....
   e.....
   (door partijen in te vullen ontbindende voorwaarden)

2. Vóór de totstandkoming van de aannemingsovereenkomst kan deze overeenkomst tevens door ieder der partijen worden beëindigd door een tot de wederpartij gerichte schriftelijke verklaring, indien de wederpartij surséance van betaling aanvraagt of failliet wordt verklaard.

Artikel 23
1. Indien deze overeenkomst niet tot een aannemingsovereenkomst leidt, zal door de opdrachtgever .....
   (door partijen in te vullen bedrag of percentage van de prijsaanbieding)
   aan de aannemer betaald worden, bij wijze van vergoeding voor verrichte werkzaamheden. Het hiervoor bedoelde bedrag zal niet verschuldigd zijn indien het aan de aannemer is toe te rekenen dat er geen aannemings- overeenkomst tot stand is gekomen.

2. Tegen betaling van het in het eerste lid bedoelde bedrag is de opdrachtgever vrij voor eigen risico de door de aannemer in het bouwteam ontwikkelde en in het bouwteam ingebrachte tekeningen, berekeningen en overige kennis naar eigen goeddunken te gebruiken.

Geschillen

Artikel 24

Alle geschillen - daaronder begrepen die, welke slechts door een der partijen als zodanig worden beschouwd - welke naar aanleiding van deze overeenkomst tussen opdrachtgever en aannemer ontstaan, zullen worden beslecht overeenkomstig de regelen beschreven in de statuten van de Raad van Arbitrage voor de Bouwbedrijven in Nederland, zoals deze drie maanden voor de dag van sluiting van deze overeenkomst luiden.

B. Extensive list of benefits

Minimizes fragmentation of the whole construction process (Nielen, 2010)(Doree, 2001)(PIANOo et al., 2017). This will lead to:

- This will minimize failure cost (faalkosten)(Chao-Duivis, 2012), Bouwkennis BV,
- Better risk assessment and risk allocation (van Wijck, 2018)

The contractor is early involved to contribute to the design, together with the client. This will lead to:

- Flexibility. A client is able to steer the design and change his requirements (to a certain extent) without having to face contractual negotiations (Nielen, 2010) (Mosey, 2009)
- Optimisations of the design (Boijens, 2008)(Molier, 1999).
- Use of contractor's expertise during the project (Scheepbouwer & Humphries, 2011) (PIANOo et al., 2017)
- Use of client's expertise during the project (PIANOo et al., 2017)
- Input of specialist knowledge from various advisers (Boijens, 2008)
- Bouwteam results in better constructability of the project (van Wijck, 2018) (Rahman & Alhassan, 2012)
- Minimizing problems during the construction(Boijens, 2008)
- Better project quality (van Wijck, 2018) (Rahman & Alhassan, 2012)
- Better budget control through involvement of construction and cost expert involvement during design phase and more realistic estimation of cost. (Boijens, 2008) (SBR, 2006) (Rahman & Alhassan, 2012) (van Wijck, 2018)
- No information transfer needed from client to contractor between the design and execution phase(Boijens, 2008).
- Obtaining the most optimal price / quality ratio (Boijens, 2008)
- Possibilities for better embedding of the project in the environment (van Wijck, 2018)
- Fewer lawsuits and reduced disputes (in comparison to integrated contracts) (Rahman & Alhassan, 2012)(Chao-Duivis, 2012; Kamminga, 2011)
- There is more freedom in design for innovation or for the creativity of the contractor (van Wijck, 2018) (Rahman & Alhassan, 2012)
- Higher process quality (van Wijck, 2018) (Hardeman et al., 2014)
- Increased understanding between the different Bouwteam parties (Rahman & Alhassan, 2012)
- Higher satisfaction for all parties (Rahman & Alhassan, 2012)
- Better alignment of goals between the parties(Scheepbouwer & Humphries, 2011)
- More trust between the parties (Scheepbouwer & Humphries, 2011)
- Greater partnership between the parties (result of the two above) (Scheepbouwer & Humphries, 2011)
- Better compliance with agreements between the parties involved (Hardeman et al., 2014)

Designing can take place parallel to finding the right construction method and make building preparations (Boijens, 2008). This will lead to:

- Time profit (Boijens, 2008) (SBR, 2006) (van Wijck, 2018)
- Better risk assessment and risk allocation (van Wijck, 2018)
- Better risk management (Rahman & Alhassan, 2012)
- Better risk distribution (van Wijck, 2018) (Scheepbouwer & Humphries, 2011)
- More realistic planning and delivery on time (van Wijck, 2018) (Scheepbouwer & Humphries, 2011) (Hardeman et al., 2014)
- The contractor is well prepared when starting the construction phase.
- Less surprises during the construction phase, though directly addressing and solving problems (Boijens, 2008).
- Early insight into construction costs (Boijens, 2008)

C. Interview question

A) Algemene vragen		
Vraag	1	Wat is volgens u een bouwteam?
Vraag	2	Wat is uw ervaring met bouwteams?
Vraag	3	Hoe heeft het bouwteam zich volgens u ontwikkeld in de laatste 20 jaar?
Vraag	4	Wordt het bouwteam meer gebruikt de laatste jaren?
Vraag	5	Welke redenen heeft dit volgens u?
Vraag	6	Wat zijn redenen om niet in een bouwteam te willen werken?
B) Project speciefieke vragen		
Vraag	1	Kunt u een korte beschrijving geven van uw meest recente bouwteam/specifieke project?
Vraag	2	Wat zijn uw belangen in dit bouwteam?
Vraag	3	Kunt u de belangen van de ander bouwteamleden beschrijven (OG/ON)?
Vraag	4	Wie heeft de leiding over het bouwteam?
Vraag	5	Heeft u ook in ander bouwteams gewerkt, welke aspecten waren hier in anders?
C) Aanbestedingsfase vragen		
Aanbestedingsfase wel/niet van toepassing		
Vraag	1	OG; Wat was de reden om een bouwteam te kiezen voor dit specifieke project?
Vraag	2	Wat is volgens u essentieel om een bouwteam goed aan te kunnen besteden?
Vraag	3	OG; Hoe ben u tot selectie gekomen van de aannemer?
Vraag	4	Hoe verliep de aanbestedingsprocedure? (Onderhands? Meervoudig onderhands? Europees?)
Vraag	5	Wat waren de selectie criteria? (Prijs?)
Vraag	6	Heeft de manier van aanbesteedden invloed gehad op de ontwerpfase?
Vraag	7	Bent u tevreden over de manier van aanbesteden?
D) Ontwerpfase vragen		
Ontwerpfase wel/niet van toepassing		
Vraag	1	Wat ziet u als succesfactoren in de ontwerpfase voor een goedwerkend bouwteam?
		kunt u een voorbeeld geven?
Vraag	2	Wat zijn obstakels in de ontwerpfase die een goedwerkend bouwteam tegenwerken?
Vraag	3	Wat is de meerwaarde van het werken in een bouwteam/ als zeer positief ervaren?
Vraag	4	Wat heeft u als negatieve aspecten ervaren van het bouwteam?
Vraag	5	Hoe belangrijk acht u de samenwerking?
		Heeft u voorbeelden van aspecten die de samenwerking vermoeilijken?
Vraag	6	Hoe vaak komt u samen met het bouwteam voor overleg?
Vraag	7	OG; Hoe zou u de verhouding met de opdrachtnemer/aannemer willen beschrijven in de ontwerpfase?
Vraag	9	Bent u tevreden over het werk van de ander partijen in het bouwteam?
Vraag	10	Hoe zijn de verantwoordelijkheden binnen het bouwteam verdeeld?
Vraag	11	Hoe wordt er omgegaan met risicomanagement in bouwteam?
		Heeft u het idee dat de risico's op een eerlijke manier verdeeld zijn?
Vraag	12	Heeft u aan het begin van de ontwerpfase een 'team start up' gehad?
E) Prijsonderhandlingsfase vragen		
Prijsonderhandelingsfase wel/niet van toepassing		
Vraag	1	Hoe komt de prijs tot stand in dit bouwteam?
Vraag	2	OG; Hoe kan het voorkomen worden dat de prijs een verrassing is?
Vraag	3	Was er spraken van een open begroting?
Vraag	4	Bent u tevreden over de prijs-kwaliteitsverhouding?
F) Uitvoeringsfase vragen		
Uitvoeringsfase wel/niet van toepassing		
Vraag	1	Bent u tevreden over het ontwerp en over hoe het programma van eisen is vertaald naar het ontwerp?
Vraag	2	Loopt volgens u het bouwteam door in tot en met de uitvoeringsfase?
Vraag	3	Wat is de meerwaarde van het werken in een bouwteam voor de uitvoeringsfase?
		Kunt u een voorbeeld geven?
Vraag	4	Bent u binnen de planning gebleven?
Vraag	5	Bent u binnen het budget gebleven?
G) Afsluitende vragen		
Vraag	1	Bent u tevreden over het bouwteam zo ver?
Vraag	2	Zou u in de toekomst vaker in een bouwteam willen werken?
Vraag	3	Wat is uw grootste leerervaring geweest in dit bouwteam?
Vraag	4	Wilt u nog wat toevoegen aan uw eerder gegeven antwoorden?

D. Adapted RECAP survey

Vragenlijst samenwerkingsverschillen

Deze vragenlijst is gebaseerd op het proefschrift van M. Suprapto van de TU Delft. Hierin heeft hij een vragenlijst opgesteld waarmee hij de kwaliteit van de samenwerking onderzoekt aan de hand van de scores, gebaseerd op stellingen, en de verschillen tussen de ingevulde lijst van de opdrachtgever en de lijst van de opdrachtnemer. Het scoren en het benoemen van de verschillen kan aanleiding geven tot het bespreken van de samenwerking binnen het bouwteam en daarmee het verbeteren van deze samenwerking. Een betere samenwerking heeft namelijk een positief effect op het succes van het project.

Hoe in te vullen:

Hier beneden vindt u verschillende stellingen. Door de stelling te scoren van 1 tot 5 geeft u aan in hoeverre u het eens bent met de stelling (binnen het bepaalde bouwteam project).
1 = sterk mee oneens, **2** = mee oneens, **3** = neutraal, **4** = mee eens, **5** = sterk mee eens, (**-**) = niet van toepassing.

1. Oriëntatie	1	2	3	4	5		-
a) De projectdoelen, doelstellingen en scope worden goed begrepen door de opdrachtnemer.							
b) De projectdoelen, doelstellingen en scope worden begrepen door de opdrachtgever.							
c) Alle functionele en technische eisen (PvE) zijn door de verschillende partijen samen binnen het bouwteam doorgenomen en besproken.							
d) Het projectuitvoeringsplan wordt door de verschillende partijen samen doorgenomen en indien nodig aangepast.							
e) Er zijn duidelijke rollen en verantwoordelijkheden toegewezen aan de verschillende partijen.							
2. Team integratie	1	2	3	4	5		-
a) Het bouwteam vormt een geïntegreerd projectteam waarin de opdrachtgever en de opdrachtnemer zijn vormgegeven als één team en geïntegreerd samen werken.							
b) Het bouwteam investeert in teambuilding (doormiddel van workshops) om de samenwerking te stimuleren.							
c) Er is binnen het project een erkennings- en beloningsprogramma om collaboratief gedrag te stimuleren.							
3. Gezamenlijke werkprocessen	1	2	3	4	5		-
a) De planning wordt gezamenlijk opgesteld.							
b) Het bouwteam identificeert en monitort gezamenlijk de risico's en formuleert een beheersplan.							
c) Er zijn methodes om conflicten en/of geschillen op te lossen.							
d) Er zijn formele procedures voor gezamenlijke besluitvorming.							

4. Efficiëntie	1	2	3	4	5		-
a) Het project vordert tot nu toe in overeenstemming met de geschatte kosten.							
b) Het project verloopt tot nu toe volgens het geplande schema.							
5. Kwaliteit	1	2	3	4	5		-

a) Tot nu toe is er geen significante hoeveelheid meerwerk.							
b) Tot nu toe voldoet het project aan de gestelde kwaliteit.							
6. Tevredenheid	1	2	3	4	5		-
a) Zowel de opdrachtgever als de opdrachtnemer zijn tevreden met de projectresultaten en resultaten tot nu toe.							

7. Relatiecontinuïteit	1	2	3	4	5		-
a) De samenwerking binnen dit project levert voordelen op voor beide partijen.							
b) De samenwerking stelt beide partijen in staat unieke capaciteiten te ontwikkelen (echt innovatieve producten en/of oplossingen)							

10. Relationele normen	1	2	3	4	5		-
a) De opdrachtgever neemt opzettelijk een ‘no-blame cultuur’ aan als zich problemen voordoen.							
b) De opdrachtnemer neemt opzettelijk een ‘no-blame cultuur’ aan als zich problemen voordoen.							
c) De opdrachtgever is open en eerlijk in zijn interacties met de opdrachtnemer, zonder verborgen agenda's.							
d) De opdrachtnemer is open en eerlijk zijn interacties met de opdrachtgever, zonder verborgen agenda's.							
e) De opdrachtgever streeft naar zakelijke uitkomsten waarbij beide partijen winnen of beide partijen verliezen.							
f) De opdrachtnemer streeft naar zakelijke uitkomsten waarbij beide partijen winnen of beide partijen verliezen.							
g) Beide partijen zijn het er mee eens dat ze een gelijke stem hebben in de belangrijke beslissingen die voor beide partijen van belang zijn.							

11. Communicatie	1	2	3	4	5		-
a) Beide partijen communiceren rechtstreeks met elkaar.							
b) Projectrelevante informatie wordt door beide partijen open en eerlijk gedeeld.							
c) Wanneer een probleem wordt ontdekt, wordt het op tijd eerlijk gecommuniceerd naar de rest van het bouwteam.							
d) Beide partijen zijn tevreden met het nut van de informatie dat door een andere partij wordt gedeeld.							
12. Coördinatie	1	2	3	4	5		-
a) Het werk van beide partijen is nauw gesynchroniseerd.							
b) Er is een duidelijke koppeling tussen de onderlinge afhankelijke taken.							
13. Evenwichtige bijdrage	1	2	3	4	5		-
a) Beide partijen erkennen de sterke en zwakke punten van de andere partij.							
b) Beide partijen dragen bij aan het bouwteam met hun kennis en/of expertise, en zetten deze voldoende in.							
c) Er is een evenwichtige bijdrage met betrekking tot nieuwe ideeën van de verschillende partijen.							

14. Wederzijdse ondersteuning	1	2	3	4	5		-
a) Beide partijen helpen elkaar zo goed als ze kunnen.							
b) Wanneer zich problemen voordoen, worden deze constructief opgelost.							
c) Belangrijke beslissingen worden door de partijen gezamenlijk genomen.							
15. Gelijk georiënteerde inspanning	1	2	3	4	5		-
a) Beide partijen geven dit project de prioriteit die het nodig heeft.							
b) Beide partijen spannen zich maximaal in voor dit project.							
c) Er is geen onenigheid over de inspanningen die elke partij in dit project heeft geleverd.							
16. Cohesie	1	2	3	4	5		-
a) Leden van het bouwteam zijn persoonlijk betrokken bij dit project.							
b) Leden van beide partijen zijn als één team geïntegreerd							
c) Leden van beide partijen voelen zich verantwoordelijk voor het behoud van de relaties binnen het bouwteam.							
17. Onderling vertrouwen	1	2	3	4	5		-
a) Beide partijen voelen zich prettig met het afhankelijk zijn van elkaar.							
b) Beide partijen houden zich aan hun beloften.							
c) Beide partijen werken met een hoge mate van integriteit.							
d) Beide partijen zijn eerlijk tegenover elkaar.							
e) Beide partijen kijken om naar elkaars belangen.							
f) Beide partijen kunnen op elkaar vertrouwen.							

Adaptations of Suprapto's RECAP

Statements were left out when they were too specific and/or lay outside the scope of this study. Due to the limited time frame of the interviews, several statements were merge of left of when other statements already implied what was asked in this statement.
The adapted RECAP is still useful in this adapted way because the relevant subject for the collaborative relationship between the client and the contractor of a Bouwteam are still represented in the statements.

- A.1. only translated
- A.2.
  - f. regarding the term IPT is change to a more general term in Dutch. *Geïntegreerd project team* instead of IPT term is used.
  - g. and h. are left out: beyond the scope of the study, because it does not focus on one of the three main roles described in the sections 1.4 of the report.
  - i. & j. only translated
- A.3.
  - l. m. n. were left out, because they are not applicable on Bouwteams. They discuss joint activities which are executed by one individual in a Bouwteam.
  - k. o. p. q. only translated to Dutch.
- B.4. only translated
- B.5.

    - c. only translated
    - d. e. f. are combined in to one statement because they were too specific about safety and execution which are outside the scope of this study.
- B.6.
    - g. only translated
    - h. & i. are left out because g. already imply h. and i. and it was tried to make the survey as short as possible due to time limit of the interviews.
- B.7.
    - j. & k. are left out because the focus on future projects together, which is not relevant for a Bouwteam and its procurement method.
    - l. m. only translated.
- C.8 regarding senior management commitment is left out completely. Because the cases used in this study are small and are not supervised by the senior management of the company's.
- C.9. is left out completely because of the same argument as for C.8.
- C.10. only translated
- D.11. only translated
- D.12.
    - e. f. only translated
    - g. was left out because it had overlap with e. and f.
- D.13. only translated
- D.14. only translated
- D.15. only translated
- D.16.
    - q. r. t. only translated
    - s. is left out because it is not relevant for a Bouwteam.
- D.17. only translated.

E. Extensive Bouwteam cases descriptions

Bouwteam Alpha

Bouwteam Alpha	
Project status at time of research	The design phase, first cost estimate has been made by the contractor, but not yet discussed.
Desk Study	
Desk study	• Request for tender documents (Inschrijvingsleidraad) • Project planning • Form internal start meeting (client and Antea Group) • PowerPoint Presentation Bouwteam Alpha • Descriptive document Bouwteam Alpha, Invitation to register. • Cost estimate before tendering
	Written in the document 'internal start meeting', the client state that they would like to construct this project in the form of a bouwteam, because they have good experience with Bouwteams, referring to the Bouwteam Gamma, discussed on page 36. It is remarkable that the project manager of Bouwteam Gamma stated that this particular project was not suitable to execute with a Bouwteam.
Kind of project	Road reconstruction along a busy route.
Budget	€ 1,550,000,- excl. VAT
Tender procedure	Selective tendering
EMVI (Economisch Meest Voordelige Inschrijving)	A maximum project budget for the entire process in which the contractor is involved, set by the client. Plan of Action including four risks and their control measures was asked from the potential contractors. The Plan of Actions was assessed on: the realism of the risk and how well the risk would be controlled by the potential contractor.
Construction contract	The design phase is concluded with construction specifications (Bestek) and the drawings. The construction contract is in the form of an UAV model.
Meeting frequency	One daypart every week during the design phase. One every two weeks they work together at one location.
Project start-up (PSU)	The PSU was very elaborate, with compiling and discussing each other's personal profiles. There will be a follow-up.
Planning	They are still running according to schedule.
Costs	It seems the project will cost more than the estimated budget. This was already concluded by the tender presentations and accepted by both the client and the contractor.
Team composition	Client and contractor, both with their own advisors. The contractor has designers, cost expert and a project leader /contractor. The client has a project leader, project coordinator and a project supervisor. The meetings are at the office of the client and the contractor brings the different needed advisors with him depending on the subject of the meeting.
Client company	The clients company is a middle big municipality in the middle of the Netherlands Within the municipality there is little experience with Bouwteams. Bouwteam Gamma was their first Bouwteam in many years. Bouwteam Alpha is their second in a long team.
Contractors company	The contractors company is a well-known part of one of the biggest construction companies in the Netherlands. They are specialized in road construction, industrial estates and industry,

	hydraulic engineering, management, maintenance, advice and design.
Leading party	The contractor has been given the lead in this Bouwteam put down in the Bouwteam agreement.
Contractor involved from	The initiative phase, before the design phase.

Project description Alpha
Bouwteam Alpha is a reconstruction of a part of a road including sewerage. Along this street there are several companies which had to stay accessible during the execution of the project. It is the complex phasing of construction in particular, which made the client choose for a Bouwteam. The Bouwteam is set out to complete the design phase and the construction phase with the same contractor.

Antea Group was involved in this Bouwteam to help the client set up the tender. The tender documents are made by Antea Group with input from the client, for example the request for tender document (Inschrijvingsleidraad), assessment criteria (EMVI criteria), the Bouwteam agreement and appendices.

Tender phase
The tender procedure was a selective tendering with a maximum project budget of € 1,550,000, excluding VAT. The costs of the design phase are included in this budget. The contractors who were invited to tender for this Bouwteam were asked to submit a Plan of Action (Plan van Aanpak). Three potential contractors present their Plan of Action including four risks and control measures. The Bouwteam was awarded on the basis of the award criterion "Best Price-Quality Ratio", whereby the assessment was 100% on quality. The client and Antea Group assessed the presented Plan of Actions on: the realism of the risk and how well the risk would be controlled by the potential contractor. Next to the Plan of Action, interviews were conducted with the project manager of the potential contractors. The interviews were assessed on: fitness and suitability for this Bouwteam, by looking at the qualities of the project manager like management skills and technical knowledge. But also, experience with Bouwteams and the level of commitment to the project.

Design Phase
After the tendering the Bouwteam started with a project start-up, to introduce the project and to get to know the people involved. The design phase is scheduled for 11 weeks and was completed in this set time span. Client and contractor were both actively involved in this phase, just as advisors from within their own companies. Antea Group was not involved in this phase any more. During this phase the participants of the Bouwteam came together to work on the project for one daypart a week.
The design phase will be concluded with the draft of the construction contract, in the form of construction specifications (Bestek) and the drawings. The contract is in the form of an UAV.

Price negotiation phase
At the time of this research, price negotiations were supposed to be finished. Based on an open budget, the client and contractor would discuss the prices for the construction and find the solution for this project with the suitable price-quality ratio. The final cost estimate of the contractor will be tested by a third party. When they come to an agreement on the price, the construction job will be officially procured to the contractor. This way of procuring can be seen as a negotiable tendering, in which only one contractor is asked to do a bid. There are contract dissolving conditions in case the client and the contractor cannot reach an agreement. If this is the case, the contractor will receive a compensation for the design phase.

Construction phase
The total construction is planned to be finished within six months but did not yet start at the time of this study.

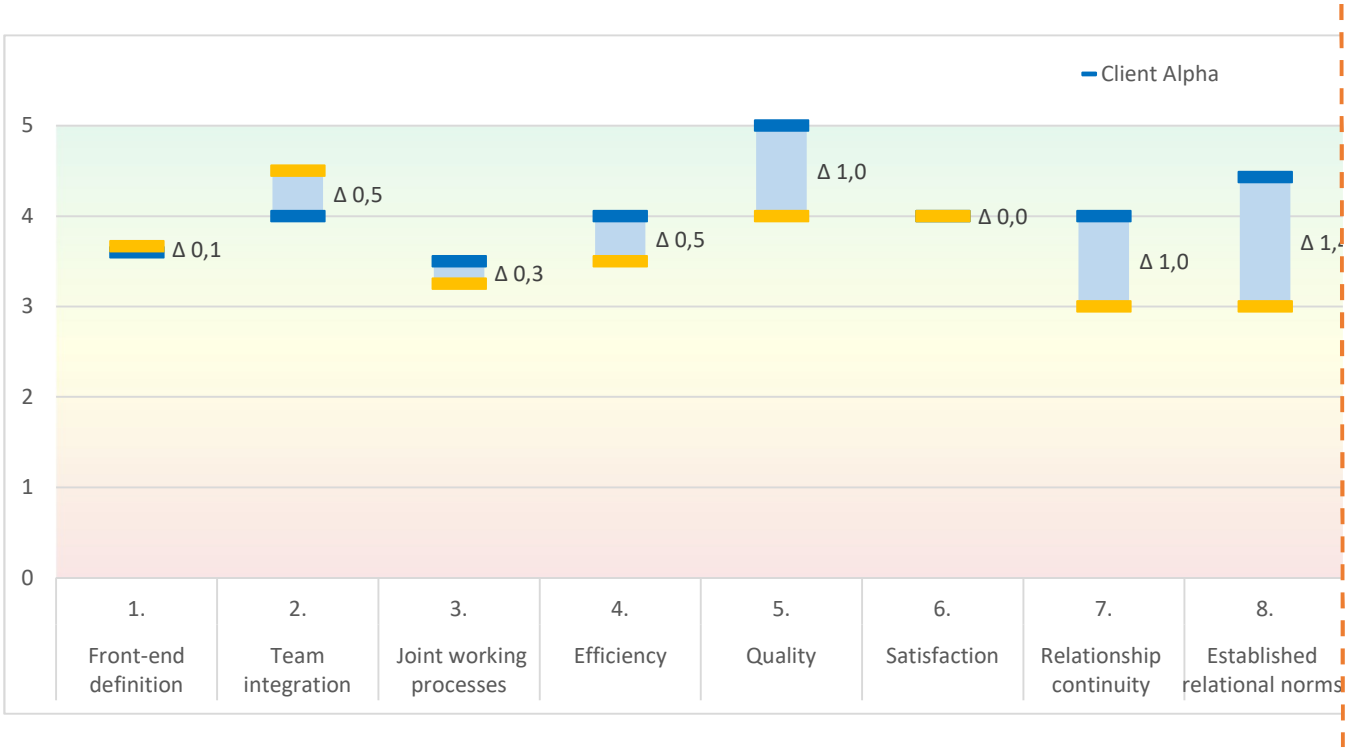
Observation
Observation could been done during the contractor selection meeting. The clients project manager, and 2 other participants together with an Antea Group advisor were present during this meeting to assess the presentations and interviews. In the morning the potential contractor would one by one present their Plan of Action and the risks and in the afternoon the potential contractor returned for an interview. After each presentation the assessment committee would score the presentation by each giving a score between the 1 and 3. During the assessment the Antea Group advisor had to explain (a few times) how the exactly asses the presentations. One potential contractor had scored better than the other two, although there was some discussion because one of the assessors had good experience with one of the other potential contractors, but it is not allowed to weigh former experience in such a tender assessment. The contractor to win the tender was open and presented himself as a person with whom the client wants to collaborative. He showed to be honest and open by already telling the client that the budget of the project was too low. By coming up with a solution for this, he convinced the client that he can think outside the box and willing to look for optimizations.

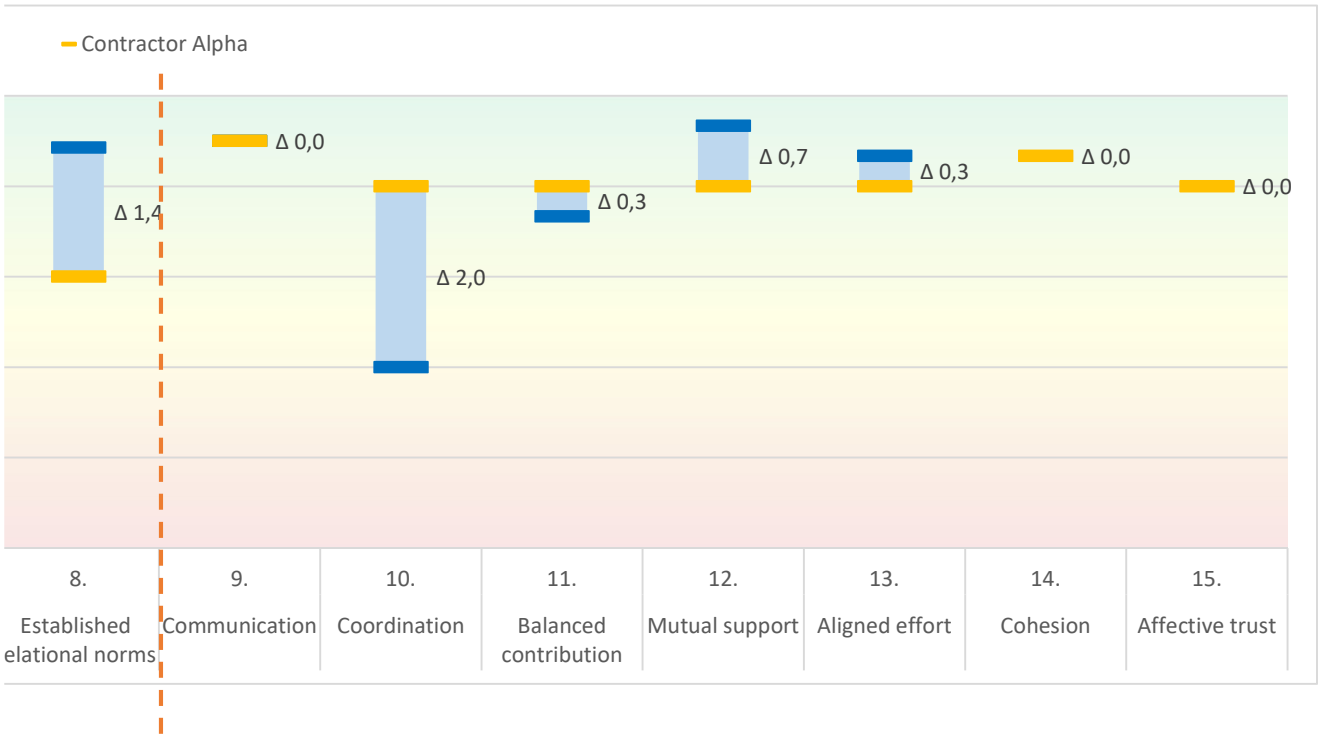
Interviews	
Interviews were conducted with the client and the contractor of this Bouwteam, separately. The project leader of the client's company had no experience in working with a Bouwteam. The client mentioned that it had cost some effort to convince the municipality to choose for a Bouwteam. The other interviewee was the project leader of the contractors company. Also he had no experience in working with Bouwteams. Through this project, the contractors company likes to be able to gain experience in working with this municipality and make a good first impression and gain experience with Bouwteams.	
Client	Contractor
What is a Bouwteam? (C1,2,3)	
Client:' *a collaboration between two or more parties, who want to construct something together*'. They work side by side, making use of each other's knowledge and expertise, especially the knowledge of a contractor. You are sitting around the same table.	A project in which the client and contractor work together based on trust to make a better project for the client. In a Bouwteam they focus on the collaboration and are able to use each other's expertise to optimize the design and the construction.
Why a Bouwteam? (C1,2,3)	
The client told '*the complexity of the execution of the project'* was the reason to choose for a Bouwteam. They did not want to put this complexity away till it would be the contractor's problem, but tackle it together during the preparations of the project.	(-)
Benefits (D3)	
The added value for a project, using a Bouwteam, is that you are sitting around the table together, client: '*you almost never to this in other projects*'. The biggest benefit is the collaboration.	Up till now we do not see a lot of benefits, the project is not very complex and not suitable for very innovative solutions which need to be created through collaboration between different expertise. For the contractor it is instructive to work close together with the client to get insight in how they are tackling those kind of projects.

	And because of the collaboration it is possible to better understand way decisions are made.
Success factors (D1)	
1) The contractor needs to agree with the way of working of a Bouwteam. 2) The on time involvement of the stakeholders. 3) Bottlenecks must uncovered as early as possible. Unclear scope, requirements or specifics need to become clear as soon as possible. 4) Client during interview: 'Meeting regularly creates an urgency to keep up with your work and meet the deadlines'.	1) A good analysis. 2) A planning in which the project is divided in boxes and at the end of the box it is decided what should be finished. 3) And make sure to work structured. But the Bouwteam gives space to come together and collaborate more than during traditional projects.
Obstacles (A6)	
1) A big obstacle can be when the involved participants have not enough time. 2) When participants are passive and are waiting for the other participants to make the plans and decisions. 3) When the personality's with in the team are not able to collaborate well.	1) Incomplete information and the lack of overview of what aspects you should be taken in to account for making the right design. 2) The contractor is afraid the collaborative relationship might be disturbed because of the official separation of the Bouwteam contract and the construction contract.
Leading party (B4)	
As written down in the contract, the contractor is in the lead. The client experiences this in a positive way. Client: 'it *works well, the contractor is going a fine job, and I am glad I can leave it to him'*.	Contractor: '*we as the contractor are in the lead, but there is equality between the participants*'. The contractor has the feeling it goes pretty well and they have a fun team. In the beginning the contractor felt like the client was behaving too traditional, and was waiting for the contractor to take action. As the project continued the client became more involved and started to give more input.
Tender phase (E)	
The client was very satisfied with the tender procedure and the outcome of it. As he said: 'I *wouldn't change a thing*'. The presentations and the interviews gave the client a good impression if the contractor understood the job. According to the client, the way of tendering gave to possibility to see if the potential contractor can be a partner who you can trust. <u>It is very important that beforehand the goals of the project are clear. And it is important that there is a clear description of wat the different participants can expect from each other.</u> The maximum project budget that was set for the tendering was a little lower than the cost estimate, which explained that all bids of three different contractors were higher than the maximum project budget.	Contractor stated: for this kind of tender it is important to have people in your team who will not think in a traditional way. It is important to realize in what kind of environment you will find yourself, you must be able to put yourself in the position of the other. Those tenders asks you to be decisive and dare to take risk. The contractor like this kind of tendering and would like to see more tenders in this way.
Design phase and collaboration during the design phase (D5,6,7,8)	

The client sees a good collaboration as essential for a good running Bouwteam. Up till now, the collaboration between the client and the contractor is going well. **The project start-up and the weekly meetings help to create a real team spirit**. Client: because we meet every week, you have to keep up to date and make sure to do you tasks. It would not be desired that one of the participants would drop out of the project.	According to the contractor: collaboration is very important. If the other party doesn't want to collaborate, it will have influence on every one of the project.
Project start-up (D12)	
The project start-up is seen as a boost to start the Bouwteam in the right way and to be able to get to know each other in a short time. And it is very important for expressing expectations to each other!	The project start-up had be arranged by the contractor. The PSU was very team focused. From every participant a personal profile image had been made, which was combined in the teams image, showing the strong and weak point of the team. It worked well and we would like to do a follow-up on this.
Price negotiation phase	
The first price estimation is given by the contractor to the client, and to satisfaction of the client. The negotiations were not finished at the time of the interview.	Based on the final design, prices and quantities will add op to the total price for the project. When we offer this price to the client, they will hire and third party to check this price. We have already compared our first cost estimate with the one of the client, and so far so good.
Construction phase	
The Bouwteam does not continue in the construction phase, according to the client. When the construction agreement is sign, the job is not that complicated anymore and the role division between the contractor and client will be more traditional.	When the design comes to completion another contractor will be involved who will construct the project. For the contractor it seems that the design phase should transfer in to the construction phase with the same team, only accompanied with an extra contractor.
Opinion about the Bouwteam in general (A1,6 & G1,2)	
Client: 'I am very satisfied with the way this is going'.	The contractor is happy with the way the project runs. There is respect between the participants and they support each other where necessary. The input of the contractor is taken seriously and this is appreciated by the contractor.
Other comments	
A Bouwteam is not a guarantee for a good project process, you have to stay committed to the project.	(-)

Survey client and contractor





Biggest difference between client and contractor

5. Quality

This is a relative unimportant difference because the scores are 5 and 4 which are both high.

7. Relationship continuity

As also found in the answers of the interviews, the client is more satisfied with the add value the Bouwteam gives to this project. The contractor is of the option that there is not a lot of added value for the project yet.

Relationship continuity	Client	Contractor
Because of collaboration in this project, we gain benefits for both parties.	5	(-)
This collaborative relationship makes it possible for both parties to develop unique capabilities.	3	3

8. Established relational norms

The difference in opinion about this factor between the client and contractor is related to the different opinions about the 'no blame' culture within the team. The Client is very satisfied about the no blame culture, and beliefs they are doing a good job. The contractor disagrees and is of the opinion that the client is not actively working to establish a no blame culture.

12. Coordination

The client and the contractor differ most on this point. Coordination is about the synchronization between the works of the different Bouwteam participants and if the interdependent tasks link well together. The client gives a 2 on both of the statements and the contractor a 4 on both.

Coordination	Client	Contractor
The work done in the teams is closely synchronized between the teams.	2	4
There is a clear linkage between the teams for their interdependent tasks.	2	4

Bouwteam Beta

Bouwteam Beta	
Project status at the time of research	Halfway the design phase, first cost estimate have been made by the contractor.
Desk Study	
Desk study	• Request for tender documents (Inschrijvingsleidraad) • Project planning • Form internal start meeting (client and Antea Group) • Notes of project start-up • Bouwteam agreement
Kind of project	Renovation of a pedestrian viaduct
Budget	€ 4.000.000,- excl. VAT as guideline
Tender procedure	Selective tendering within a framework agreement with four contractors.
EMVI (Economisch Meest Voordelige Inschrijving)	The contractors had to present a Plan of Action, including four risks and control measures. The tender was scored 100% on quality, no price element involved.
Construction contract	The construction agreement is in the form of construction specifications (Bestek) and the drawings. The contract is based on the UAV contract model.
Meeting frequency	One hour every two weeks.
Project start-up (PSU)	One daypart – mainly project focused, like a project introduction.
Planning	There was no detail planning upfront, but the client requested in the tender documents to start as soon as possible with the construction.
Costs	It seems the project will cost more than the estimated budget. Due to the bad condition of the construction. Through investigation in the design phase, it became clear that the state of the construction is much worse than expected.
Team composition	Client and contractor form the team together with their own advisors and an Antea Group advisor who is involved to manage the Bouwteam processes.
Client company	The clients company is a middle big municipality in the North-West of the Netherlands. In de last decades the have been working on several Bouwteams. But the team of this company for this project is not very experienced in Bouwteam. Some have been working in one or two Bouwteams, but those Bouwteams had a more traditional approach.
Contractors company	The contractors company is a known and big construction company with several branches across the Netherlands. They are active in construction, infrastructure, engineering and services.
Leading party	The contractor has been given the lead in this Bouwteam written down in the Bouwteam agreement by the client.
Contractor involved from	The initiative phase, before the design phase. The scope still needed to be defined in collaboration with the different Bouwteam participants.

Project description
The goal of this Bouwteam is to renovate the ‘pedestrian promenade’ and its associated connections, through major maintenance. The promenade is a kind of viaduct for pedestrians like a lifted street, giving access or border on to 1200 houses. This renovation should be done with as little nuisance as possible for the residents and within a short timeframe because of political pressure. The residents have been waiting for 10 years for the promenade to be renovated.
The available budget for this project is not sufficient, and although the residents like to see a ‘clean and whole’ promenade, the client expects the solutions will be mainly technical. When a bigger budget will be available the client will look at more liveable and aesthetic solutions.
The reason to choose for a Bouwteam was the unsuccessful tender based on a UAV-gc contract. The price based on the request for tenders offered by potential contractors were all significant above the budget and the cost estimate of the client, due to unknown high risks and some overseen scope. This experience and time pressure made the client decide to start a new tender procedure in the form of a Bouwteam. The client wants to use the Bouwteam to make a design based on thorough research to better know the scope and to be able to start the construction phase with as little risks as possible.

Tender phase
Antea group was involved in the Bouwteam tender phase to set up the contract, the tender procedure and to guide the process for selecting a contractor. In collaboration with the client, they examined what went wrong in the last tender, to make sure this tender would succeed. The total tender procedure took one and a half month.
Within the existing framework agreement for major maintenance within the clients area, four contractors were asked to respond to the tender and submit a Plan of Action for this project. The Bouwteam was awarded based on the criteria "Best Price-Quality Ratio", whereby the assessment was 100% on quality without maximum project budget given. Scored on risk management, environmental management and continuity of the work.
In the Plan of Action the potential contactor is asked to describe three (given) risks and the control measures, and come up with one more risk themselves. The potential contactor had to describe their interaction with the residents and how they would keep them satisfied. No presentation or interviews were held.

Design phase
A sum of maximal € 300,000 excl. VAT was available for the design phase. The design phase was used to clarify the scope, to do research and find the best solutions for the design. The design phase ends with an agreement for the construction phase.
In this phase pressure within the Bouwteam is rising. Through the research conducted in the field, the scope has become significantly bigger than thought in advance. Bigger scope also means that more money is needed. Because the project leader from the client side is not authorized to increase the budget on his own, they have to go higher up and make a request for more money, which is causing delays. Meanwhile the patience of the residents is tested. The design phase was supposed to be as fast as possible, but it is taking more time because of the new defined scope and the budget.
Every two weeks the Antea Group advisor and the client meet, half an hour before the meeting with the whole Bouwteam. In this half hour, they discuss what needs to be discussed in the Bouwteam meeting. The one hour Bouwteam meeting is used to discuss what has been done, to make decisions and set deadlines for the next meeting.

Price negotiation phase
The cost estimate is finished for 90% by the contractor and shown to the client and the other participants. Based on an open budget, negotiations can start. Accordingly to the Bouwteam contract, the contract for the construction phase is drawn up by the contractor. The expertise of Antea Group can be used to check the cost estimate of the contractor.

Construction phase
(-)

Observation
A onetime observation could be arranged during a regular Bouwteam meeting. Before the general meeting with most of the Bouwteam participants, a short meeting took place with only the project leader (client), project manager (Antea Group) and the technical advisor (client). In this half hour before the general meeting, those three discussed what they should discus in the general meeting. In the pre-meeting there was little time to discuss everything that was relevant. Several frustrations were expressed, especially by the project leader about the communication style of the contractor. The Antea Group advisor was leading the general meeting. For this meeting, the contractor had requested more time to discuss some urgent unforeseen matters. A half hour was added to the normal meeting of one hour. Communication during the meeting went well and all participants were able to add value to the discussion and solutions. In between the agenda points the project manager summarises the progress of the meeting. The point on the agenda took very long, and some questions from the client had already be discussed in former meetings, and the contractor and the Antea Group advisor had to repeat this. In the end they had to rush through the last agenda points and had to leave the meeting room quite suddenly without proper ending. In the hallway the Antea Group advisor and the contractor continued to discuss some more points. The client's participants had to leave right away. The atmosphere was friendly and there was space for some jokes.

Interviews		
Interviews were conducted with an employee of Antea Group, involved in this Bouwteam as project manager. An interview with the contractor and an interview with the technical advisor of the client. The employee of Antea Group and the contractor both had no experience in Bouwteams. The technical advisor of the client has worked in some Bouwteams before.		
Clients technical advisor	Contractor	Antea Group advisor
Why a Bouwteam? (C1,2,3)		
(-) The interviewee was involved in this Bouwteam after the procurement.	(-)	(-) Not involve at that time.
Benefits (D3)		
For this project it is very beneficial that the contractor will investigate the site of the project. Through this it is possible to find things before the construction started. The things we found have a lot of influence on the construction method, price and time. Therefor it is good that those things were investigated before the price was set and the project was procured. If we	Because we are working in a Bouwteam, it is possible to discuss the possibilities of the project in a realistic way even if there is a small budget available. There are no struggles with procuring to the lowest price and ending a project with a lot of additional work. Working in a Bouwteam gives us the opportunity to design in consultation. Through this we are able to better identify and estimate	Because we worked within a Bouwteam, we were able to investigate the existing construction. The investigation led to very useful information. If we would not have had this information, we would have a lot of problems and additional work in the construction phase. Another benefit of working in a Bouwteam is that the contractor with his construction experience can

would have found those things during construction it would have cost a lot more money and delays.	risks, book better results and have a more satisfied client.	help to improve the constructability of the project.
Success factors (D1)		
The contractor has to come up with smart solutions. The contractor should come with a good price for the client. The price is affecting the project a lot, according to the technical advisor.	Trust is a very important aspect in a Bouwteam. When there is no trust, the Bouwteam will not function well. Integral collaboration. Spending time together.	The AG advisor thinks it would be good to formulate the requirements in a more SMART way. Then it would be easier to steer on those requirement and get the project started.
Obstacles (A6)		
Disagreement on opinion or on prices. This makes is harder to trust the contractor the next time he comes with a price. An obstacle is the feeling that the contractor is not fully committed and a little waiting. The technical advisor had the feeling that the contractor's participants are not always well prepared for a meeting. They lack involvement beyond their own specialism and do not seem to care too much about the political complications of the project.	Contractor: When the client does not give priority to the project and does not finish his action point in time, it is hard to manage the overall planning. The contractor has the feeling that the client stands too far from the technical part of the project, and the role division is too traditional for a Bouwteam. The contractor things the client is expecting almost everything from the contractor.	Insufficient budget, too little time during the meetings, no urgency for the project. The AG advisor notices that the client participants have resistance against more collaboration within the Bouwteam. The client expected that the contractor does most of the work, comparable to integrated contracts.
Leading party (B4)		
(-)	The contractor sees the Bouwteam as the decision team of the project.	The AG advisor is the project manager of the Bouwteam and leads the meetings.
Tender phase (E)		
(-)	According to the contractor, the tendering was done in an 'interesting' way. Very little requirements and lot of freedom made it hard to estimate what the client wanted. It was not clear if the client wanted a Bouwteam or not, they decided to bet on that and	(-)

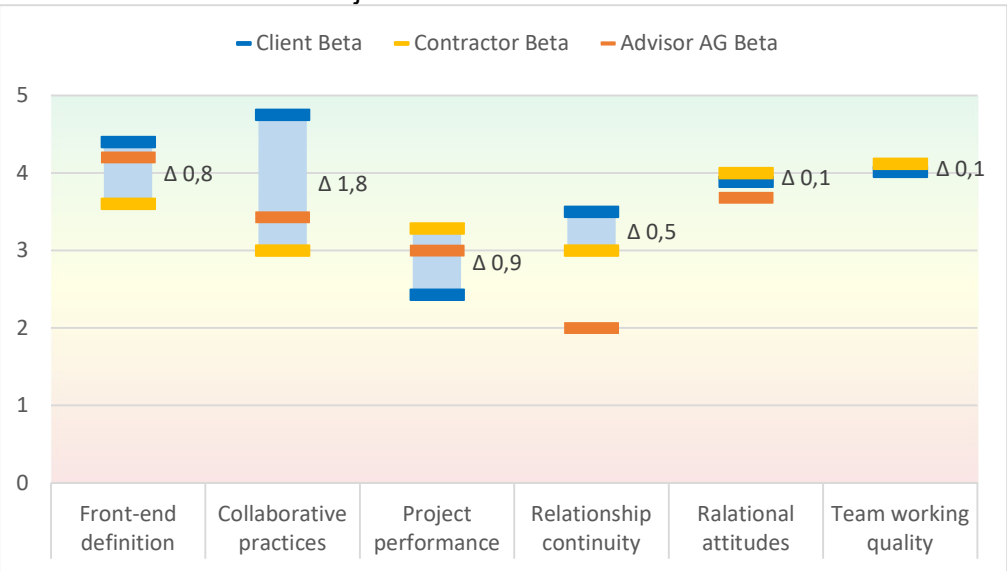
	steer in the direction of a Bouwteam.	
Design phase and collaboration during the design phase (D5,6,7,8)		
According to the technical advisor collaboration is very important, but it is not going very smoothly in this Bouwteam. He has the feeling that the contractor is passive and not working hard enough for this project. When we need solutions for a problem the contractor does not think outside the box, instead come up with the first and best solution and settle without considering other options. This gives the technical advisor an unsatisfied feeling. Technical advisor: it feels like they do not understand the importance of this project for political reasons. The technical adviser believes that 'one meeting every two weeks is enough, everything is very elaborated discussed'.	The contractor would have like to come together more often and work more integral together. Contractor: '*we are all doing our own things*'. According to the contractor it is important to meet more regularly to build up trust. He thinks that if they would have come together more often they would have been able to work more efficiently. One hour every two weeks is too minimal. There is more collaboration between the Antea Group advisor and the contractor in comparison to the collaboration with the client. The e-mail conversations are going well, and the input of the different participants during the meetings is also acceptable. But the contractor thinks that they could avoid some repetition in discussion through better coordination and more involvement of the client.	The Antea Group advisor sees the first part of the design phase as an investigation phase. With the information found during the investigation a suitable design should be made. In the beginning of the project the team struggles where to start. The client was waiting for the contractor to take the lead and the contractor for the client. The Advisor had to remind the client that they are working in a Bouwteam and that they are supposed to work together instead of expecting it all from the contractor. Even though the contractor suggested to focus more on collaboration and to have more meetings (more than once), the client was very reserved and did not want invest more time in the collaboration then they already did.
Project start-up (D12)		
Yes we did a project start-up and is was very good to get to know each other. But for me, a follow up is not necessary.	The contractor explained that they wanted to organise an elaborated project start-up and planned one whole day. The client thought this was not necessary and reduced it to one half day. The contractor believe the PSU was too much project focused and it would have been good to focus more on the collaborative relationship. The contractor would like to do a follow-up.	The PSU could help to formulate a common goal for this project.
Price negotiation phase		
I think it is strange that the design phase is paid by the client.	We have been designing several options for the project with the accompanying cost	The Antea Group advisor will help to check the cost estimate the contractor is making.

The contractor works with sub-contractors to which all the risks of the project are put away at. In this way the client pays a lot to cover all the risks while the risks might not fire. The client would like to work together with the contractor to tackle the risks and try to keep the price down, instead of just outsourcing them for a high price. Technical advisor: 'the contractor is as eel, they all work in the same way'.	estimate. Based on price and quality one of those options has been chosen by the client. We are finishing the cost estimate of this option in more detail now. But the extra budget for the project is not available yet.	
Construction phase		
The technical advisor believes that the Bouwteam stops when the construction agreement is signed.	According to the contractor, a Bouwteam does not continue in to the construction phase.	According to the Antea Group advisor: the Bouwteam ends when we have a clear scope, defined risks, price and a fitting construction agreement. The construction phase will be done in the traditional way.
Opinion about the Bouwteam in general (A1,6 & G1,2)		
In general the contractor is satisfied with the Bouwteam, but in the future he would make sure to make clear agreements upfront. For example about sub-contractors. And he thinks they are handling the risks and the costs in the wrong way. Technical advisor: '*it might be good to fix some prices at the beginning to the project*'.	The contractor thought there would be more collaboration between the client and the contractor, because the client procured this project as a Bouwteam. But for the contractor it feels more like an integrated contract in which the contractor does all the work. Their proposal to work together on one location and have more meetings was not accepted by the client. The client feels that one hour every two weeks is more than enough. The contractor thinks the work could have been done more efficiently, but the outcome would not have been different if they would have worked more integrated. The contractor feels like the client does not give enough priority to the project and is not always informed and sometimes unprepared, resulting in repeating discussions	Antea Group advisor: *'the Bouwteam is still alive'*. It is going okay, according to the advisor, but he expected more of it. The communication is going well, but I would like to see more collaboration.

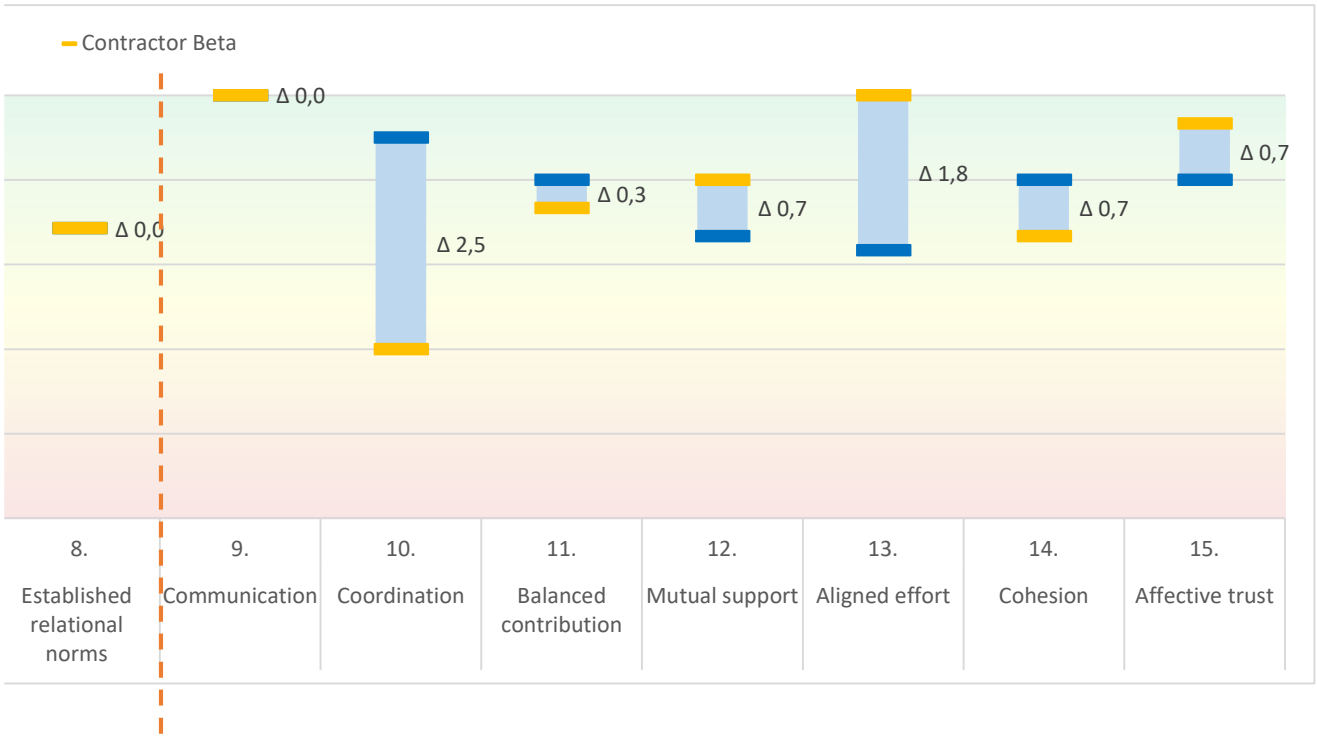
	about the same things. The client is not really involved in the technical design, and busier with the politics of this project. Contractor: It was good to not start right away, because otherwise we would have had a lot to unexpected problems.	
Other comments		
Technical advisor: 'every Bouwteam is different, it depends on who you are sitting around the table with'.	We were not able to understand what the client wanted based on the provided tender documents. In the next Bouwteam, the contractor would try harder to make sure to have a higher frequency of meetings.	Client: if the scope is not completely divined in the beginning of the project, make sure you do this as fast as possible, then you will have a starting point for the project.

Survey client and contractor

Overview of the 6 main subjects



Survey client and contractor



Biggest difference between client and contractor	10. Established relational norms It can be seen that the contractor has a very pronounced opinion, and seems to think they were not able to establish a 'no blame' culture with in the Bouwteam. It can also be seen that at f) the contractor gives himself the highest score, while the other interviewees did give him neural score. 12. Coordination This score is no surprise, it can also be found in the answers of the interviews. The client thinks it is going ok and likes it when the contractor does all the work. But the contractor thinks the work is done inefficiently and for the most part expected from them, while he expected a Bouwteam to be more collaborative. 15. Aligned effort Client and AG advisor both give a neutral score for this subject. The contractor give the highest score, while from the interview it could be said that he thought that the client does not show the expected effort for this project, but the contractor feels like he does. He has probably filled this in looking at his own effort. 16. Cohesion Again it can be seen that the contractor disagrees about how well the Bouwteam is cooperating together. As also mentioned in the interview by the contractor, he would like to see a more integrated team. The AG advisor confirm this, and also has the opinion that the Bouwteam is not very well integrated. As also was understood from the interviews, the client thinks it is going fine and likes that the contractor is doing a lot of work. 11. Communication One point on which they all score very his is the communication. All interviewees seem to be satisfied by the way this is going.

Bouwteam Gamma

Bouwteam Gamma	
Project status at the time of research	Project is completed
Desk Study	
Desk study documents	• Request for tender documents (Inschrijvingsleidraad) • Bouwteam contract • Planning • Descriptive document Bouwteam Gamma, Invitation to register. • Four submissions of potential contractors (Plan of Action, planning and CV project manager of the contractor) • Scoring from of the tender
Kind of project	Road reconstruction including sewer system
Budget (before tender)	€ 575.000,- excl. VAT. A maximum project budget for the entire process, set by the client.
Tender procedure	Selective tendering
EMVI (Economisch Meest Voordelige Inschrijving)	The potential contractors needed to present a Plan of Action including four risks and their control measures for those risks. Next to this, an interview was conducted with each of the potential contractor.
Construction contract	RAW-Bestek
Meeting frequency	Every week a meeting, but with a small part of the Bouwteam participants.
Project start-up (PSU)	The PSU was project focused, with little space for acquaintance and teambuilding.
Planning	The project was executed 2 months later than planned.
Costs	The project was executed within budget.
Team composition	The Bouwteam consists of the client and the contractor, who both had their own advisors. An Antea Group advisor was involved in the tender phase to support the client.
Client company	The clients company is a middle big municipality located in the centre of the Netherlands, within the municipality there is little experience in Bouwteams. Bouwteam Gamma was their first Bouwteam in many years.
Contractors company	The contractors company is a known company and one of the biggest construction companies in the Netherlands. The company combines activities related to property development, building and technology, roads and civil engineering in living areas, working areas and the areas connecting those two.
Leading party	The contractor has been given the lead in this Bouwteam as written down in the Bouwteam agreement.
Contractor involved from	In the beginning of the design phase.

Project description
Bouwteam Gamma was a road reconstruction including sewerage, close to the city centre. The technical part of the project was seen as simple, by both the client and contractor. It wasn't a very complicated project, technical nor other in other ways. The reason to choose a Bouwteam is unknown, it seems the client wanted to try a Bouwteam to gain experience in this way of working.

Tender phase
Antea Group was involved to help the client set up the tendering procedure. Antea Group wrote the documents for the tender with input from the client, like the request for tender document (Inschrijvingsleidraad), assessment criteria (EMVI criteria), the Bouwteam agreement and appendices. The tender procedure was a selective tendering for which four potential contractors were send a request for tender. In the tender documents the client applied a maximal project budget (Taakstellend project budget) of € 575.000, - excluding VAT. The cost of the design phase is included within this budget. The potential contractors were asked to submit a Plan of Action (Plan van Aanpak), Bouwteam planning and CV of the potential contractor's project manager. The potential contractors had to present the Plan of Action and interviews were conducted with the project manager of the contractors. In the Plan of Action they had to show how they would approach the collaboration, sustainability, participation and the financial aspects of the Bouwteam. Those points were also the criteria on which they scored the submitted documents and presentations.

Design phase
As described in the Bouwteam contract, the contractor will have the leading role in this Bouwteam. He is expected to come up with design options and to make the corresponding cost estimate for the design. The client will have to set the requirements for the design in time, review the different design options and will make the decisions. From the contractor's side, only the project manager would attend the Bouwteam meetings and pass the information on to the right person within the company of the contractor. It was rare when more than one person of the contractor's company would attended a meeting.

Price negotiation phase
From the first cost estimate till the price negotiations, there were 13 weeks planned, parallel to designing. But the design completion and the price negotiation took about two and a half mouth longer than planned.
Based on an open cost estimate of the contractor, the client was able to request changes in the design or request changes in price if they thought price was not right. The standard percentage for general cost, profit and risk were set at the beginning of the Bouwteam in the agreement.
The price negotiations took longer than planned, and have been experienced as unpleasant by both parties. Part of the price discussion was about the compensation for the design phase, although written down in the Bouwteam contract, the contractor claimed it was not clear to them that the cost of the preparations were included in the overall budget of 575,000,- euros. Other discussions were about what way of construction would be best, the contractor and the client had different opinions about this. It seems from the interview that both thought they were right and the other was wrong.

Construction phase
The total construction took four months according to the planning, but started about two months later than initially planned. At the time the construction started, project leaders of both sides, the client's and the contractor's side, were replaced by other project leaders. The construction went well, without a lot of changes of additional works to satisfaction of both parties.

No observation possible

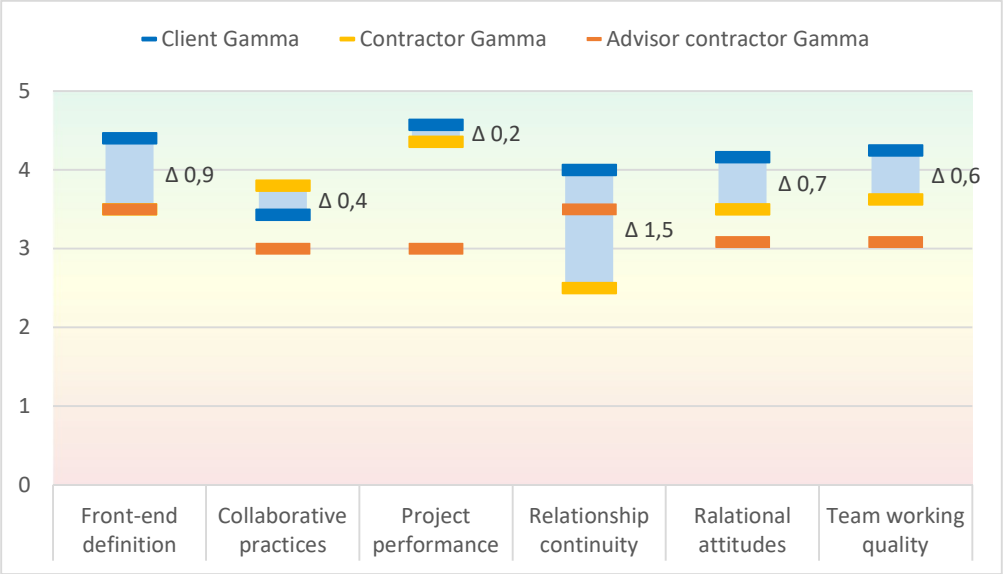
Interviews	
Interviews were conducted with the client, the contractor and the technical designer of the contractors company. The contractor and the technical designer were involved in the Bouwteam after one another. The contractor and technical designer were interviewed together at the same time. The client's project leader switched at the beginning of the construction phase, the interview is done with the project leader who was involved in the second part of this Bouwteam, during the construction phase. The client had not experience with Bouwteams, and this Bouwteam was the first one he worked in. The participants of the contractors company had some, but little experiences in working in Bouwteams. The technical designer was more involve in the beginning of the Bouwteam, design phase, and the contractor after the design phase. The Bouwteam they used to work in were more traditional Bouwteams.	
Client	Contractor
Why a Bouwteam? (C1,2,3)	
It was a pilot, they wanted to try a Bouwteam and gain experience.	We do not really know why the client choose a Bouwteam for this project, we believe they wanted to try it out. But the project is not very complex.
Benefits (D3)	
According to the client, the benefit of a Bouwteam is the possibility to use the knowledge of the contractor.	We had a meeting with the residents around the project area. In this way we could better take their interest in to account in the design.
Success factors (D1)	
Trust among the participants is very important, but according to the client, this is just as important in any other construction project.	Trust and transparency are very important.
Obstacles (A6)	
The client explained that five years ago the clients company had work together with the same contractor and the contract had ended in a 'fight contract'. Now five years later, they wanted to try working together again, but the client has still '*healthy distrust'.*	1) Not being able to involve all the needed stakeholders in time. 2) Unclear goals and interest of Client. 3) Modifications after deadlines. 4) Fixed maximum project budget. 5) Disagreement on price. 6) Too much focused on own tasks.
Leading party (B4)	
The client feels like the client and the contractor are both in the lead, on an equal basis. The contractor was the one who would lead the meeting, but for the client it felt as if they had both the same influence.	The contractor experiences as if they were in the lead because the client expected they would manage the team and the project. Reflecting on the job done, the contractor believes that the client would have been able to make the same design without the contractors input. The contractor found it hard to manage the participant in the Bouwteam, who work for the client company, and believes that the client's project leader should have been more active in involving the participants of the client's side of the Bouwteam.

Tender phase (E)	
(the interviewee was not involve in the tender phase)	The contractor thought it was too much focused on the person rather than the Plan of Action.
Design phase and collaboration during the design phase (D5,6,7,8)	
According to the client: the design phase went fine, but in the end there was no specific value added to the project through the Bouwteam. The client believed this project could have been done just as well in the traditional way of working. The collaboration did not go smooth during the design and price negotiation phase. During the construction phase the collaboration between the client and the contractor was better.	The contractor is of the opinion that the client did not clarify their goals and their interests in time, and kept making changes to the design, even though the jointly set deadline by both the client and the contractor, was already exceeded. They kept giving a lot of input and requirements. The client expected that the contractor would make changes to the design time after time, which has cost a lot of time and money. The contractor experienced that the different specific divisions within the client company did not take the other divisions of their own company in to account when changing specifics of their own divisions of the project design. When the contractor needed specific data from someone of the client side it was not always available. The contractor felt like the clients project leader did not keep their side of the team together, and it was hard for the project manager of the contractor side to manage the team members inside another company. The contractor suggests the Bouwteam should have two project managers, one from the client side and one from the contractor's side. The contractor experienced that the different specific divisions of the client did not take the other divisions in to account when changing specifics of their own divisions. When the contractor needed specific data from someone of the client side it was not always available. The contractor felt like the clients project manager did not keep their side of the team together, and it was difficult for the project leader of the contractor company to manage the Bouwteam participants of another company. The contractor suggests the Bouwteam should have two project leaders, one from the client side and one from the contractor's side.
Project start-up (D12)	
(-)	The project start-up was project context focused. It was used to introduce the project. For some of the participants of the client's side, this was the first meeting they had for this project. Some participant had

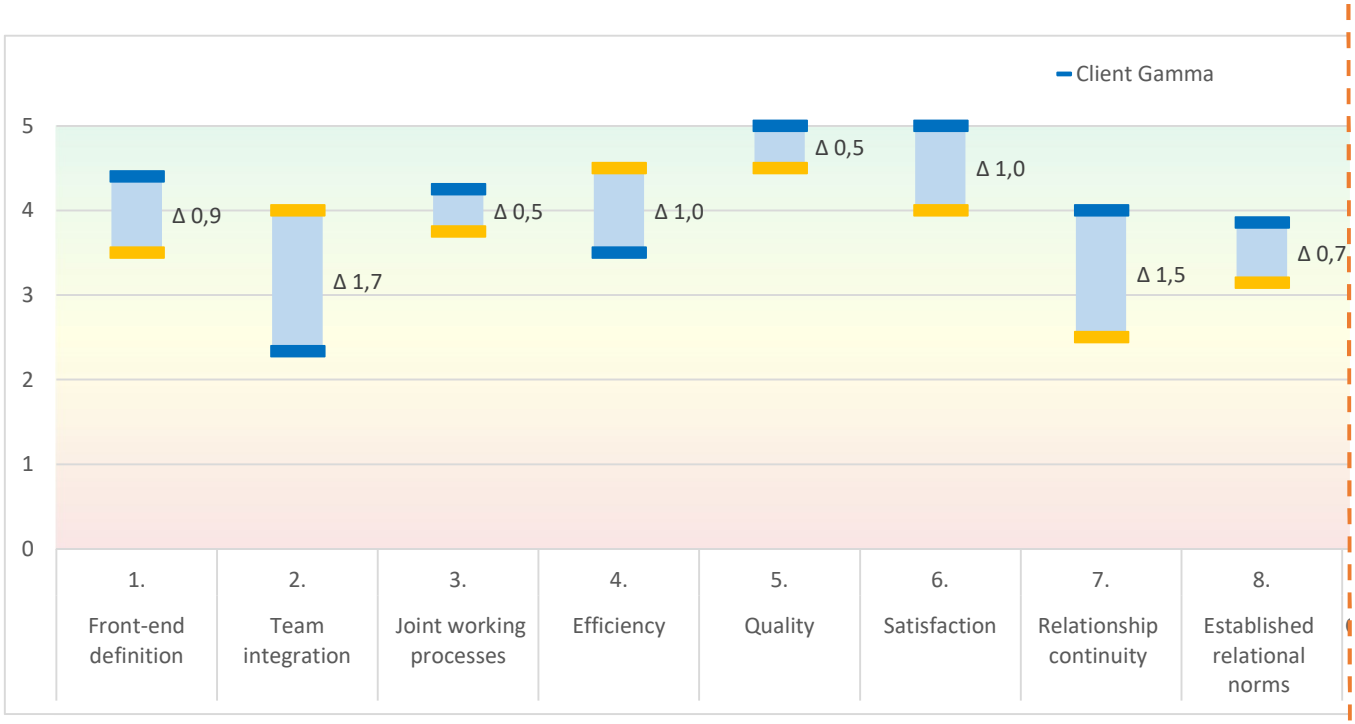
	not even red in to the project yet, which was not positive and showed lack of devotion according the technical designer.
Price negotiation phase	
The client explained that because of misunderstanding about the compensation for the design phase they had long and hard discussions about the price. It was difficult to agree on the way of execution, because the client liked to see it differently than the contractor had designed it and though it was best.	Because of our open price estimation, which was shown to the client, the client would try to lower the price of almost every material or part. But when the contractor asked where the client based there prices on, they wouldn't say. In the end it became clear, the prices were based on two or three years ago, when the market was very different and not comparable to the prices of this project. Eventually, the director of the contractors company stepped in to not go any lower with the price, or the contractor would withdraw from the project. The client accepted this final offer of the contractor. To be able to prevent another Bouwteam process like this one, the contractor suggest to select a contractor based (partly) on the lowest price, instead on a given maximum project budget. The client got what they wanted, constructed in the way they wanted, but not for the price they wanted.
Construction phase	
The construction agreement was a RAW-bestek and was executed in a traditional way, in which the client was minimal involved. During the construction phase the client and contractor met ones every 4 weeks to discuss the progress. The client agreed that the construction went smooth, within budget and time, without discussion about additional work, which worked pleasantly because the contractor could focus on the execution instead of worrying about the cost of additional work.	According to the contractor, the construction phase went very sooth without big changes. In comparison to other more traditional projects, this Bouwteam had very little changes during the construction.
Opinion about the Bouwteam in general (A1,6 & G1,2)	
Client: 'I am satisfied about the Bouwteam, only not about the price negotiation phase'. The client thinks that this project was not suitable to execute through a Bouwteam. The client did not really use the expertise of the contractor.	The contractor like the experience of meeting the residence of the project area and feel like you are really making a design for them.
Other comments	
Because the job was not very complicated, the client did not find a lot of added value to the project because of the use of a Bouwteam.	They would like to work more often in Bouwteam, but only when the project is more complex. In that way they will be able to use their knowledge to add value to the design and make a better project for a lower price.

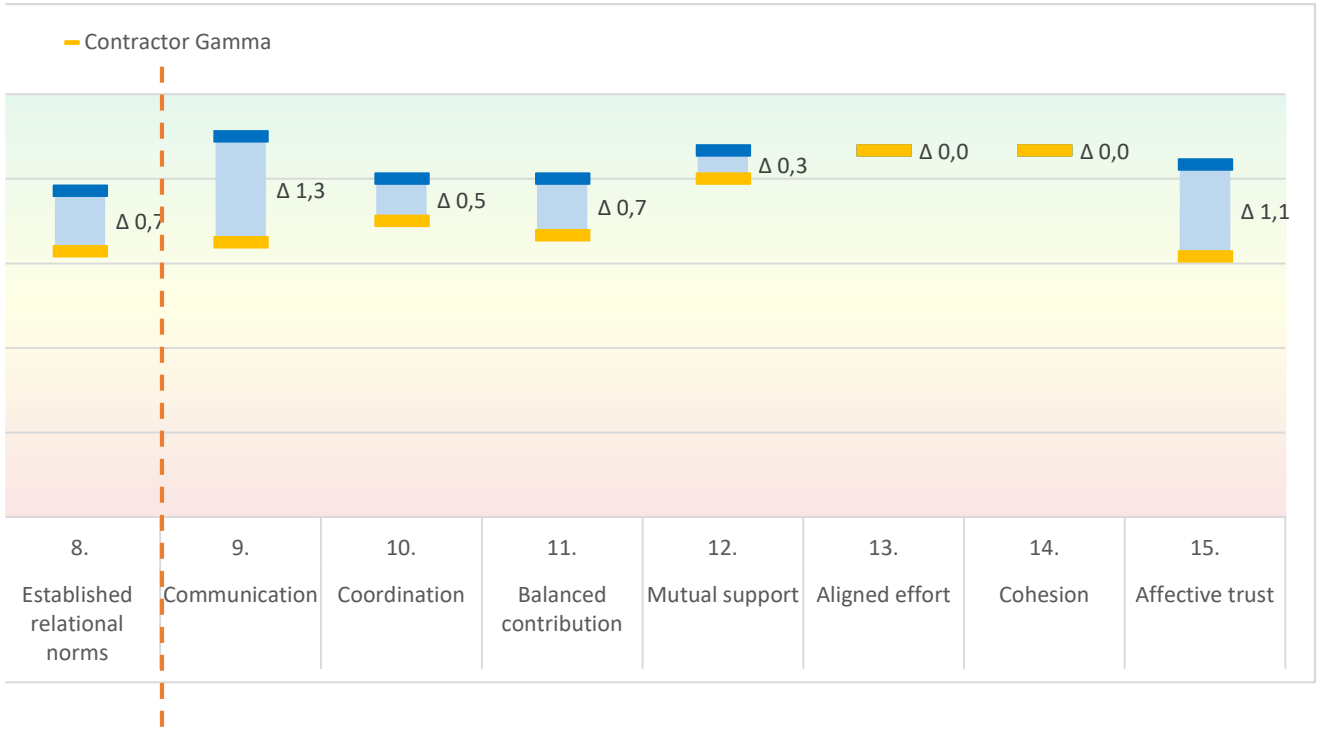
Survey client and contractor

Overview of the 6 main subjects



Survey client and contractor





Biggest difference between client and contractor	7. Relationship continuity Client and contractor differ in opinion on the added value of the Bouwteam for this project. The contractor does not yet see the added value. 11. Communication Contractor and technical designer agree on this point and think they could be improved and the score it with an average of 3.25. The client is more positive of satisfied with the situation and scores with a 4.5. Especially the different scores on the statement: *project relevant information is shared openly by both teams*, stands out. The client gives a 5 and the contractor a 2. 15. Aligned afford The technical designer disagrees with the client and the contractor on the statement: *there is no conflict regarding the effort that each team put into this project*. The technical designer did feel like there was conflict regarding the effort and the client and contractor did not. This can be explained by the fact that the current client and contractor representatives were not involved in the price negotiation phase and the technical designer was. 16. Cohesion The technical designer indicates that the cohesion is less optimal that that the client and contractor indicate. 17. Effective trust The technical designer gave the 2 to the statement: *Both teams keep their promises*. While the other participants score this with a 4. The contractor gave the score of 2 to: *Both teams work with high levels of integrity*. While the client scored this point with a 5 and the technical designer with a 3. Other: 2. Team integration Both the client and the contractor indicate that they do not invest enough in teambuilding by scoring on this criteria with a 2. They are not satisfied with the way the team is integrated.

Bouwteam Delta

Bouwteam delta	
Project status at the time of research	The project is halfway the construction phase, parallel to this the engineering part of the design is optimized.
Desk Study	
Desk study documents	• Risk document collaboration Bouwteam • Bouwteam agreement
Kind of project	Construction of fish passage
Budget (before tender)	-
Tender procedure	Selective tendering within a framework agreement.
EMVI (Economisch Meest Voordelige Inschrijving)	The tendering had no price element, but was procured on quality. The potential contractors had to show their vision on the project, construction and collaboration and explain how they would come to a price.
Construction contract	UAV-gc, with payment on 'regiebasis'
Meeting frequency	Once every week
Project start-up (PSU)	The client and contractor have been working together in former projects. After the contractor was selected, a project start-up with all participants of the Bouwteam was organized. The PSU was project as well as and process focused. The project was further introduces and they discussed each other's personal strengths and pitfalls to get to know the team. They analysed the risks of working together in the Bouwteam. To maintain a good relationship, some Bouwteam members would have dinner together from time to time, initiated by the client.
Planning	They are still running according to schedule.
Costs	The project will probably be constructed with in the available budget.
Team composition	Client and contractor, Antea Group (contract management) and an engineering company with different advisors.
Client company	Water board, a regional government body who is responsible for the water management in an area.
Contractors company	The contractors company is a smaller local construction company.
Leading party	The contractor has been given the lead in this Bouwteam, written down in the Bouwteam agreement by the client.
Contractor involved from	The initiative phase, before the design phase.

Project description
The goal of the project is to realise a fish passage next to a lock. The client had been investigating the possibility for the construction of a fish passage for some time when there came a possibility for subsidy for this construction. A condition to get this subsidy was that the fish passage had to be ready within a certain timeframe. Suddenly this project had an urgency, but the scope and requirements were not yet defined. This was the reason to choose for a Bouwteam, the time pressure and undefined scope.

Tender phase
Antea Group was involved before the tender phase, to give the client advice on the contract forms. Antea Group was not involved by setting up the tendering procedure or the corresponding documents. The tendering procedure was a selective tendering within a framework agreement. Four contractors were invited for the tender. The job was awarded 100% on quality, by scoring the submitted documents of the contractors. In the documents, the contractors were asked to write their vision on the project and collaboration, the construction and the way they would come to a price for the construction.

Design phase
The first assignment for the participants of the Bouwteam after the selection of the contractor was to set the scope within the set budget. In a short time frame, the design had to be made for the fish passages in order to start in time with the construction. Next to the client, the contractor and their in-house advisors, there was a consultancy company involved. The contractor involved this consultant company, to support the client and the contractor in the more specific disciplines, like calculations, environmental management, and ecological knowledge. The team came together every week with the client, contractor and relevant advisors for the specific meetings and a deputy of the consultancy company.

The Bouwteam had started good and everyone was excited, designing a nice fish passage, without paying too much attention to the budget. When a price estimate was made, it became clear that the design was too expensive, but the time and money available for the design phase was almost finished. With some struggles the Bouwteam managed to reduce the cost of the design.

Price negotiation phase
In the end of the design phase, the Bouwteam participants would start to look at the costs of the design and came to a price based on an open cost estimate of the design. The project price and the budget did not match, negotiations about different design options started and led to a better fit. The design phase ended with signing the UAV-gc contract. The contractor could start planning the construction and parallel to this the contractor will do some small optimisation and detailed engineering.

Construction phase
With the completion of the design phase, the consulting company has completed their job for this Bouwteam and the client and contractor proceed in this Bouwteam together, with their own in-house knowledge.

The construction is running according to plan. This is an important aspect because realising de construction in a curtain timespan was a criteria to be able to receive the subsidy. The weather has been good and little risks have occurred. The construction is on ‘regiebasis’, because of the risks of the construction. They have not agreed on a fixed price for the construction phase, but they have a budget and the contractor is pays for what he does on ‘regiebasis’. The money that is left can be just to optimize the quality and aesthetics of the project.

No observation

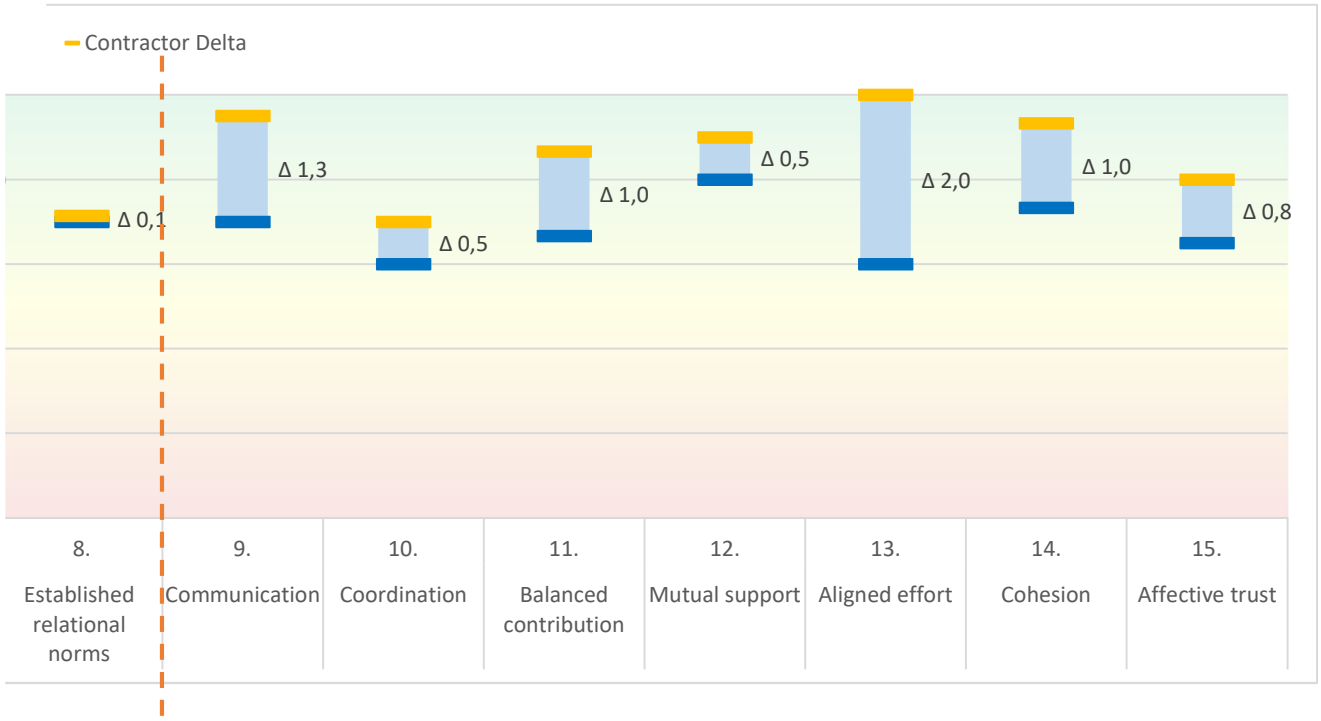
Interviews	
In this case the interview has been done with the client and the contractor at the same time. It is likely that they will be less open about frustrations towards the other party during this interview, because the other party is present and they will still have to finish the project together. The client did not have a lot of experience with Bouwteams. The contractor has done several Bouwteams, but those Bouwteams were with a fixed price and a UAV contract for the construction phase, instead of payment on 'regiebasis' and a UAV-gc like in this project.	
Client	Contractor
Why a Bouwteam? (C1,2,3)	
Because of the possibility of subsidy for this project, the project had to be procured and constructed in a short time period. The scope and project description were not completely defined yet, so the project could not be procure with a standard traditional tendering. This is why they choose for a Bouwteam. By doing so they were able to procure the project only ones, faster and without having to specify the project in detail for the tendering.	(-)
Benefits (D3)	
For the client it was found to be beneficial to only procure the project once upfront. It saves time in comparison with the traditional way of procuring.	(-)
Success factors (D1)	
1) Be open and honest and speak out when you are not satisfied with something. 2) Make sure to let the other Bouwteam participants know when you will not be able to finish something in time. Then you can discuss it together and find a different solution or someone else might be able to finish your work. 3) Make sure to keep each other up to date about the progress. 4) The interests of the different participants need to be clear, just like the main goal.	Payment on 'regiebasis'. Keep everyone involved. Putting in equal effort. Be transparent about price. Short communication lines, is means regular meeting and phone calls when needed.
Obstacles (A6)	
A hidden agenda is seen as an obstacle for a good running Bouwteam by both the client and the contractor.	Hidden agenda. Little time and a lot of work. The difficulty of stand out during the tender. Different manner of working of the participants. Different working styles. Unfulfilled expectations or wrong expectations.
Leading party (B4)	
As written in the contract, the contractor is in the lead. The contractor thinks it might would help if one person within the Bouwteam would	(-)

have been appointed to focus more on the process and teamwork. This could be the contractor, but this should then be specified in a task description.	
Tender phase (E)	
The client was satisfied with the tender procedure and the outcome of it. But it was hard to select a contractor base on the set criteria. The client already knew the potential contractors, because they work together within a framework agreement of the water board. The client knew he would be able to work with all of the potential contractors, all contractors would have done a fine job according to the client. The presented plans of the different contractors were all similar and good plans. The client found it difficult to make a distinction between the contractors, which made it hard to select the 'best' option. Client: maybe we should do this differently in Bouwteam tenders of the future.	This way of tendering made it hard for the contractor to distinguish himself from the other potential contractors. The contractor beliefs that: because the client selected the contractor on soft criteria, it is difficult for the contractor to estimate how he could win the tender. It felt like it is a matter of luck when you get the job. According to the contractor: the focus of the selection criteria should also be (partly) focused on the context of the project, and not only on soft skills.
Design phase and collaboration during the design phase (D5,6,7,8)	
The client liked the way the Bouwteam started because everyone was excited in the beginning, resulting in a nice fish passage design, but without paying too much attention to the budget. When the design turned out to be too expensive the tension within the Bouwteam rose. The client felt as if the engineering company did not act on the request of find other, cheaper design solutions, and were not devoted to the project. The client likes that you are able to talk about the best technical solution together and that you are able to involve the contractor in the early phases to optimize the design. Even though there were struggles in the design phase, the collaboration between the client and contractor went well. In the end, they even organised some dinners together. This was important for a good relationship, according to the client. Collaboration with the consulting company became more difficult when the tension rose about the price of the design and the amount of available workhours. The contractor felt the same and it was hard for the contractor to motivate the engineering company and to keep the right	According to the contractor, the participants differed in the way they worked. The participants of the clients company are really passionate about their work, technical and details orientated, and they did not fit the work styles of the people less devoted to the project, like the engineering company. The contractor said: '*smaller companies and bigger ones do not always work well together. The bigger companies can be more cumbrous and have higher rates*'. The client agrees and continues: '*I like short communication lines, to be able to switching fast and I work with passion for the project*'. The client and the contractor are both working for 'smaller' companies, the contractor is of opinion that this makes it easier for each other to connect and have a good collaboration.

people focused and involved. Time was passing and the costs for adjusting the design kept rising. The contractor had also struggles with communicating because the consulting company did not send all the specialist themselves but deputies, who hat to transfer the specific project information to the different specialists	
Project start-up (D12)	
The client found the PSU was very valuable. They got to know each other and learn about each other's strengths and pitfalls. Client: 'but we were not able to prevent people from stepping in their own pitfalls when things got more tensed in the design phase. The client tells during the interview: '*we saw everyone stepping in their own pitfalls which we discussed during the project start-up'*. But no one felt like he or she was the one to point this out or try to do something about it.	Contractor: the PSU really helped to find each other's strengths and weaknesses, but we did not do anything with it when we could.
Price negotiation phase	
(-)	The contractor is used to work in Bouwteams where they would set a fixed price for the construction instead of payment on 'regiebasis' like in this Bouwteam. According to the contractor: setting a fixed price works well when you are able to properly estimate what the project will cost. If there is a lot of risks involved or parts of the design still need to be developed, it works better to not set a fixed prices for the construction.
Construction phase	
Especially in comparison with the end of the design phase and the price negotiations the construction phase went very well. The client belief that they are paying a fair price in this way, they pay for what is done (regiebasis). He believed it would have been more expensive when they would have ask the contractor to give a price on the project including all the risks of the construction. The client: the collaboration went smoother in this phase, now the consultant company was not involved anymore and they agreed on a maximum budget for the project.	The contractor thought this phase went very well. The construction phase has been experiences as pleasant by the contractor, working on 'regiebasis' and without hidden agenda. The UAV-gc contract gave space to optimisations in the design after finishing the Bouwteam contract. They set a maximum budget for the construction but, the contractor is paid on 'regiebasis'. The contractor liked this way of payment, because then he does not have to struggle and calculate all the additional work. '*In this way*', contractor: '*the client pays a fear price for what he gets, and we can earn our bread*' The contractor: '*it works great when it is not about money or the profit margins all the time, instead we can focus on the construction and the best solutions*'.
Opinion about the Bouwteam in general (A1,6 & G1,2)	

The client is satisfied:' *i am satisfied about the bouwteam, it works pleasantly*'. He said he would like to work in more Bouwteams in the future.	The contractor was also positive about the total project. Especially the construction phase, without the engineering company involved. He feels like they can finish the project in the right way with a fair way of payment.
Other comments	
Client: The communication goes very well, when something needs more explanation or changes we can just give each other a call and discuss what steps we are going to take. We managed to establish a good collaborative relationship and can trust each other.	The contractor mentions again the difference between bigger and smaller companies, which do not always work that well together, because they think differently and have a different level of devotion to the project.

Survey client and contractor



Biggest difference between client and contractor
The client commented that he had filled in the survey with the design phase in mind and for all the involved parties, not just de client and contractor. The contractor focused more on the entire project, which eventually develop in to a good construction phase.

The biggest differences can be seen at project performance and relationship continuity. The opinions of the client and the contractor on the other points lay close to each other.

Project performance (sub-criteria 4, 5 and 6)
The difference in opinion on project performance can be explained by the comment of the client about the RECAP. The client and contractor both were not satisfied about the project performance in the design phase, but they are both satisfied about the construction phase. Since the client filled in the RECAP focusing on the design phase and the contractor focusing more on the overall project, it is logical that the client scores lower than the contractor.

11. Communication
The client gives a lower score on this point than the contractor. The client gave an average of 3.5, a little higher than neural, to the main subject communication. The contractor gave a score of 4.8, almost perfect. The difference was biggest on the point: Project-relevant information is shared openly by both teams. The client gave a 3, enough room for improvement, while the contractor scored this point with a 5 (highest).
It is suspected that the difference in given scores is bigger than they really should be, because the client filled in the RECAP focusing on the design phase and the contractor focusing on the entire project.

13. Balanced contribution
Comparable with the scores of communication, the client gave an average score of 3.3 and the contractor 4.3 to balanced contribution. Also this difference in scores is mostly dedicated to the different focus of the client and the contractor while filling in the surface.

15. Aligned effort
The client gives an average score of 3 and the contractor with an average of 5. The biggest difference in scores are for the statement: Both teams give their project the priority it needs. The score of 2.5 is given by the client and a 5 by the contractor on this statement.

This bigger difference in score can be assigned to the commented of the client about filling in the survey. The client also looked at the performance of the engineering company, which he thought were not optimal and of which the client had the impression not to put a lot of effort in to the project.

Bouwteam Zeta

Bouwteam Zeta	
Project status at the time of research	The construction phase was almost finished. One week of construction was left at the time of the research.
Desk Study	
Desk study	• Request for tender documents (Inschrijvingsleidraad) • Bouwteam contract • Project planning • Descriptive document Bouwteam Zeta, Invitation to register. • Cost estimate before tendering • Risk document
Kind of project	Sand accumulation and preloading of the grounds.
Budget	€ 700.000,- excl. VAT, this is the budget for the total project, including the design phase, preparatory work and realisation. The budget was based on a pre-design made by Antea Group.
Tender procedure	Selective tendering
EMVI (Economisch Meest Voordelige Inschrijving)	Based on a presentation on risk management ideas and an interview with the potential contractors the contractor was selected.
Construction contract	RAW Bestek with corresponding drawings and documents.
Meeting frequency	Ones every two weeks.
Project start-up (PSU)	The PSU was elaborate and set out to get to know each other. They discussed each other's strengths. Based on the strengths they divided the IPM roles over the Bouwteam participants. IPM: Integral Project Management. This IPM method divides the project participants in to 5 different roles: project management, project control, environmental management, technical management and contract management.
Planning	The project took 2 weeks longer than planned but without consequences for project success.
Costs	The project was completed within project budget.
Team composition	Client and contractor, both with their own advisors.
Client company	The clients company is a province of the Netherlands, within the province there is little experience with Bouwteams and the wanted to explore the Bouwteam method, to increase the possibility of collaboration between client and contractor.
Contractors company	The contractor is a reginal construction company, with little less than 100 employees. They are specialized in infrastructure, clean-up, demolition, hydraulic engineering and nature construction.
Leading party	The contractor has been given the lead in this Bouwteam, as decided by the client and written down in the Bouwteam agreement.
Contractor involved from	From the design phase.

Project description
The goal of this project is to complete the sand accumulation and preloading of the grounds in time. This project is a smaller project within a bigger area development project. The client decided to take this job out of the bigger project to reduce time pressure and uncertainties of the preloading and setting of the ground. For this project the client works together with a local contractor who has a lot of experience in this kind of works.
The client chose for a Bouwteam to have more influence on the progress of the project and make sure it would have been executed in time. By working together within this Bouwteam, the client hoped to be able to exclude risks by bundling knowledge and expertise. Antea group was involved to execute investigation about the surroundings and environment of the project. Antea Group was also involved to help the client with the tender procedure.

Tender phase
Antea group help the client to set up the tendering process with all the associated documents. Through selective tendering, a contractor was asked to execute the design and construction part of the project. The selection of the contractor was based on a presentation of a Plan of Action and on the interviews with the potential contractors.

Design phase
During the design phase the contractor is taking the lead and the client is working together with the contractor on the agreed tasks. This design phase is executed under the Bouwteam contract and is finished when they formulated and signed the construction agreement. The direct communication during the meetings worked very well and enabled a good collaboration and understanding of each other interests.

Price negotiation phase
The maximum project budget provided an indication to the contractor to be able to make a fitting design. In the Bouwteam contract, the general cost of the construction have been set up front. The contactor keeps track of the cost during the evolvement of the design to make sure it will fit the budget in the end. Near the end of the design phase, the contractor calculates the total cost of the project. After some discussion about the units and quantities they reach an agreement on price under the maximum budget.

Construction phase
The construction phase started when the RAW-Bestek was ready and they agreed on a price for the construction. The execution of the project when smooth. The frequency of meetings was reduced to once in 4 weeks and this was enough to discuss the progress of the project. The execution could be done without problems, small changes were easily solved though collaboration of the client and contractor. Because of the established relation and short communication lines, it was possible to make fast changes when this was needed which was seen as beneficial for the time schedule of the execution and project success.

Observation	
Context and who was present	It was possible to be present a Bouwteam meeting at the end of the project, at his time realisation of the project was almost completed. We met in the site office of the contractor early in the morning, 7:00h. Two site workers and contractor are waiting for the rest of the meeting to come. The contractor and a secretary are present of the contractor's side. Of the clients company, three people are present, among which a hired contract manager. The last person to arrive is the project manager of the clients company. The atmosphere is pleasant and the present people seem to know each other well. They talk about all kind of things and drink coffee until everyone is ready to start. The contractor starts with an introduction of the project for the observer and continues with the description of the progress of the project.
The meeting	The meeting progresses pleasantly. The contractor takes the lead in the meeting and guides the meeting through the points that need to be discussed. Process as well as substantive topics are discussed and explained to the client. They seem to have genuine interest in each other and make effort to understand or explain. One point on the agenda was to discuss additional works and who is supposed to pay for that. The work took two more weeks than scheduled. The client and contractor divided the cost for those two weeks equally without discussion. Also some other extra work and cost were divided easily over the two parties. In the end of the meeting they always have an evaluation point, which gives space to discuss what went well and what can better. Both the contractor and the client gives positive feedback about the other and discuss some optimisations about information sharing.
Other	After the meeting most of who were present take a look on the site. The contractor shows us what they did and shows that everything is as it should be. The project is almost done, only the ground will need to set in the coming months. Everyone seems to be satisfied by how the process and the project went.

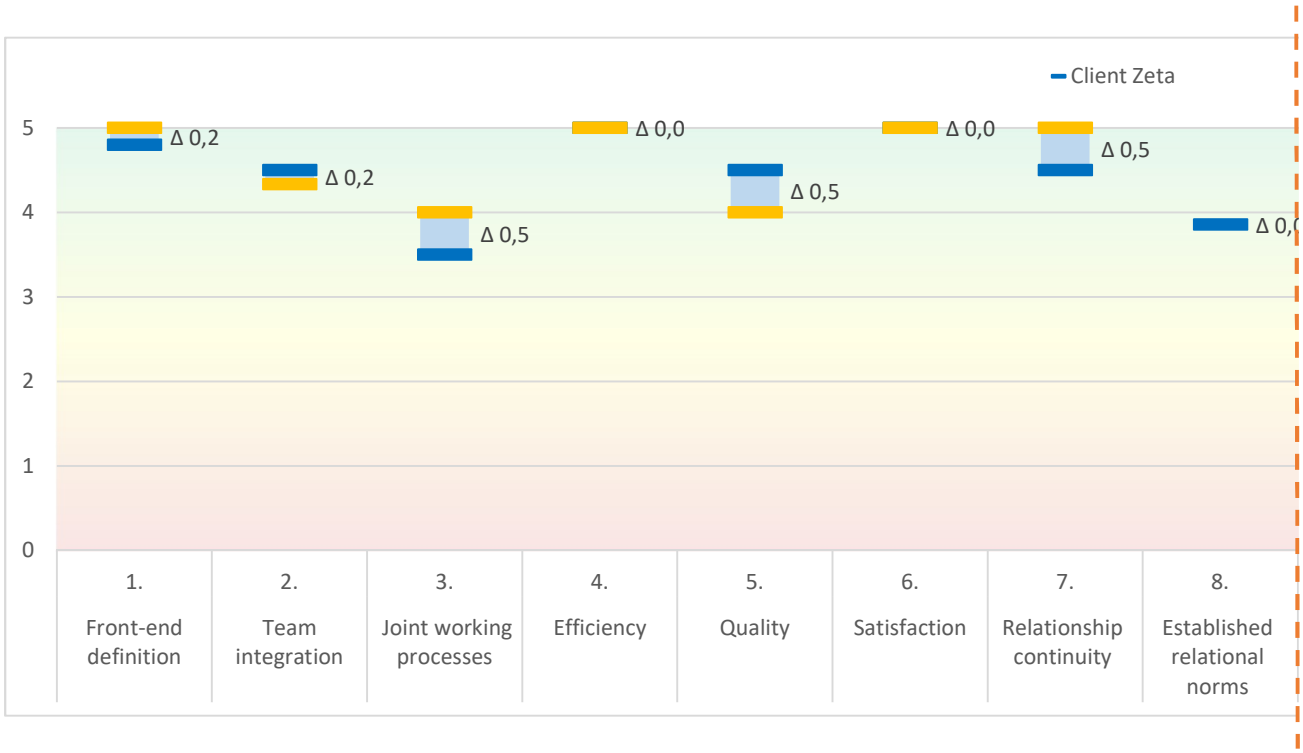
Interviews	
Interviews were conducted with the client and the contractor of this Bouwteam, separately. The client has no previous experience with Bouwteams, but has been working in contractor sector. He believes this helps him to emphasize with the interest of the contractor, which can improve the collaboration between them. The contractor has worked in a lot of Bouwteam, contractor: 'Bouwteams work very well'. The contractor believes a Bouwteam can deliver a 'win win win' situation for both the client and the contractor, by working effectively and efficiently together.	
Client	Contractor
Why a Bouwteam? (C1,2,3)	
Client: A Bouwteam is a collaboration agreement. In this agreement, everyone uses his or her strengths based on IPM roles and this improves the collaboration. Through collaboration and trust you can	A Bouwteam is a collaboration between the client and contractor and its delegates / specialists and a third parties. In which those parties collaborate based on trust and

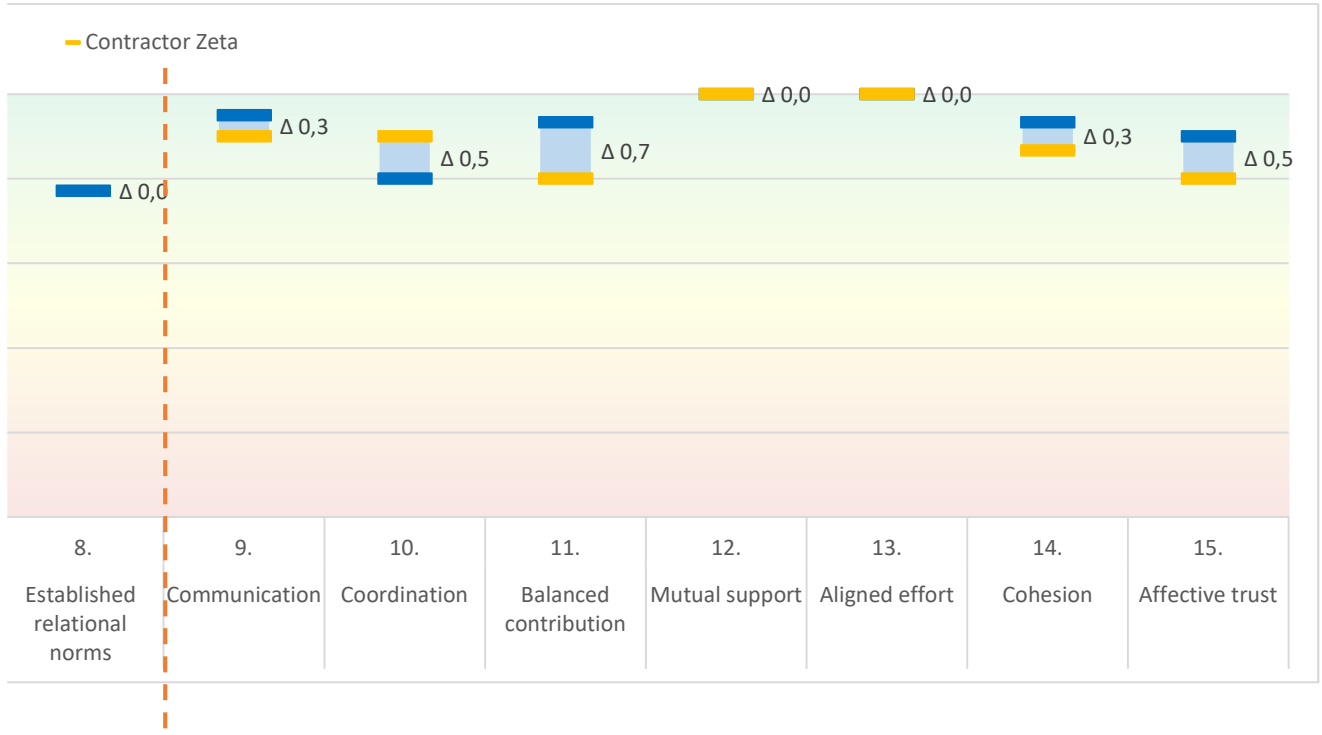
reach a better and result. (IPM = Integral project management)	openness, from the initiative phase to get the ‘best for project’.
Benefits (D3)	
1) A smooth and fast project process. You only have to procure the project ones at the beginning, this saves a lot of time.	1) The design we make is constructable, because otherwise we give ourselves a hard time during construction. 2) By the regular meetings within a Bouwteam everyone knows what is going on and makes it possible to switch fast. 3) Because the price is set after the design is finished and there is space for price negotiations, it is possible to discuss the cost estimate and come to a fair price for both parties.
Success factors (D1)	
1) For the tendering it is very important to formulate the right criteria to select the contractor, especially about the collaboration. It is important to get the chance to speak to the contractor face-to-face, to see if you have a connection. 2) Sharing information, be open and honest. 3) Sharing each other’s products. 4) Being involved in each other's choices. 5) When things change or turn out different, you have to make sure it can be discussed within the team so you can find a solution together. 6) A good collaborative relationship is very important for a smooth and fast process. 7) Make sure that all the agreements on prices, task and expectations are very clear for all participants from the beginning of the project.	1) The focus on openness, contractor: ‘this leads to an effective and fast process’. 2) Meet each other often and discuss how and what the next steps will be. Contractor: because of our two-weekly meetings it was possible to get direct feedback on your work, than you know for sure you understand each other. 3) Make sure to get to know each other. 4) Friction should be discussed immediately. For example, by adding an evaluation point at the end of the meetings. Contractor: ‘discuss what went well and wat could be better’. 5) You need to give the client enough time to be able to make decisions based on the available relevant information. 6) Create understanding of each other. 7) Discuss the products you make and check if it is what the client had in mind. 8) Be and stay informed and up to date. 8) Make the requirements for the project SMART. 9) A good collaborative relationship is crucial.
Obstacles (A6)	
1) Money is always an obstacle. Client: also in this Bouwteam, the contractor wanted to make it more expensive than needed. This did not improve the trust between the client and the contractor.	1) An obstacle can be when the client does not know how a Bouwteam works of if the client has not experience with a Bouwteam.
Leading party (B4)	
The contractor was in the lead. It was based on the IPM roles. Most activities were technical which made it logic for the contractor to be in the lead.	According to the contractor the basis for a Bouwteam is a mirrored organization by the client and contractor side of the team. Not one leader but two, one from the clients company and one of the contractors

	company. The contractor works for the client but can take responsibility for curtain task or even take the lead within the project.
Tender phase (E)	
The contractor was satisfied with the way of tendering. It turned out how he thought it would be.	The tendering process was focused on collaboration. The contractor is of opinion that the focus on collaboration and openness was continued in the design phase and was positive for the project.
Design phase and collaboration during the design phase (D5,6,7,8)	
The relationship between the client and the contractor was '*good and professional*'.	The quality of the collaborative relationship is very much depended on the people involved. During this project they worked together: '*constructive and effective'* according to the contractor.
Project start-up (D12)	
Client: an elaborate PSU in which we looked at the strengths of each participants and there corresponding IPM role to structure the Bouwteam tasks. Client: by doing a PSU you get more insight into each other personalities, which is important for starting a relationship.	The PSU was to get to know each other better.
Price negotiation phase	
Through an open cost estimate provided by the contractor we discussed the price for the construction of the project. There was some ambiguity about the maximum project budget. The contractor thought that if he would stay under this budget, he would still get the whole project budget, but this is not how it worked. The contractor had given large quantities and needed and asked more money than needed in the cost estimate. We calculated the quantities ourselves and found smaller quantities. This did not improve the collaborative relationship and made us a little suspicious for some time.	From the beginning we have been given a budget for the project which worked well, like expectations management. It gives the contractor an idea of how big the project is and wat solutions he should look for. Contractor: because the client was involved during the design process, he knew what we had done and understood how we came to a price based on an open budget. The involvement of the client in the design process prevents discussion during the price negotiations.
Construction phase	
For the contractor to get the construction job, he had to stay under the maximum budget set beforehand with the tender. Client: 'we lingered in the 'Bouwteam-way-of-work' longer than we thought we would'. According to the client, the more risk the project still has in the construction phase the more likely it is to continue the 'Bouwteam' in to the construction phase.	During the construction phase we still meet up every three weeks.
Opinion about the Bouwteam in general (A1,6 & G1,2)	
Client: 'I like this way of working, I would like to see more collaboration'.	Especially the openness of the communication was experienced as very positive.

Other comments	
Client: ‘It is important that you fit the project’. And ‘To create openness in a project you have to put yourself in a more vulnerable position’.	Contractor: ‘if it was possible I like to do just Bouwteams’.

Survey client and contractor	
Biggest difference between client and contractor	As can be seen in the table above, there are only small difference in option between the client and the contractor and both gave high scores in general. Even the biggest difference in score in a sub-criteria was only 1 point and both high gave a high score, the client gave a 5 and the contractor a 4.



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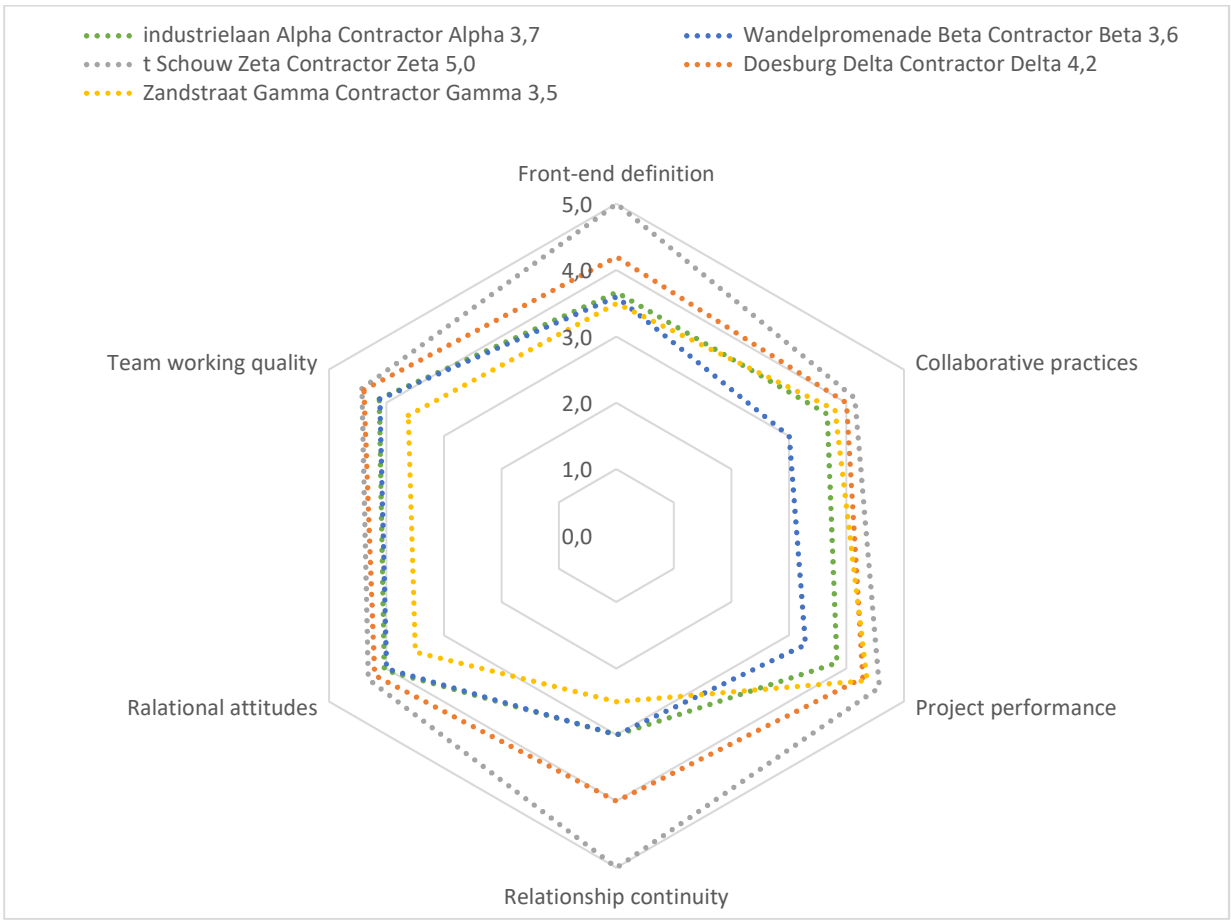
Collaborative practices
Project performance
Relationship continuity
Ralational attitudes
Team working quality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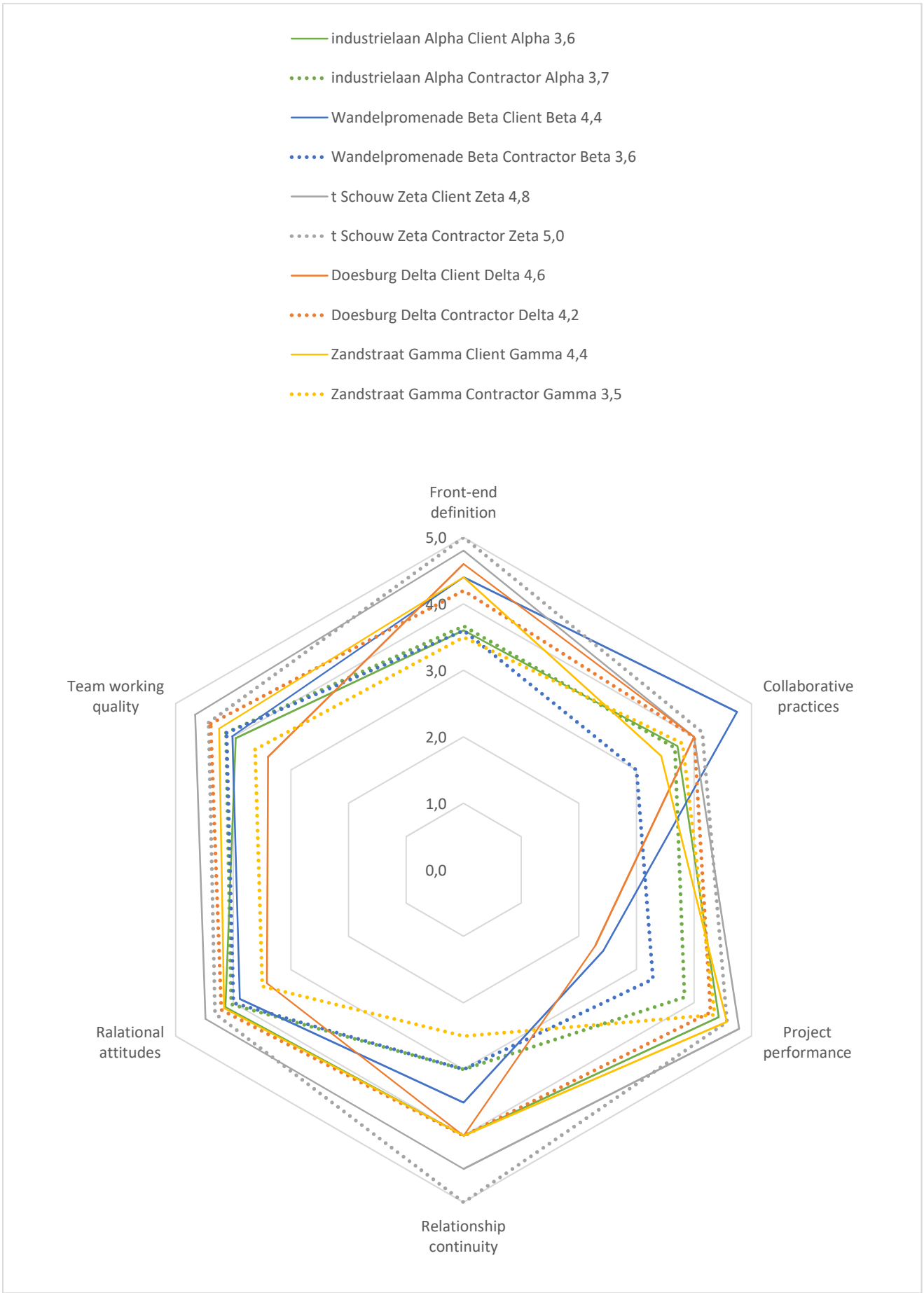
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Front-end definition
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Collaborative practices
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F. Expert meeting notes

In this appendix the transcript of the discussion during the expert meeting can be found. Per subject is shown what is said by the different experts (M, L and J), R stands for the researcher. At the end of this section the discussion about the statements can be found.

1. Reasons for Bouwteam

De redenen waarvoor een bouwteam worden gekozen hangen vaak samen.
M: Innovatie is ook een reden voor een Bouwteam.
L: Alle redenen die genoemd zijn bij dit punt zijn vaak gecombineerd van toepassing.
J: Een risico van het bouwteam is de valkuil van het traditionele denken.
M: Een bouwteam is zeer geschikt voor een complexe omgeving, ook qua stakeholders of achterban/politiek.
M: Als opdrachtgever zou je wel zelf moeten kunnen kaderen wat je wil.
J: De opdrachtgever moet zich professioneler gedragen en durven los laten, maar dat durven ze vaak niet en daarom kiezen ze maar voor een bouwteam. Dan weet je ook zeker dat de verantwoordelijkheid van de aannemer niet meer bij de opdrachtnemer komt en dat is niet het uitgangspunt.
J: Risico's delen is wel een goede reden om voor een bouwteam te kiezen.
J: Maar als de insteek is dat je zelf een ontwerpverantwoordelijkheid wil dragen en dat bij een aannemer wil weg zetten en dat met een bouwteam gaat oplossen. Dan weet ik zeker dan die verantwoordelijkheid niet bij de opdrachtnemer komt. Want opdrachtnemer gaat gedurende het bouwteam er alles op zetten om er voor te zorgen dat de opdrachtgever gaat bepalen hoe het gaat worden en zo de verantwoordelijkheid bij de opdrachtgever legt. Dat is ideaal want dan verdient hij meer en heeft de opdrachtnemer alle risico's van zich afgedrukt. En dan moet je kiezen voor een UAV-gc.

2. Procurement criteria

L: Je wil toch juist een beetje de soft skills beoordelen, dus hoe maak je die criteria dan hard?
R: Bijvoorbeeld bij de domtoren, dat je naar referentie en prestatieonderbouwingen vraagt van de aannemer i.p.v. naar hun opinie over samenwerking.
M: Prestatieonderbouwing vraag je dan na van de aannemer.
J: Referentie met klanttevredenheid erbij.
J: De selectie criteria die hier in de presentie genoemd worden vind ik zonde van het geld.
J: EMVI-criteria zijn er juist voor bedoelt om beter kwaliteit te krijgen dan dat je in eerste instantie had bedacht. Maar wanneer je focust op de samenwerking i.p.v. op het product, wat vaak gebeurt bij de selectie van een bouwteam, lukt het niet om een hogere kwaliteit voor het product vast te leggen aan de voorkant van het project.
J: Wat gek is, is dat de opdrachtgever geselecteerd wordt op het proces. De focus ligt ontzetten op de samenwerking en omdat het proces goed moet gaan lopen, verdwijnt de focus op het product compleet. En dat vind ik wel zorgelijk en zonde.
M: We zouden meer moeten focussen op de inhoud van het project.
L: Ja is dat wel zonde? Want het idee er achter is dat een goed bouwteam proces leidt tot een goed product. Of zelfs een beter product maar dat is natuurlijk moeilijk tastbaar te maken.
J: Niet een beter product dan dat je geëist hebt.
L: Kan wel, hoeft niet persé. Ik heb laatst een bouwteam gehad waarbij de aannemer toch wel met een paar goede oplossingen kwam die de opdrachtgever zelf niet bedacht zou hebben.
J: Maar is daar de prijs van het project niet mee om hoog gegaan?
L: Ja dat wel. Want de prijsvorming vond ook daarna pas plaats.
J: Het idee van de EMVI is nou juist dat je meer kwaliteit krijgt binnen je aanneemsom. Meer kwaliteit voor de zelfde prijs.
M: Ja maar dat is bij een bouwteam heel lastig te meten want die prijs is er nog niet. Dus ze kunnen wel hele goede beheersmaatregelen noemen maar als je niet weet wat het kost..

J: Ja dus dat is lastig.
L: Als er al een groot deel vast ligt is het logisch om dat deel al te laten afprijzen, ander wordt het lastig. Bij Bouwteams waar nog maar 30 % vaststaat kan je ook wel gaan afprijzen maar dat lokt ook alleen maar strategisch gedrag uit.

3. Price element
J: Daar ben ik het niet helemaal mee eens, maar wel in grote lijnen. Het is nog een beetje ongrijpbaar. Veel opdrachtgevers vinden het lastig om al een prijs te beoordelen wanneer er nog weinig vast staat.
M: Ik heb een project aanbesteed waarbij een wandelpromenade gerenoveerd moest worden maar de staat van deze promenade onbekend was. We hadden hiervoor een plafondbedrag meegegeven en vervolgens aanbesteed op kwaliteit vanuit de samenwerking. En nu komt er zo veel ellenden naar boven bij onderzoek naar de promenade dat de scope ongeveer is verdubbeld.
L: Is dat erg?
M: Nee dat is niet erg. Nu is de opdrachtgever nog (in de lead) betrokken en dan kunnen ze kijken wat ze wel en wat ze niet willen doen en hoe ze eventueel extra budget kunnen aanvragen.
J: Ik vind het voor een Bouwteam wel handig, om ook alle partijen die meedoen aan de aanbesteding een beetje de zelfde verwachting te geven, een budget te hebben waar uiteindelijk het project voor gerealiseerd moet worden om enigszins een richtlijn te hebben.
M: Dat je weet met wat voor een visie je moet kijken naar het probleem.
J: Ja dus geen prijselement vind ik totaal geen issue, want waar moet die aannemer dan mee rekenen, hij heeft dan totaal geen grip waar hij mee aan moet.
J: Een bedrag noemen geeft wel een idee van de aard en omvang. Dus ik vind het daarom wel heel relevant om prijs wel een rol te laten spelen.
M: Eigenlijk een soort prijs indicatie
L: Eenheidsprijzen vind ik altijd riskant en erg gevoelig voor strategisch inschrijven van de opdrachtnemer. De materialen die duur zijn en waar ze een lage prijs voor hebben gegeven poetsen ze dan wel uit het ontwerp weg en de materialen die in eerste instantie niet veel aan de orden zijn maar waar ze veel op kunnen verdienen komen dan opeens veel terug in het ontwerp.
M: Uiteindelijk zorgt de opdrachtnemer er dan toch wel voor dat je betaald wat ze willen hebben. Dus wij hebben het bouwteam eigenlijk al die eenheidsprijzen en uurtarieven en allemaal uitgehaald en een plafondbedrag meegegeven. En een maximaal budget voor de bouwteam fase.
J: Een opdrachtnemer gaat sowieso geld verdienen en heeft een bepaalde marge en ik vind dat je als opdrachtgever je daar niet mee moet bemoeien.
J: Het is veel belangrijker dat de opdrachtgever weet wat hij wil en weet wat hij er voor over heeft. Je moet als opdrachtgever je niet gaan afvragen wat een goede prijs is waar de markt ook nog een beetje aan kan verdienen. We moeten weten wat we willen, wat je er voor overhebt en daar mee gaan kijken wat het maximum is dat je er voor kan krijgen. En wat de opdrachtnemer er dan aan verdien is niet relevant voor mij. Die discussie over marges zou niet moeten plaats vinden.
L: In het proces is dit denk ik toch wel lastig. Het verschil met de consumenten markt is dat je makkelijker naar de concurrent gaan, en dat kan niet in een bouwteam.
J: En daar is bij een bouwteam de aanbesteding voor, om dat probleem op te lossen. Maar dat is lastig en zeker in een bouwteam.
J: Je wil zo veel mogelijk project voor de prijs, en dit vind je terug in de levensduur en niet in het bouwteamproces. Want een goed bouwproces geeft alleen maar zekerheid over dat wat ik wil hebben ook daadwerkelijk ga krijgen. En, ja hallo jongens, als je dat afspreekt dat je dat gaat krijgen moet je dat dan toch ook gewoon krijgen. Daar hoef je dan toch geen zekerheden voor af te spreken die ook miljoenen gaan kosten.
J: Dus geen staartkosten! Dat zit al in je eenheidsprijzen al in je prijs, dat is al geregeld.

J: Ik snap wel waar het vandaan komt om toch staartkosten te vragen. Want we komen uit een markt waarbij we zelf elk stukje van het project als lego steentjes berekenen en als losse deelprijzen hebben. En dan we dan heel erg op de laagste prijs gestuurd hebben per lego deeltje en waarbij we dan in de staartkosten geregeld hebben dat de aannemer ook nog wat mag verdienen. Dat wat oorspronkelijk het uitgangspunt, maar we zitten nu in 2019 en de markt is volwassener geworden en de opdrachtgever zegt nu ook, we kunnen niet meer op de legosteentjes onderhandelen, want daar hebben we de kennis niet meer voor. En ik zie ook dat als dit wel gebeurt, onderhandelen over de prijzen van de legosteentjes, dat we dan ontzettend veel ellenden krijgen. Terwijl je ook voor een totaal bedrag een opdracht kan laten doen en dat samen gaat kijken wat je er dan voor over hebt en iedereen gaat dan weer lachend naar huis, dat is mijn ervaring.
M: Begin je dan met 5 miljoen en door onderhandelingen kom je dan op 4.5 miljoen?
J: Ja zeker, zo kan dat echt werken.
L: Maar je hebt dan wel een soort schaduw begroting gemaakt om er wat over kunnen zeggen.
J: Ja.

4. Project start-up
J: Helemaal met je eens, maar je moet ook zeker inhoudelijke dingen bespreken in je PSU.
J: De vraag is dat hoe kwetsbaar stellen mensen zich op.
R: Dat komt langzaam tot staand en de PSU is een belangrijke eerste stap. Je moet je natuurlijk wel realiseren dan je hierna actief verder moet bouwen aan de onderlinge relatie.
J: Ja dit is natuurlijk de eerste stap, daar ben ik het wel mee eens.
L: Als je het project met een prijs hebt aanbesteed kan de aannemer tijdens de PSU als zitten met shit hoe gaat ik dit terug verdienen.
L: En dan kan je een hele gezellig PSU organiseren maar dat betekend niet dat het meteen allemaal goed zit, terwijl dat wel vaak gedacht wordt.
J: Ja hoe eerlijk ben je, al vanaf het begin.
J: Maar goed als je geen PSU doet dan zit het er sowieso. En nu met en PSU heb je de kans om een begin te maken aan het vertrouwen.
L: De aanbesteding is het ultieme element om het vertrouwen bij voorbaat al onmogelijk te maken.
J: Er is sowieso geen opdrachtgever die honderd procent vertrouwen heeft in de markt partij.

5. Tasks distribution and expectations
R: Als opdrachtgever heb je veel vrijheid om te kiezen hoeveel je zelf wil doen binnen het bouwteam en of je zelf de leiding wil of dat de deze bij de opdrachtgever neer legt.
R: Dit is prima, maar het moet wel duidelijk zijn wat er dan precies van de partijen wordt verwacht, ook omdat dit per bouwteam erg kan verschillen.
R: In praktijk is vaak te zien dat het helemaal niet duidelijk is wat er van elkaar verwacht wordt. Er ontstaan dan frustraties, bijvoorbeeld wanneer de ON zich denkt ingeschreven te hebben op een bouwteam en veel samenwerking verwacht, maar dat de OG dan maar heel weinig wil doen en alleen wat inspraak wil houden maar voor de rest alle taken bij de ON neerlegt.
L: Ja dit herken ik wel. Ik had een evaluatie van het bouwteam en toen kregen we te horen, ja we hadden hier en hier een actievere houding van jullie verwacht. Maar we hadden juist in de uitvraag dat aan de ander partij gevraagd, we dachten dat het er duidelijk stond maar nee dat hadden ze toch niet zo gelezen. En dan krijg je daar achteraf dus discussie over.
L: Dat heb ik nu met een nieuw bouwteam proberen te tackelen door een uitgebreide ranking tabel hebben bijgevoegd, per activiteit, met er bij genoemd wie die activiteit trekt, maar dat moet je weer op gaan passen dat je dat niet helemaal gaat dicht timmeren.
J: In een bouwteam zit je wel min of meer als gelijkwaardige partners. Je gaat samen dat project aan pakken. Als je dan een overeenkomst sluit voor de realisatie verander die rol wel, maar binnen de ontwerpfase heb je wel die gelijkwaardigheid.

J: Maar ik zie toch vaak binnen een bouwteam (in de ontwerpfase) de hiërarchische rol verdeling van opdrachtgever-opdrachtnemer terug, zoals we gewend zijn in de traditionele manier van werken. En ik vind eigenlijk dat die hiërarchische rol verdeling er niet zou moeten zijn, maar ja dat is theorie. In praktijk vinden de opdrachtgever zich boven de opdrachtnemer staan. En ik herken heel erg wat jij zegt, dat wanneer de opdrachtnemer de leider word voor het proces dat de opdrachtgever dan rustig achterover gaat leunen en het van de opdrachtnemer verwacht maar wel de beslissing wil maken, maar andersom ook. Om dit te doorbreken moet je de rollen goed definiëren.
J: Twee projectleiders vind ik een risico, want dan krijg je twee kapiteins op een schip.
J: In een project zijn we nu bezig met een Bouwmanager van het Bouwteam, die wordt door de opdrachtgever ingesteld, (dan kan je nog bediscussiëren of dat goed is, want wie betaald bepaald), maar de opdrachtgever zicht niet rechtstreeks in het bouwteam, wel een vertegenwoordiger.
R: Wie geeft de goedkeuring voor de beslissingen?
J: Ja.. beslissingen die gemaakt moeten worden en buiten de scope liggen moeten wel goedkeuring krijgen van de opdrachtgever.
J: Ik ben er ook nog niet helemaal uit. Maar ik ben aan het zoek naar hoe je de verhouding in het bouwteam zo gelijkwaardig mogelijk krijgt. Het voordeel we van de Bouwmanager is dat het een ingehuurde vertegenwoordiger is.
L: We hebben ook zo iets. Waarbij AG dan het proces managed, en als een soort second opinion kunnen helpen.
J:Ja ik heb nu zo'n rol, maar wordt wel betaald door de opdrachtgever, dus hoe afhankelijk ben ik.
M: Het blijft ook lastig omdat de opdrachtgever toch eindverantwoordelijker blijft en uiteindelijk wil dat zijn belangen goed behartigd worden.
J: Zijsprong: Bij RWS zetten ze soms de rollen in een cirkel en gaan ze er vanuit dat er niet één leider is binnen een project, dus op basis van gelijkwaardigheid.
L: Gelijkwaardigheid zegt niks over de takenverdeling, de ene kan als nog meer doen dan de andere, als je dat maar in gelijkwaardigheid overlegt.

6. Investing in collaboration
L: Ja dus erg belangrijk dat iedereen het zelfde denkt over de samenwerking.
J: Je moet wel eerlijk zijn.
M: Kan je niet doen dat je als EMVI moet vertellen wat je onder samenwerking verstaat en dan kies je de beste die bij jou eigen manier van samenwerking past.
J: Maar dan komen hier heel veel wollige tekst als antwoordt op.
J: De samenwerking komt pas goed tot recht als de aannemer gaat zeggen, ik heb met mijn directie afgesproken dat ik een marge van 10 procent moet halen maar op deze manier ga ik dat niet redden. Dat is pas eerlijk zijn, maar dat gebeurt helemaal nooit.
L: Ja dat gaat de ON dan toch stiekem via een paar ander manier oplossen ipv hier eerlijk over te zijn.
J: Ja die opdrachtgever snapt dan niet waarom de ON dan bijvoorbeeld een marge van 10% wil, 2% is in zijn ogen dan ook genoeg.
L: Maar je moet het hem gunnen om hem zo ver te krijgen dat hij zijn nek er voor uitsteekt.
J: Gunfactor is een hele belangrijke, dat geld naar elkaar. De opdrachtgever gunt dan een bepaalde marge, maar de opdrachtnemer moet dan de opdrachtgever ook wel wat gunnen.
R: Maar dit gaat dan over hoe aardig je iemand vind?
J: Ja nee. in belang van de samenwerking.
L: Ja hoe krijg je echt die openheid.
J: Deels cultuur, en je moet het faciliteren. Een goede PSU gericht op samenwerking, waarin je elkaars zorgen bespreekt is erg belangrijk. Het is makkelijk om samen te werken al het makkelijk gaat.
J: Maar als er veel conflicterende dingen samen komen wordt het moeilijker en is het erg belangrijk dat je eerlijk blijft en wat voor elkaar over hebt.
J: Met de PSU moet je dan de zaadjes planten.

J: Of misschien wel al bij de aanbesteding.
L: Ja misschien zou je en soort case/situatie willen voorleggen om ze te testen
J: De opdrachtgever verwacht van de opdrachtnemer dat ze goed willen samenwerken en eerlijk zijn. maar als je deze opdrachtgever vraagt: hoe eerlijk ben je zelf. Dan blijft het stil.
J: En die eerlijkheid begint al met de aanbesteding.
L: Je bouwteam begint al in de aanbesteding.
We doen nog best geheimzinnig tijdens de aanbesteden en bij het uitschrijven van een opdracht. De OG wil dan nog niet te veel prijs geven, niet te veel informatie want dan gaan ze te gelijke score hebben, maar eigenlijk begint dan je samenwerking al, en als je dan de ON al voor de gek houd…

7. Decision making
-

8. Openness and honesty
J: Mag ik nog iets toevoegen? Ga eens in een huis zitten met ze allen. Samenwerken op 1 plek, bij elkaar in het gebouw naast elkaar.
L: Ja het zijn soms maar kleine dingen, bijvoorbeeld bij een bouwteam bij het waterschap. Heb ik ze echt met moeite kunnen overtuigen om ook een keer op het kantoor van de opdrachtnemer te vergaderen i.p.v. altijd bij de opdrachtgever. Alleen al om te laten zien dat ze niet altijd bij de OG hoeven te komen. Toen ik dat voor de eerste keer zie tegen de OG keken ze me heel gek aan.
L: Ja maar echt, bij elkaar zitten, één koffiezetapparaat en 80% van de problemen zijn opgelost.
R: Samenwerken op basis van gelijkheid is erg belangrijk. De opdrachtgever denkt vaak dat hij niet daaraan hoeft te voldoen. Maar als de opdrachtgever zijn raming niet bloot wil stellen waarom zou de opdrachtnemer dat dan doen?
J: Ja, mee eens.
L: Ik merk het is nogal lastig om dit bij bepaald mensen tussen de oren te krijgen. Die zachte dingen bij een PSU hoeven, ook opdrachtgevers, niet te hebben. Ze willen meteen aan de slag.
J: Ja zal ze zo gaan doen dan gaat het niet goed, hier zitten ze dan niet op samenwerking te wachten, en moet je je afvragen of ze wel de juiste mensen bij de OG in het team hebben.

9: Price negotiations
J: Aan de ene kan is het zeker waar dat de concurrentie weg is op het moment dat de ze tot een prijs komen binnen een bouwteam en kan de ON misschien 5 % marge pakken i.p.v. 2 % die hij anders zou hebben moeten bieden wanneer een meer partijen een bood kunnen doen. Aan de ander kant is het zo dat de opdrachtgevers vaak wel heel veel en uiteindelijk is het budget te krap.
M: Maar soms denk ik dan, dat als je een hele fijne samenwerking in de ontwerpfase hebt gehad dan weet je bijna zeker dat je een goed samenwerking zal hebben in de uitvoeringsfase. Dus waarom hebben we dan niet wat extra geld over voor een proces dat soepel loopt.
L: Maar wat is iets meer
M: Ja dat weet je niet.
J: Een soepel verloop van een project levert al heel snel voor iedereen geld op. Maar overtuig iedereen daar maar eens van dat je sneller een succesvol project hebt als je investeert in samenwerken en daar vanaf het begin tijd in steekt.
R: Het is ook belangrijk dat je ook afspraken maakt over het uitbesteden van taken naar onderaannemers, anders worden hier risico’s weg gezet en zal de ON hier misschien op proberen te verdienen.
L: Of de ON knijpt dan de onderaannemer weer helemaal uit en verdienen er dan zelf op.

M: Maar vind je dat als OG erg? Als jij je eindresultaat behaald, en hoe dan die ON dat regelt dat is zijn zaak.
J: Nee, het komt dan vaak toch weer bij de OG terug. Zeker bij UAV-GC, dan zet de ON het weg bij de onderaannemer en dan wordt de aantoonbaarheid van het werk een probleem. En als de opdrachtnemer zijn onderaannemers uitknijpt weet je bijna zeker dat de producten ook onder druk komen te staan.
R: Wandelpromenade voorbeeld over de risico weg zetten bij de onderaannemer.
L: Als je ook in de offerte van de onderaannemer met marge hebt heeft het misschien minder zin voor de opdrachtnemer om dat nog weer voor een lagere prijs te kijken bij een ander onderaannemer.
J: Dus ook hier is die eerlijkheid en transparantie erg belangrijk. Het is hierbij belangrijk dat je vanaf het begin al ruimte geeft aan de ON om zijn belangen ook te kunnen behartigen en dan zal hij hopelijk ook meer ruimte geven aan onderaannemer. Hopelijk heb je dan de boeven al bij de aanbesteding er al uit gefilterd die daar dan misbruik van maken.

10: Construction
R: Goede uitvoering, weinig problemen en veel positieve punten. Hoe complexer de uitvoering hoe meer samenwerking we nog zien in de uitvoeringsfase.
J: Een grote valkuil is dat men terug valt in de traditionele rolverdeling.
J: Wanneer je voor een UAV-gc gaat bij een Bouwteam moet je heel erg oppassen dat je ON er niet voor zorgt dat je als OG de beslissingen maakt en zo de risico's gaat dragen. Want hier zijn ON erg goed in, in het afschuiven van de risico's.

11: Conclusions
Gezamenlijke planning:
J: En zet al je eigen en gezamenlijke punten op de planning.
L: Iedereen probeert maar wat met de selectie criteria, hebben wij als Antea Group ook goede opties?
J: Ja zeker. (..) dit zou ook op die website moeten komen: de bouwteam regisseur.

Statement 1
L: Ja krijg je dan niet twee kapiteins op één schip.
J: Ja ik denk dat je twee kanten op kan. Of gehele gelijkwaardigheid en elk team zijn eigen leider heeft maar wel in gelijkwaardigheid rond de tafel zit. En dat om dat proces te bewaken kan je iemand specifiek daar op zetten, maar de vraag is dan door wie die ene persoon dan betaald wordt, misschien wel door het bouwteam, hoe mooi is dat.
L: De proces begeleider zou dan ook vanaf het begin beide partijen goed kunnen aanpakken zodat het duidelijk wordt dat hij toch zo veel mogelijk onafhankelijk probeert te zijn.
M: maar het gaat er voornamelijk ook om wat de rol dan wordt van de projectleider is dan nog de vraag.
J: Ideaal zorgt elke partij er voor dat zijn eigen belangen worden behaald en dan kom je samen tot consensus en dan ga je door. Maar de praktijk is dat iedereen zo erg in zijn eigen kader blijft zo dat er geen consensus bereikt wordt en geen besluitvorming plaats vind. Dat is precies niet wat je wil van je moet wel een planning halen, en daarvoor het je eigenlijk een beslisser nog. Als je dan als nog twee beslissers hebt, een van de OG en van de ON dan werkt dat ook niet. Maar het is wel belangrijk dat iemand beslissingen neemt, maar wie is dat dan, dan is nog niet zo makkelijk.
Dat is zeker een aandachtspunt en misschien wel een punt dat je bij de PSU moet bespreken.
L: Is dan de conclusie dat het zeker iets is waar je aandacht voor moet hebben, maar of dan twee projectleiders de oplossing is niet helemaal juist.
M: Onafhankelijke procesbegeleider die kan kijken of iedereen nog wel bezig is om het doel te bereiken.
L: Geld natuurlijk voor opdrachtnemer maar ook voor opdrachtgever.

Statement 2
J: Ja ik denkt dat dat wel handig is, zeker nu we nog in de lerende fase zitten en onervaren mensen betrokken zijn kan een procesleider het bouwteam dan in goede banen sturen.
L: Het moet wel onderdeel zijn van. Naast die persoon moet het contract er ook naar zijn en goede bodem hebben voor samenwerking.
L: Bij een bouwteam hebben we nu ook een wederzijdse evaluatie een keer in de maand om het proces bespreekbaar te maken.

Statement 3
M: Je hebt qua prijs wel een soort kader nodig om ergens naar toe te kunnen werken.
J: Ja je moet wel iets van een budget hebben om te voorkomen dat het ontwerp straks te duur is. Wel is dan de vraag of je als OG het totale budget prijsgeld of hier wat van achter houd, of misschien zegt dat je wat achterhoud.
L: Ik vind hier dat het VG bouw bouwteam model je de verkeerde kant op wijst. Omdat ze hier eerst helemaal het ontwerp proces doorlopen en dan als ware de prijsvorming als nieuwe fase introduceren wanneer het ontwerp is afgerond. En dan kom je er achter dat het te duur is. Dus het is wel belangrijk om eerder ook te kijken naar de prijs.
M: Vaak worden de keuze toch ook gedaan op basis van de financiën.
M: De totale openheid van de raming. Als jij als OG aan het begin je hele raming prijs geeft dan misschien het creatieve oplossingsgerichte denk proces van de opdrachtnemer wordt afgeremd, omdat hij al een oplossing zit in die raming van de OG en daar dan snel genoegen mee neemt.
M: En dus geen ander oplossing meer gaat voordragen dan dat hij in de raming ziet staan.
L,J: Dan dat denk ik ook.
R: Maar ze hebben het wel vaak over een open begroten.
J: Bij een UAV wel, dan is het onder deel van je bestek. Bij design en construct zou ik het niet doen.

Statement 4
Hier hadden we het al over gehad.
L: Dus een uitgebreide PSU en met een follow up.

End:
J: Leuk de manier waarop je het deed, zetten tot na denken.
L: Ik denk dat iedereen net zo veel geleerd heeft als jij, dusse goed gedaan.
M: Ja goed gedaan.

G. Bouwteam Vision (Antea Group)

The Antea Group vision can be found by following the link:
https://www.anteagroup.nl/nl/diensten/contractering/bouwteam
Here you find the adaptations made to the Antea Group Bouwteam vision:

- ➔ All text in black is from the original vision and used in the new version.
- ➔ All text in red is from the original vision and deleted.
- ➔ All text in green is added based on the findings of this study.

BOUWTEAM VISIE; SAMENWERKEN, OPEN COMMUNICATIE EN TIJDIG BIJSTUREN

Bouwteams zijn helemaal terug van weggeweest. Steeds meer opdrachtgevers zien de voordelen van Bouwteams in en zetten bouwteamprojecten op de markt. In veel gevallen worden hiervoor oude bouwteamcontracten als basis gebruikt. Worden de voordelen van een bouwteam wel optimaal benut? Antea Group ontwikkelde een aanpak waarmee het bouwteam voldoet aan de wereld van vandaag.

WAT IS EEN BOUWTEAM?
Een bouwteam is een contractvorm waarin opdrachtgever, aannemer, en in sommige gevallen ingenieursbureau en architect, nauw samenwerken. Om uiteindelijk te komen tot een, door alle partijen gedragen, ontwerp en overeenkomst voor de uitvoering.

In een bouwteamproject onderscheiden we ~~vier~~ drie fasen:

1. **Aanbesteding**: in de aanbestedingsfase voor een bouwteam ga je als opdrachtgever op zoek naar de ideale partners voor je bouwteam.
2. **Ontwerp**: in de ontwerpfase werken opdrachtgever en aannemer en/of architect en ingenieursbureau gezamenlijk het ontwerp uit voor het project.
    - **Prijsvorming**: ~~in de prijsvormingsfase wordt de prijs voor het project vastgesteld en de uitvoeringsovereenkomst gesloten.~~ De prijsvorming is een belangrijk onderdeel van de ontwerpfase die parallel loopt met de ontwikkelingen van het ontwerp.
3. **Uitvoering**: in de uitvoeringsfase wordt het project fysiek gerealiseerd.

WAAROM KIEZEN VOOR EEN BOUWTEAM?
Er kunnen meerdere voordelen zijn om te kiezen voor een bouwteam. Drie voordelen springen er uit, omdat ze echt afwijken van andere contractvormen:

- Benutten van kennis van de partij die het werk ook gaat uitvoeren tijdens de ontwerpfase.
- Als opdrachtgever sturend kunnen optreden in de ontwerpfase.
- In lijn met de nieuwe **marktvisie**: als opdrachtgever écht samenwerken met de markt en in dit kader open communiceren over eisen, wensen en de verdeling van risico's, taken en verantwoordelijkheden.

WAT ZIJN DE SUCCESVOORWAARDEN?
Alle bouwteams hebben één ding gemeen; het vereist samenwerking tussen opdrachtgever en opdrachtnemer. En is een bouwteam een garantie voor een succesvol project? Nee, dat zeker niet. Om te komen tot een succesvol bouwteam dient voldaan te worden aan een ~~7~~10-tal succesvoorwaarden.

1. **Maatwerk.** Elk project is uniek en heeft haar specifieke behoeftes. Breng deze in kaart, leg ze vast en bepaal wat je in de bouwteamovereenkomst moet regelen en zorg er voor dat dit open en eerlijk gecommuniceerd wordt in de tenderdocument.

2. ~~**Denk vooruit.** Denk al in de ontwerpfase na over de uitvoeringsfase. Hoe ga je de constructieve samenwerking uit de ontwerpfase doorzetten tijdens de uitvoeringsfase.~~ (komt terug in het nieuwe punt > Doorlooptijd.)
3. **Taakverdeling.** Draag zorg voor een heldere taakverdeling. Schep in de bouwteamovereenkomst duidelijkheid in de verwachtingen en bespreek deze zodat alle deelnemers op één lijn zitten.
4. **De beste partner.** Een bouwteam vraagt om een partner die samen wil en samen kan werken met de opdrachtgever. ~~Een bouwteam vraagt een partner welke het vermogen heeft om zich te kunnen verplaatsen in de opdrachtgever en haar behoeftes.~~ De juiste selectie criteria op stellen voor de selectie van een geschikte partner is erg belangrijk en zorg dat hier voor de juiste kennis in huis is.
5. **Samenwerking.** De selectie van de juiste partner is nog maar het begin, een goed samenwerking opbouwen en onderhouden is vervolgens even belangrijk. Vergader regelmatig of werk samen aan het project op de zelfde locatie zodat er vertrouwen tussen de deelnemers opgebouwd kan worden.
6. **Project start-up:** Maak gebruik van een project start-up waarin de deelnemers elkaar beter kunnen leren kennen en de samenwerking een kick-start kan krijgen. Bespreek verwachtingen, definieer samenwerking, maak afspraken en stel iemand aan die alle deelnemers aan deze afspraken houd.
7. **Traceerbaarheid.** Leg gemaakte keuzes vast. In een bouwteam moet je diverse keuzes maken met betrekking tot ontwerp en uitvoering. Het zorgvuldig maken en vastleggen van keuzes verkleint de kans op verkeerde keuzes of aannames en vergroot de duidelijkheid over wie daarvoor verantwoordelijk was.
8. **Doorlooptijd.** Voor een soepel verloop van het Bouwteam is het van belang dat iedereen op de hoogte is en weet wanneer wat verwacht wordt. Stel samen met alle Bouwteam deelnemers een gezamenlijke planning waarin alle project gerelateerde acties, deadline en beslissingsmomenten in opgenomen zijn, zodat de benodigde informatie en personen op de juiste momenten aanwezig zijn.
9. **Openheid.** Stimuleer openheid in prijs. Gedurende het ontwerpproces ontstaat er een steeds concreter beeld van de prijs voor het werk. Voorkom verrassingen tijdens de prijsvormingsfase en bespreek kosten dan ook regelmatig met elkaar parallel aan de ontwerp ontwikkelingen.
10. **Evaluatie.** Stimuleer überhaupt openheid in het Bouwteam. Openheid over prijs, taken, planning, haalbaarheid, verwachtingen en zorg er voor dat de goede maar ook de minder goede ontwikkelingen altijd bespreekbaar zijn.
    1. Maak gebruik van een standaard evaluatiepunt op de agenda van de vergaderingen.
    2. Om meningsverschillen over de samenwerking aan het licht te brengen en bespreekbaar te maken kan men gebruik maken van de RECAP tool.
11. **In control.** Als opdrachtgever blijf je eindverantwoordelijk voor het project. Niemand anders dan jij kan het beste inschatten wat ervoor nodig is om het project tot een succes te maken.

~~Door over deze vraagstukken na te denken~~ Door de succesfactoren te gebruiken, zorg je voor duidelijkheid binnen het bouwteam, een efficiënte aanpak en de ideale werkomgeving voor een succesvol resultaat!