Public Version

RELATIONSHIP CONTRACTING ARRANGEMENTS

A study of relationship contracting arrangements and their ability to foster best-for-project behaviour in infrastructure projects in the Netherlands

Robert Stam | July 2016




TU Delft

Rijkswaterstaat
Ministry of Infrastructure and the Environment

Relationship Contracting Arrangements

A study of relationship contracting arrangements and their ability to foster best-for-project behaviour in infrastructure projects in the Netherlands

Date	July 2016

Personal Details

Name	Robert Stam
Student number	1223216
Email address	robertstam@gmail.com robert.stam@rws.nl

Graduation Committee

Chairman	Prof.dr.ir. M.J.C.M. Hertogh
First supervisor	Ir. Leon Hombergen
Second supervisor	Ir. J.S.J. Koolwijk
Supervisor Rijkswaterstaat	Ir. A.J.Th. de Bruijne

Delft University of Technology
Civil Engineering & Geosciences
Construction Management & Engineering (CME)

Rijkswaterstaat
Afdeling Markt en Innovatie

Photos and image sources front cover, from left to right:

- Sluiskiltunnel (Bam Infra)
- A2 Hooggelegen (Rijkswaterstaat)
- Alliantie Amstelspoor (Edward Bary)
- International Criminal Court (Architectenweb)

PREFACE

With this master thesis I am concluding my master Construction Management & Engineering (CME) at the Delft University of Technology.

A couple of years ago I learned of a construction project in which client and contractors collaborated closely to achieve savings and reinvest those savings to increase the overall sustainability of the project. I remember thinking this was an excellent idea and a great example. Only at the start of this research did I realise that this project had in fact much resemblance to a project alliance: project partners collaborating for a common goal and sharing in the risks and rewards of a project. I still very much support this philosophy and hope to see more projects being realised in a similar fashion.

I started working on this thesis with project alliances as the topic of interest but soon widened the scope to include other relationship contracting arrangements as well and gradually started to use behaviour as an angle. Although I very much enjoyed taking a different perspective, I was also somewhat in over my head. Behaviour is not a topic that we in the construction industry are used to discussing. Therefore to investigate the role of contracts and specific contract clauses for behaviour turned out to be more difficult than I had initially anticipated. Nonetheless, I am pleased to say that I think this research has revealed a number of interesting aspects which surpass the formality of construction contracts. I hope it will inspire others to do follow-up research as I believe much more is to be gained.

This research would not have been possible without the support of a number of people.

First of all I would like to thank my graduation committee for their very helpful comments and many interesting discussions. Thank you all for your interest, enthusiasm, and lively discussions during the past 8 months. Thank you Marcel for your challenging comments, Leon for your continuously positive support and encouraging me to be more positive towards my own work, Jelle for your help in getting a grasp on the concept of behaviour and in being firm on the methodological approach, and Arnoud for your extensive support and trust during the research.

I am very grateful to Rijkswaterstaat for offering me the chance to perform my research within the company and to my colleagues at Innovatie and Markt for a very enjoyable time. I would also like to thank all interviewees for their input and reflection on my research.

Finally I would also very much like to thank my family for supporting me in the completion of this second master studies and second graduation project. Don't worry, this time I'm done for real.

Robert Stam

Delft, July 2016

SUMMARY

A current issue in construction industry is the often adversarial behaviour between client and contractor in construction projects, leading to poor project performance. Relationship contracting arrangements such as project partnering and project alliancing are expected to yield better performance through facilitating behaviour which is beneficial for project performance: best-for-project behaviour. But there is no clear definition of 'best-for-project behaviour', nor is it clear how this behaviour can be achieved through application of contracts. Furthermore there is confusion concerning the terminology used when discussing alliances and partnering which makes it unclear what the contract forms entail and how they compare to one another. Therefore this research investigates which behaviour is beneficial to project performance, which governing mechanisms should be part of a contract in order to foster this behaviour, and which categories of relationship contracting arrangements are capable of fostering this behaviour. It therefore provides an answer to the following main research question: *Which categories of relationship contracting arrangements are able to foster best-for-project behaviour between client and contractor in infrastructure projects in the Netherlands?*

BEST-FOR-PROJECT BEHAVIOUR

First the goal of relationship contracting arrangements is investigated in Chapter 3. What exactly is best-for-project behaviour and how does it influence project performance?

Through literature research on the behaviour of effective teams the following definition of best-for-project behaviour is established. Best-for-project behaviour is: *Collaboration in service of the project: acting in good faith, with respect for each other, subordinating individual interests to those of the project,* ***supporting*** *and* ***pro-actively informing*** *each other, by communicating clearly, providing openness of information and intentions,* ***being critical*** *towards our work and that of our colleagues, and quickly resolving problems.*

This behaviour is beneficial for project performance since it improves the flow of information, the efficiency of (decision making) processes related to problem solving and risk management and the quality of those decisions, and reduces monitoring costs. It also reduces costs related to conflict resolution and litigation. People can focus on their tasks and the issues at hand without being distracted. This increases the efficiency of the construction process, i.e. reduction in time and costs. Through providing the proper conditions the team is able to handle any situation or problem in the best possible way.

It is also investigated how the contract can contribute to achieve this best-for-project behaviour. A contract can impose limitations on an individual's perceived freedom to perform a specific action, for instance through a monitoring or reporting system, or a penalty system. The opposite is also possible. Through rewarding certain behaviour it becomes a more attractive choice for an individual to adopt. In addition it is found that contracts can influence part of the aspects which are identified as facilitators of effective teams by defining clear project goals, establishing clear roles and responsibilities, establishing an organisation which fosters equality, having performance evaluation, and an incentive scheme.

GOVERNING MECHANISMS TO FOSTER BEST-FOR-PROJECT BEHAVIOUR

Through literature study of four complementary contracting theories (principal-agent theory, stewardship theory, relational contract theory, and transaction cost economics) it is investigated which elements should be part of a construction contract. The theories offer different perspectives and address various issues related to contracting. The four theories are divided into two perspectives. The transactional perspective (principal-agent theory and transaction cost economics) identifies opportunism as a primary concern which needs to be addressed by aligning interests through remuneration and implementing monitoring systems to detect undesirable behaviour. The relational perspective (stewardship theory and relational contract theory) on the other hand states there is less or even no need for formal governing mechanisms. Instead relational governing mechanisms are introduced to manage the relation between parties and ensure their continuance despite any (inevitable) changes or conflicts which may occur.

A number of governing mechanisms are found. These are aggregated into either formal or relational governing mechanisms. The first consist of formal rules, procedures, and policies aimed at enforcing control, at limiting the opportunities and incentives to deviate from what was agreed on. Relational contract governing mechanisms focus more on the development and maintenance of the relation between different parties through the inclusion of norms and values and codes of conduct, and use of collaborative practices (e.g. team building, or project start-ups) in order to ensure continuance of the relation.

By combining the formal and relational governing mechanisms with the facilitators of effective teams, the following list of parameters is composed in Chapter 5. These are the elements to be addressed by a contract:

- Context and goals: description of the parties involved; explication of interest of project and parties; description of goals of project, agreement, and parties; putting goals of the project first.
- Interaction: inclusion of norms and values; mutual liability waiver; mutual early warning.
- Organisation structure: joint management team; duties and obligations; joint decision making; pre-agreed conflict resolution methods.
- Remuneration: payment; incentive structure; sharing of pain and gain.
- Monitoring & control: performance measurement and KPIs; transparency & openness.
- Flexibility: change procedures; exit agreement.

Whether these parameters, or contract clauses, have a direct relation with (aspects of) best-for-project behaviour is determined in chapter 7.

VARIOUS KINDS OF RELATIONSHIP CONTRACTING ARRANGEMENTS

In Chapter 6 a number of relationship contracting arrangements is studied and compared using the above list of parameters in order to find their key characteristics. An overview of the contract models and their key characteristics is provided in the table below. There are two exceptions in this list. The Dutch UAC-IC 2005 (Uniform Administrative Conditions for Integrated Contracts) is not a relational contracting arrangement but is discussed as a baseline for the Dutch construction industry. The Swedish Samverkan is not a project delivery mechanism but instead offers a structured method to implement non-contractual project partnering. It illustrates an alternative route to achieve partnering benefits within an existing framework of contract models.

Overview of relationship contracting arrangements and their key characteristics.

Contract model	Key characteristics
UAC-IC 2005 (baseline)	**Formal contract** ▪ Incentives (option)
Project partnering contracts ▪ PPC2000 ▪ JCT-CE ▪ NEC3 ECC + X12	**Contractually embed partnering principles** ▪ Explicit obligation to collaborate ▪ Mutual early warning obligation ▪ Various options (joing management and decision making, incentives, sharing of pain and gain) to support more extensive collaboration and become alliance contracts.
Project alliancing contracts ▪ Australian (pure) project alliance ▪ Integrated Project Delivery (IPD)	**Comprehensive, integrated approach** ▪ Sharing of pain and gain (Australian project alliance), sharing of gain (IPD) ▪ Set of alliance principles ▪ Joint management team and unanimous decision making ▪ Mutual liability waiver
▪ Project design alliance	**Comprehensive, integrated approach for design phase only** ▪ Limited scope for sharing of pain and gain ▪ Set of alliance principles ▪ Joint management team and unanimous decision making
▪ Mini-alliance	**Additional clause as part of a standard D&C contract** ▪ Sharing of pain and gain for a small number of risks/optimisations
Samverkan	**Non-contractual project partnering approach** ▪ Joint management team and joint risk management ▪ Joint goal setting ▪ Conflict resolution methods ▪ Continuously monitoring project performance ▪ Transparency concerning common matters
Design team	**Early contractor involvement during design phase** ▪ Joint consultative project team ▪ Liability waiver concerning contribution of ideas

THE RELATION BETWEEN CONTRACT CLAUSES AND BEST-FOR-PROJECT BEHAVIOUR

In order to find a potential relation between specific contract clauses and specific aspects of best-for-project behaviour, four cases in which relationship contracting arrangements were applied, are studied in Chapter 7. These cases consist of the Sluiskiltunnel (UAC-IC 2005), Alliantie Amstelspoor (project alliance), International Criminal Court (NEC3) and A2 Hooggelegen (project alliance). The cases are studied using interviews supplemented with existing literature on the cases.

The results of these cases reveal a relation between a number of contract clauses and specific aspects of best-for-project behaviour:

- **Sharing of pain and gain** (in the form of an alliance fund or target price contract) was found to be primarily useful for achieving optimisations in projects (*having a critical attitude*

(search for and propose improvements / optimisations; reflecting on outcome & processes)). It also leads to *pro-actively informing* (informing other party of any issues that may impede realisation of project goals; voicing opinion & offering ideas) and *supporting* (providing help & requesting help) in order to achieve lower costs.

- **Incentives** primarily function by bringing focus to the project, aligning the areas which are of primary importance to the client to the financial interest of the contractor. Whether the incentives are achieved is measured through establishing a system of KPIs. This results in the behaviour of addressing each other on issues related to those KPIs (*having a critical attitude* (reflecting on outcome & processes)), and *supporting* (monitoring & correcting errors - providing constructive feedback; providing help & requesting help).
- **Inclusion of norms and values** was found to lead to *supporting* (co-construction of meaning), *providing openness* (providing full openness on areas necessary for realisation of project goals), *having a critical attitude* (reflecting on outcome & processes; search for and propose improvements / optimisations) and *respect and value each other* (respect each other's interests).
- The **Mutual early warning** mechanism in NEC3 contracts was found to stimulate the behaviour of *pro-actively informing* each other of any problems (informing the other party of any issues that may impede realisation of project goals, voicing opinion), *supporting* each other in addressing those problems (co-construction of meaning), *having a critical attitude in* monitoring for errors (reflecting on outcome and processes; analysing errors), and *quickly resolving problems*.

In addition, a number of other factors are suggested to also be of importance for influencing behaviour: the role of leadership in setting an example of the desirable behaviour and in continuously paying attention to achieving behavioural change, the application of various collaborative practices to develop and maintain relations and facilitate interaction (project start-up, project follow-up, co-location, formal and informal meetings to discuss cooperation, tools to measure collaboration), and last but not least having a project team with the right attitude who are willing and capable of operating according to the project philosophy and contractual obligations.

ANALYSIS OF RELATIONSHIP CONTRACTING ARRANGEMENTS

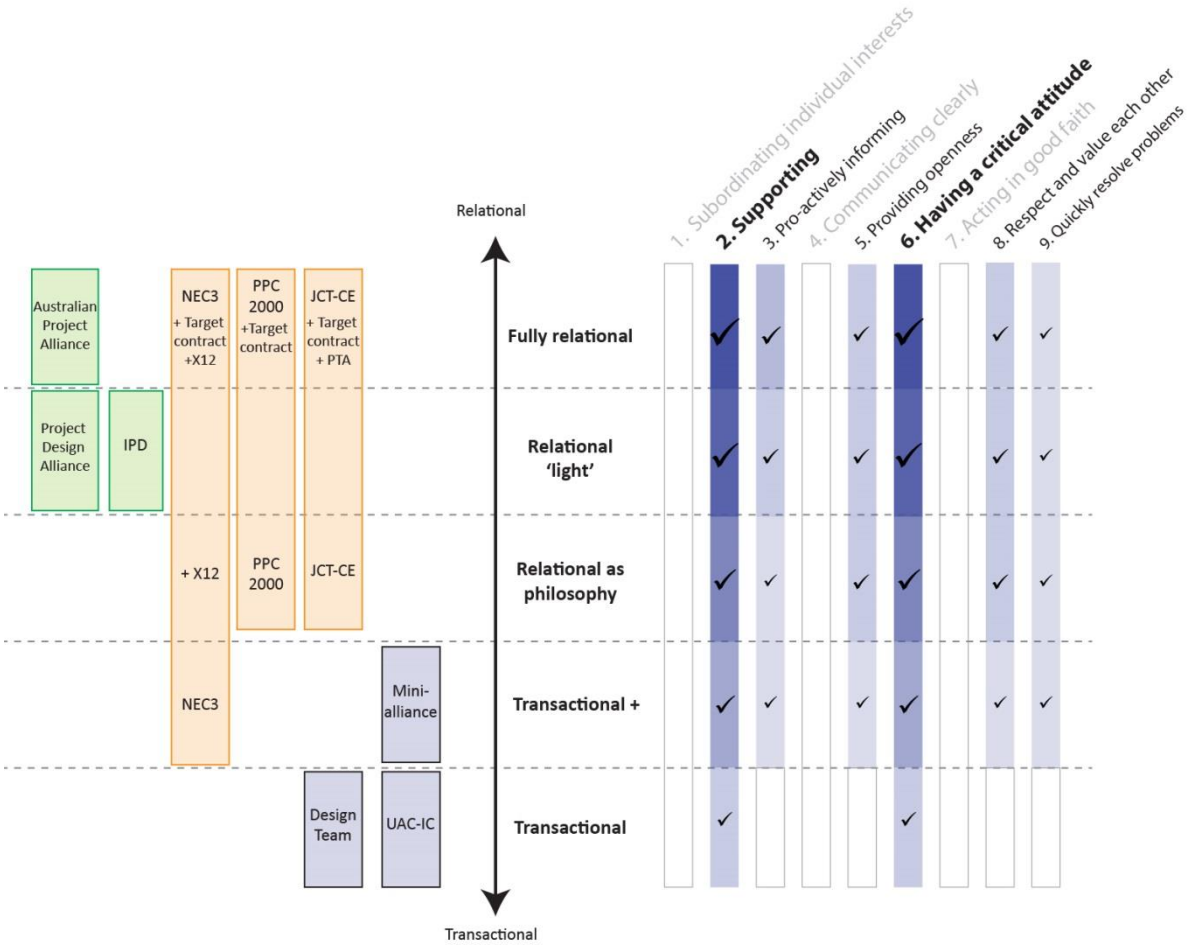
Based on these four specific contract clauses a further analysis of the relationship contracting arrangements is made in Chapter 9. The relationship contracting arrangements are divided into three groups, based on the extent to which they address these relevant contract clauses.

1. The first group includes the UAC-IC 2005, Design Team and mini-alliance. These contract models do not address almost any of the relevant contract clauses. Only the UAC-IC 2005 possesses a (restricted) option for adding incentives.
2. The second group includes the partnering contracts NEC3, PPC2000 and JCT-CE contracts which do cover most of the relevant contract clauses but primarily as an option.
3. The third group covers the project alliance contracts, Project Design Alliance, IPD, and Australian Project Alliance. These also address most of the relevant contract clauses but now as a standard element of the contract models.

The project alliances thus offer a complete package and most guidance concerning relational aspects. However, the partnering contracts can be extended through various options to become project alliances as well.

CATEGORISATION AND CONCLUSION

Finally in Chapter 9, the categorisation is made. Relationship contracting arrangements with a combination of sharing of pain and gain, an incentive structure, mutual early warning and inclusion of norms and values are best able to foster best-for-project behaviour. This corresponds to the categories of 'fully relational' (Australian project alliance, NEC3 C/D + X12, PPC 2000 target contract, JCT-CE target contract + PTA) and 'Relational 'light'' (Project Design Alliance and IPD). The third category, 'relational as philosophy', however also is capable of fostering the desired behaviour albeit to a slightly lesser extent. This category is not covered by any of the Dutch contract models.



Categorisation of relationship contracting arrangements and the aspects of best-for-project behaviour they foster.

These relationship contracting arrangements are a stimulus to the occurrence of best-for-project behaviour. However, no guarantees can be given. Instead it also depends on the way the project team uses such a model and whether they have an intrinsic motivation to exhibit best-for-project behaviour. In addition there are other aspects that are important for fostering best-for-project behaviour: having the right project team, leadership, and applying collaborative practices.

SPECIAL THANKS TO THE INTERVIEWEES

Christiaan Caan	ProRail
Paul Fondse	Brink Groep
Michel Langhout	BAM
Melanie Nissink	Rijkswaterstaat
Henrico Plantinga	ProRail
Peter Storm	Kennis & Co
Arjan Visser	CROW
Ton Vrijdag	BV KKS
Freek Wermer	Rijkswaterstaat
Piet Zuidgeest	BAM

TABLE OF CONTENTS

TABLE OF FIGURES

LIST OF TABLES

PART I
INTRODUCTION & RESEARCH DESIGN

Chapter 1: Introduction to the research topic

Chapter 2: Research Design

1. INTRODUCTION TO THE RESEARCH TOPIC

1.1 ADVERSARIAL RELATIONS IN TRADITIONAL AND INTEGRATED CONTRACTS

Poor project performance is a common issue in infrastructure projects. Cost and time overruns are a major concern (see e.g. Chen, Zhang, Xie, & Jin, 2012; Suprapto, 2016, p. i; Walker, Harley, & Mills, 2015). Traditional contracting, in which design, construction, fabrication of products and maintenance are separated, can have a negative influence on teamwork and cooperation in projects due to the resulting adversarial relationships between parties (Lahdenperä, 2012; Lloyd-walker, Mills, & Walker, 2014; Love, Mistry, & Davis, 2010). Another cause for adversarial relationships is the strict risk divisions in traditional and in integrated contracts such as Design & Construct (Laan, Voordijk, & Dewulf, 2011; Sakal, 2005; Tang, Duffield, & Young, 2006).

Distrust plays an important role in traditional contracts and opportunism of all parties (i.e. client, main contractor, and subcontractor) is to be anticipated (Laan et al., 2011; Lahdenperä, 2012). Competitive tendering, especially in a poor economic climate, forces parties to reduce profit margins which has a detrimental effect on relations between parties and consequently on project performance (Laan et al., 2011). Parties in infrastructure projects are focused on protecting their own interests, managing the risk-exposure of their organisation and are less concerned with collaboration to the benefit of the project (Lloyd-walker et al., 2014; Sakal, 2005). The focus thus lies on what is 'best for self', instead of what is 'best for project'. Since both parties require each other to complete the project, this attitude is questionable, see Figure 1. Improved collaboration between client and contractor is necessary to improve project performance (Suprapto, 2016, p. i).

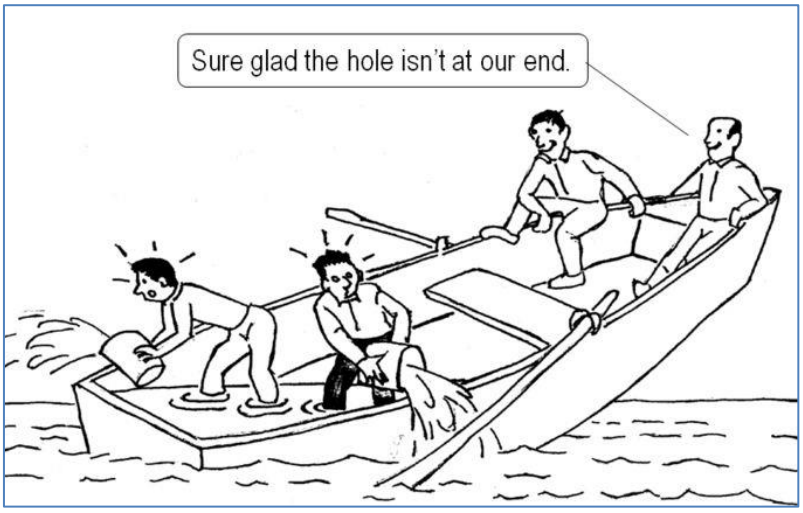


Figure 1: A characterisation of adversarial behaviour in construction industry.
Image source: https://media.licdn.com/mpr/mpr/p/1/005/086/3a3/3486744.jpg

Meanwhile, construction projects are becoming increasingly complex and dynamic (Anvuur & Kumaraswamy, 2007; Chao-Duivis et al., 2007; Sakal, 2005). The manner of collaboration under traditional contracts is insufficient to handle this increased complexity (Chao-Duivis et al., 2007). Furthermore, most traditional contracts and integrated contracts such as Design & Construct are not flexible and actually consider change as something undesirable (Sakal, 2005). These contracts thus cannot cope with changing circumstances and are unable to foster the collaborative atmosphere

required to successfully deal with the uncertainties present in a complex project (Chao-Duivis et al., 2007; Laan et al., 2011; Sakal, 2005). Hence a different approach is necessary.

1.2 RELATIONSHIP CONTRACTING ARRANGEMENTS AS POTENTIAL SOLUTION

Relationship contracting is a high-level concept that takes a different approach to contracting. By itself it is not a project delivery mechanism, such as Design & Construct or Design Build Finance Maintain (DBFM), but a collection of different project delivery mechanisms that emphasises the importance of the relations between contractual parties. These mechanisms are all founded on the relational contracting philosophy. According to this philosophy, the desire of parties to maintain relations is the prime motivator to fulfil agreements. Principles of relationship contracting offer more flexibility, enable team-building, and make it easier to maintain long-term relations. These principles form the basis for relationship contracting arrangements such as partnering, alliancing, joint ventures, and other arrangements aimed at fostering collaboration (Kamminga, 2009).

According to the Queensland Government Chief Procurement Office (2008, p. 7) the principles of relationship contracting include:

- "A focus on project outcomes
- innovative contractual arrangements
- success of projects measured against key performance indices
- an emphasis on openness and communication between participants
- an equitable risk/reward balance that aligns the commercial interests of the parties.
- access to and contribution by the best resources of each participant with an emphasis on working together efficiently".

Relationship contracting arrangements, with its relationship-based approach, are presented as a solution for resolving the adversarial relationships that so often occur between client and contractor in infrastructure construction projects (Laan et al., 2011; Sakal, 2005). The term relationship contracting arrangements covers a number of approaches and contract forms that share the same philosophy. For instance, Chan, Chan, and Yeung (2010) consider project partnering, strategic partnering, project alliancing, strategic alliancing, public private partnerships, and joint ventures to be applications of relationship contracting arrangements, and Lahdenperä (2012) also considers integrated project delivery (IPD) to be part of this list.
Project Alliancing is a contract type that has been the focus of academic research, albeit only in a select number of countries (Chen et al., 2012). Application of project alliancing in Australia has shown a lot of positive results (Walker et al., 2015), and other arrangements such as Project Partnering and Integrated Project Delivery, have also reported beneficial results (Tang et al., 2006). Kamminga (2009) warns that these positive results are often reported by advocates of these types of arrangements, but nonetheless also concludes that in general these types of arrangements do improve collaboration in projects.

In the Netherlands, relationship contracting arrangements have only seen limited application. Project partnering is not being applied in a structured way and only a small number of projects have been executed over the past twenty years under the label of project alliances. These projects include a regional road, the N201, and a number of projects by ProRail (e.g. Waardse Alliantie, and OV SAAL). The only project alliance currently completed by Rijkswaterstaat is A2 Hooggelegen, while two more projects are considered to be tendered as alliances. In general, the results in the Netherlands have

been positive as well. Despite these positive experiences, alliances are not common practice in the Netherlands and apart from the few projects being executed the construction industry in the Netherlands is still largely unfamiliar with this contract type. Other relationship contracting arrangements are not under structured investigation either.

The research being described in this thesis will aid in furthering the knowledge concerning relationship contracting arrangements.

1.3 REPORT STRUCTURE

This chapter contained the introduction of the research. Chapter 2 contains an elaboration of the research design for this thesis and includes the problem definition, research questions, scope, methodology, and societal and scientific relevance of this study.

Part 2 contains the literature study on best-for-project behaviour and theories on contracting. First chapter 3 will investigate best-for-project behaviour, its role for project performance, and how it can be facilitated. Next chapter 4 will discuss four theories on contracting, Principal-Agent theory, Stewardship theory, Relational Contract theory, and Transaction Cost Economics. This discussion will result in a set of parameters in chapter 5 which will be used to analyse the contracts later in this thesis.

Part 3 concerns relationship contracting arrangements in practice. Chapter 6 investigates and compares various relationship contracting arrangements. Chapter 7 discusses the results of the case studies concerning four applications of relationship contracting arrangements in the Netherlands, the Sluiskiltunnel, Alliantie Amstelspoor, International Criminal Court, and A2 Hooggelegen, in order to determine the relation between specific contract clauses and specific behaviour. Based on the results, the most relevant contract clauses for fostering best-for-project relations are determined.

Part 4 contains two chapters in which the results from the previous chapters are combined and a final analysis of the relationship contracting arrangements is provided. Chapter 8 lists the key contract clauses and provides a typology of relationship contracting arrangements. Based on this typology the relationship contracting arrangements which were discussed in chapter 6 are analysed and categorised.

Part 5 consists of the final four chapters. Chapter 10 provides a discussion of the results of this thesis. The final conclusions and answers to the research questions are drawn in chapter 11. A number of recommendations for Rijkswaterstaat and recommendations for further research are given in chapter 12, and finally a reflection of the thesis is provided in chapter 13.

2. RESEARCH DESIGN

The previous chapter introduced the context and topic of this thesis: relationship contracting arrangements as a potential solution for the adversarial relations in the construction sector.

This chapter will describe the research approach which has been taken in this thesis. It will first outline the problem definition, followed by the formulation of the main objective of the research. Chapter 2.3 and 2.4 will introduce the main research question and the sub questions respectively. The scope for this thesis is delineated in chapter 2.5 after which the methodology is described. Finally this chapter concludes with a description of the societal and scientific relevance.

2.1 PROBLEM DEFINITION

Ultimately the goal of project alliances and other relationship contracting arrangements is to foster a more collaborative atmosphere which enables best-for-project behaviour. It can be regarded as part of a general search for ways to prevent or counteract the adversarial relationships that occur under Design & Construct contracts and solve the "need for better integration, cooperation and coordination of construction project teams" (Cicmil & Marshall, 2005, p. 524).

However, two issues occur here. First of all, 'best-for-project behaviour' is a diffuse term that needs further clarification. What kind of behaviour is associated with best-for-project behaviour? Or in other words, what do relationship contracting arrangements aim to accomplish? And how can contracts enable this behaviour?

Secondly, there is no common interpretation of the term alliancing (Chen et al., 2012; Lahdenperä, 2012; Walker et al., 2015) and of partnering (Anvuur & Kumaraswamy, 2007), there are other approaches such as project partnering and integrated project delivery that share similar features, and there are multiple variations of these other approaches (Lahdenperä, 2012), and of project alliances (Plantinga & Dorée, 2013). There has not yet been a comprehensive analysis and comparison of available forms and their various applications.

In conclusion, the problem investigated in this thesis is twofold.

1) It is unclear what 'best-for-project behaviour' is, i.e. which behaviour is beneficial for project performance and how this behaviour can be achieved through application of contracts.
2) There is no common understanding concerning the content of relationship contracting arrangements. Therefore it is unclear which kind(s) of contracting arrangements are able to achieve best-for-project behaviour.

2.2 OBJECTIVES

Therefore In order to be able to identify which relationship contracting arrangements are potentially worthwhile for practitioners to employ in practice, it is necessary to

1) Determine which behaviour is beneficial for project performance, and determine how this behaviour can be achieved;
2) Determine the elements and governing mechanisms necessary to foster best-for-project behaviour in complex infrastructure projects, using theories on contracting and experiences from practice, and based on that assess whether forms of project alliances and other relationship contracting arrangements possess those aspects;
3) Make a structured categorisation of the various relationship contracting arrangements, concerning their ability to foster best-for-project behaviour.

2.3 RESEARCH QUESTION

Application of relationship contracting arrangements is a means to diminish adversarial relationships in construction projects and instead foster best-for-project behaviour. It is thought that this will result in better project performance.

Due to the multiplicity of forms it is unclear which forms are worthwhile to investigate or whether there are other options which have not yet been determined. Theories on contracting – Transaction-Cost Economics, Principal-Agent Theory, Stewardship Theory, and Relational Contracting Theory – help to explain why contracts exist, explain behaviour of contracting parties, and indicate governing mechanisms to steer behaviour. Therefore these theories can be used to establish which elements and governing mechanisms a contract form must contain in order to foster the desired best-for-project behaviour. Based on these theories an assessment of relationship contracting arrangements can be made.

Hence the main question is defined as follows:

Which categories of relationship contracting arrangements are able to foster best-for-project behaviour between client and contractor in infrastructure projects in the Netherlands?

2.4 SUB QUESTIONS

The main question is split up in several sub questions, which correspond to the steps that have to be taken to answer the main research question.

During the research, specific attention will be paid to project alliances since it has already been identified as an organisational form that is specifically intended to overcome the adversarial relationships and has often been applied in a number of countries, including the Netherlands.

1. What is best-for-project behaviour and how does it influence project performance?

2. Which typical elements and governing mechanisms in the contract are important in fostering best-for-project behaviour, according to theories on contracting (Principal-Agent theory,

Stewardship theory, Relational Contract Theory, Transaction Cost Economics)?

3. Which kinds of relationship contracting arrangements can be discerned in literature and practice, and what are their key characteristics?

4. How do practitioners regard the influence of the contract on best-for-project behaviour?

5. To what extent are the necessary elements and governing mechanics embedded in the various kinds of relationship contracting arrangements?

2.5 SCOPE

This section describes the boundaries of the thesis: what will be included and omitted in this thesis, due to the limited time available.

The thesis will include

- A discussion of socio-psychological theories on best-for-project behaviour: collaboration, learning, and team-related performance factors.
- A description and assessment of different relationship contracting arrangements including but not limited to project alliances, project partnering, integrated project delivery.
- Since the principal (e.g., Rijkswaterstaat) is the organisation that selects the project procurement form to be used for a specific project, the perspective for this thesis is primarily that of the principal. For the same reason, this thesis will only concern the client-contractor relations, not contractor-contractor or contractor-subcontractor relations.
- This thesis will regard international perspectives during the literature search, but interviews will be limited to the Netherlands. The conclusions for this research will therefore in part be based on the Dutch context.

The thesis will not include

- Since the focus of this thesis lies with relationship contracting arrangements as potential solution for poor *project* performance, this thesis will only consider the *project* perspective and disregard long-term agreements, such as strategic/knowledge alliances, strategic partnering, and joint-ventures, which are also not possible for governments to employ under EU legislation.
- A full investigation into project performance of the different forms, under specific project contexts will not be performed. An indication will be given based on literature, case studies, and interviews. A thorough investigation falls outside the scope, but is a likely follow-up research.
- Co-creation can in practice be included in the same group as project alliances. It is currently a buzzword in the industry for which everyone has an own interpretation. Although it does have some overlapping elements, it is not regarded here as a relationship contracting arrangement and will thus not be discussed.

  Co-creation is viewed for this thesis as a philosophy which focuses primarily on interaction between actors in the construction process in developing a solution that fits client and contractor. The best chances for this co-developing occur in the procurement phase which is

where co-creation has its prime focus. It therefore advocates early contractor involvement, and also incorporates the consumer. Co-creation is not necessarily aimed at fostering collaboration and reducing adversarial behaviour. Hence the scope of co-creation is more limited, and does not provide comment on e.g. dealing with risk division, responsibilities, or conflict resolution. Furthermore, co-creation is not a project delivery mechanism (Vis, 2015).

- The procurement process is expected to have an influence on behaviour in the project as well. Important decisions are taken during procurement that set the stage for the realisation of the project. A number of aspects including responsibilities, powers, remuneration are established during the procurement phase. Additionally there is a tendency towards earlier involvement of the contractor. For Rijkswaterstaat the competitive dialogue is often used to obtain an assessment of the feasibility of the project before the project is tendered and work on the design has commenced. The interaction during the procurement phase lays the foundation for behaviour during the project. Due to the limited time available, the procurement process will largely be disregarded here as well.
- The importance of having the right team members for a project has also been mentioned as an important factor for the success of a construction project (Van Wassenaer, 2010). Selection of staff and selection of personnel is not a primary aspect, but will be addressed to a limited extent in the interviews and conclusions.

2.6 METHODOLOGY

Figure 2 depicts the steps that will be taken in order to find an answer to the research questions. An explanation of each step is given below.

1. Best-for-project behaviour

   Behaviour in a project setting can be regarded on an inter-organisational and interpersonal level (Bygballe, Jahre, & Swärd, 2010). This thesis focuses on the inter-organisational level where contractual arrangements between client and contractor play an important role. However, the individual level is also relevant. Therefore this level will be investigated here in order to provide some understanding of behaviour of individuals, before focusing on the project team setting.

   This will provide an answer to sub question 1: *What is best-for-project behaviour and how does it influence project performance?*

2. Contracting theories

   Using a number of well-known theories which explain the nature of contracting, the incentives and behaviours that play a role in a project setting, as well as the governing mechanisms that can be employed to steer behaviour will be explored.

   This will answer sub question 4: *Which typical elements and governing mechanisms in the contract are important in fostering best-for-project behaviour, according to theories on contracting (Principal-Agent theory, Stewardship theory, Relational Contract Theory, Transaction Cost Economics)?*

3. Relationship contracting arrangements

   Aims to find a variety of relationship contracting arrangements which are used in practice and find their main characteristics.

This step will provide an answer to sub question 3: *Which kinds of relationship contracting arrangements can be discerned in literature and practice, and what are their key characteristics?*

Interview protocol

As a preparation of step 4, an interview protocol will be established based on the results of the literature research (steps 1-3). This will establish knowledge that still has to be gained from interviews and helps to structure the interviews to be conducted.

4. Case studies & interviews

This step includes interviews with practitioners from a selection of cases in order to identify which parameters they identify as being important for fostering (aspects of) best-for-project behaviour. This will result in an adjusted list of necessary parameters.

It thereby addresses sub-question 4: *How do practitioners regard the influence of the contract on best-for-project behaviour?*

5. Synthesis: Assess & classify

In this final step the relationship contracting arrangements found in step 3 will be analysed using the list of relevant parameters which resulted from step 4. The result is a matrix of forms and elements/governing mechanisms. By combining similar forms in this matrix, a further classification will be made.

This step will answer sub question 5: *To what extent are the necessary elements and governing mechanics embedded in the various kinds of relationship contracting arrangements?*

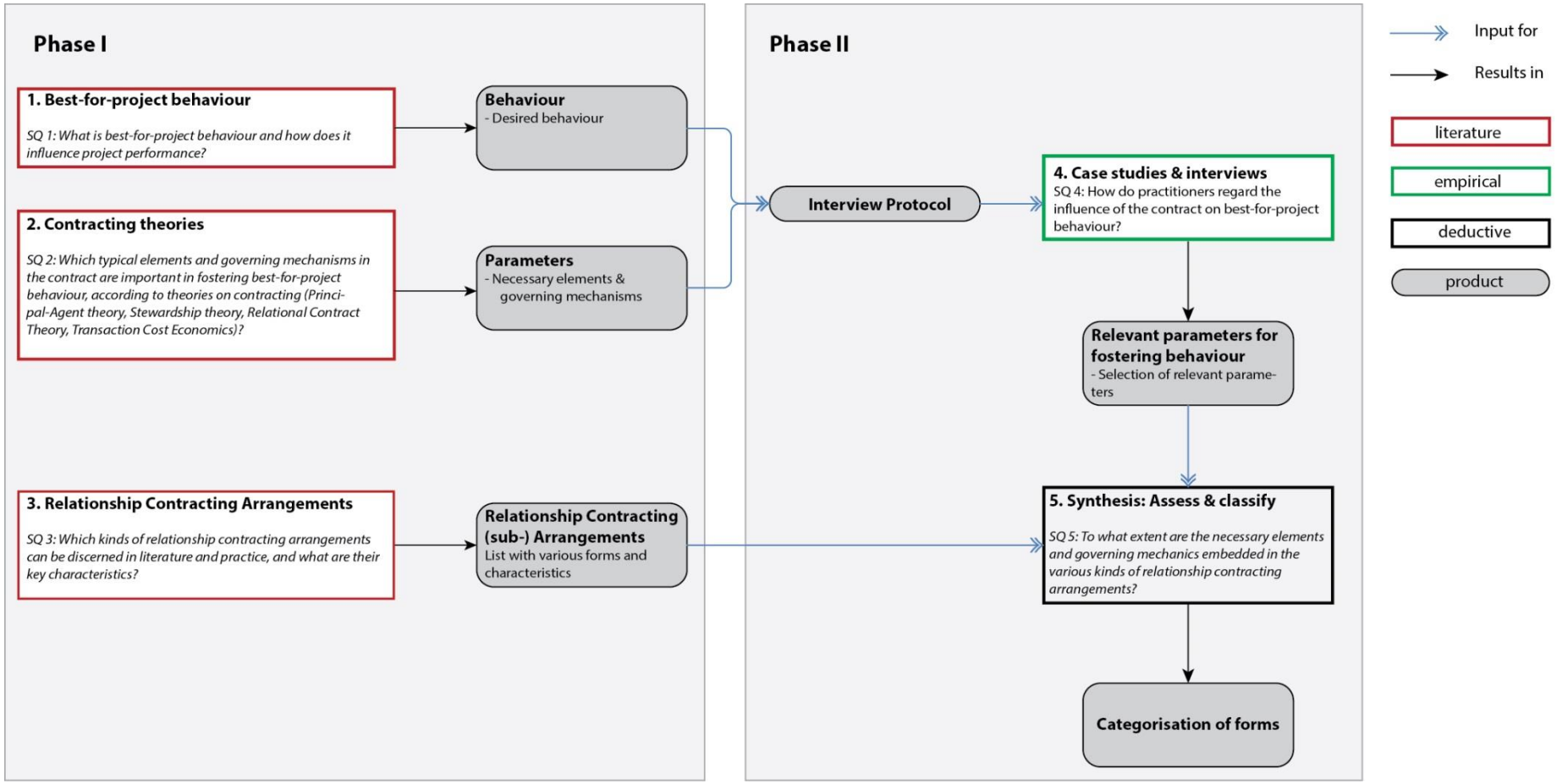


Figure 2: Methodology

2.7 INTERVIEW SETUP

2.7.1 Goals of interviews

The primary goal of the interviews is to gain more information on whether contractual clauses have had a direct influence on the behaviour exhibited within the projects.

2.7.2 Selection of projects

Table 1 gives an overview of projects in the Netherlands that have a strong focus on cooperation or behaviour. These include in particular project alliances but also a few projects that have been indicated by Rijkswaterstaat colleagues to emphasise cooperation. In order to be able to gather sufficient information about behaviour during project execution, the project should either still be in progress or should have recently finished so those involved can still accurately recall the behaviour exhibited by parties in the project.

Of the projects below, the likely candidates are the 2 projects of OV SAAL WALTZ and Amstelspoor, A2 Hooggelegen[1], Sluiskiltunnel, A2 Maastricht, and International Criminal Court. Due to the limited time available, a further selection has been made by selecting projects from different clients and different contractors.

Hence the following projects have been selected (in bold in Table 1): A2 Hooggelegen, OV SAAL Amstelspoor, Sluiskiltunnel, International Criminal Court.

Table 1: Overview of potential projects

Project	Contract period	Client	Contractor	Researched
Waardse Alliantie (Project alliance (PA))	2000-2003	ProRail	HBSC (Heijmans, Boskalis, Strukton, CFE)	-
N201+ (PA)	2006-2013	Province of Noord Holland	Heijmans-Boskalis and Siemens	-
Bataafse Alliantie (PA)	2007-2010	ProRail	CH4 (Mobilis, DFE Nederland en KWS Infra)	-
A2 Hooggelegen (PA)	2008-2012	Rijkswaterstaat	Trajectum Novum (Mourik, Boskalis, VHB, KWS, Vialis)	Case study
OV SAAL: WALTZ (PA)	2010-2016	ProRail	WALTZ (VolkerWessels)	-
OV SAAL: Amstelspoor (PA)	2010-2016	ProRail	Alliantie Amstelspoor (BAM)	Case study
A2 Maastricht (D&C)	2010-2016	Projectbureau A2 Maastricht (Rijkswaterstaat, municipality of Maastricht, municipality of Meerssen, province of Limburg)	Avenue2 (Ballast Nedam, Strukton)	-
Sluiskiltunnel (D&C)	2011-2015	Province of Zeeland	CBT (BAM, TBI)	Case study

[1] Despite being completed in 2012, those involved are still called upon to tell their story. In addition, the project is well-documented through an extensive book publication.

International Criminal Court (NEC3 E&C)	2012-2015	ICC	Courtys (Visser & Smit Bouw and Boele & van Eesteren (VolkerWessels))	Case study
Markermeerdijken (PA)	2016-2021	Hoogheemraadschap Hollands Noorder-kwartier (HHNK)	Boskalis, KWS, VHB	-
Knooppunt Hoevelaken (PD&C)	2016-2024	Rijkswaterstaat	Combinatie A1|28 (BAM, Van Oord)	-
Getijdecentrale Brouwersdam (PA)	2016-2020	Province of Zuid-Holland, Province of Zeeland, Rijkswaterstaat, municipality Goeree-Overflakkee, municipality of Schouwen-Duiveland.	N/A	-

2.7.3 Selection of interviewees

The interviewees, see Table 2, are selected from these cases on the basis of their role within the project. For each project one candidate of the client and one candidate of the contractor is selected. For projects where the client's project manager was not involved in writing the contract, a contract or tender manager was also interviewed.

In the following subchapters where the results of the interviews are discussed, their project and role are abbreviated as indicated in the third column.

Table 2: Overview of interviewed project participants.

Project	Role	Abbrev.	Organisation
OV SAAL: Amstelspoor	Alliance manager	AM AA	ProRail
	Technical manager	TM AA	BAM
	Tender Manager	TDM AA	ProRail
Sluiskiltunnel	Project Director	PD SK	KKS B.V.
	Project Manager	PM SK	Combinatie BAM TBI (CBT)
International criminal court	Project Director	PD ICC	International Criminal Court (ICC)
A2 Hooggelegen	Environmental Manager	EM A2H	Rijkswaterstaat

Additionally, a few external experts were interviewed who are knowledgeable about various contract forms and on behaviour in projects, see Table 3.

Table 3: Overview of interviewed external experts.

Expertise	Abbrev.	Name
Contract Expert on UAC-IC	CE	CROW
Expert on behaviour in projects	EB	Kennis & Co

2.7.4 Method of conducting interviews

The interviews are conducted as semi-structured interviews. A number of questions were drafted in the form of an interview protocol (see Appendix A). For each interview this protocol was then slightly

adjusted to the person in question, e.g. the question on project philosophy was only asked to the client's project manager/tender manager, not to the contractor's project manager.

While conducting the interviews the protocol was mainly used as a guide for the topics to be discussed and not always followed sequentially. The conclusions and transcripts were sent to the interviewees for verification.

The interview transcripts are coded in Atlas.ti using the coding scheme which can be found in Appendix B, to identify when behaviour, contract clauses and collaborative practices were mentioned. The instances in which interviewees mentioned a direct connection between contract clauses and specific behaviour are listed in Appendix E[2].

2.8 SOCIETAL AND SCIENTIFIC RELEVANCE

Poor project performance with cost and time overruns are unfortunately almost a common occurrence for large public infrastructure projects (Chen et al., 2012; Flyvbjerg, Skamris Holm, & Buhl, 2003; Walker et al., 2015). No one is really surprised when it is reported that a project is delayed or is facing costs exceeding budget. However, this is obviously not a desirable situation, as also stated by the director general of Rijkswaterstaat (Rijkswaterstaat, 2015), who stated to be dissatisfied with the current results of projects, both in terms of costs, time, and quality, as well as the often resulting adversarial relation between the parties. A similar statement is also expressed in the recent Marktvisie (2016), but the necessity for better collaboration was also expressed by signing the Directive Collaboration Rijkswaterstaat-Market in Integral Projects (Dutch: Richtlijn Samenwerking Rijkswaterstaat-Markt op Integrale Projecten) (Vernieuwing Bouw, 2010). Investigation of relationship contracting arrangements that are intended to foster better relationships can help Rijkswaterstaat and other public clients to select or update their procurement forms in order to work towards more collaboration with their project partners and ultimately achieve better project performance.

This research will aid in establishing a better overview and categorisation of the various forms of relationship contracting arrangements and project alliances. In the words of Walker and Lloyd-Walker (2012, p. 878): "It would be useful if a fundamental framework of dimensions describing expected project team behaviours could be developed that provide an improved way of helping us understand what is expected of teams and reasons why one procurement form may be suitably deployed over another. Such a framework could help us better understand similarities and differences with procurement choice labels used around the globe."

It thereby lays the foundation for further research in a next phase into the performance of various forms in order to identify the suitability of the different forms under specific circumstances.

[2] Omitted in the public version of this report.

PART II
LITERATURE STUDY

Chapter 3: Best-for-Project Behaviour

Chapter 4: Theories on Contracting

3. BEST-FOR-PROJECT BEHAVIOUR

Relational contracts are said to achieve better project performance through facilitating best-for-project behaviour. As stated in the problem definition, there is no clear definition of best-for-project behaviour. Hence it is unclear what exactly these relational contracts are aiming to achieve.

Therefore this chapter explores what best-for-project behaviour entails, or in other words, which behaviour is desirable in a construction project. Additionally, it will be investigated how the contract can influence behaviour in the first place.

Although this thesis primarily discusses contracts, behaviour is a key concept in this thesis. The theories and contract types being discussed later on in this thesis all aim to influence the behaviour of the contracting parties. This reflects on the interaction between them. Furthermore, in a project setting people have to interact with each other in order to realise project goals, and the contract itself is executed by people. Hence behaviour has a pivotal role in achieving project goals.
Unfortunately behaviour is also a difficult concept and there exist different models and theories that try to explain how behaviour is established and how to adjust an individual's behaviour. Much is still unknown regarding this topic. Even so, an elaboration of behaviour is provided here in order to gain a better understanding and to answer the first sub question:

What is best-for-project behaviour and how does it influence project performance?

The next section explains how behaviour in general is determined and how behaviour can be influenced. This is done in order to determine how behaviour in a project context can be steered. Next, it will be explained how behaviour influences project performance. Chapter 3.3 then elaborates on best-for-project behaviour, i.e. which behaviour is beneficial for project success. Finally the potential contribution of contracts in enabling this best-for-project behaviour is investigated.

In order to establish that, it will be investigated how behaviour is established in general, how this behaviour can be influenced, that is which determinants play a role in behaviour? Next it will be investigated which behaviour is beneficial for project success, resulting in a definition of best-for-project behaviour (chapter 3.3). Finally the potential contribution of contracts in enabling this behaviour is investigated.

3.1 UNDERSTANDING BEHAVIOUR

Much research has been performed to try to understand the factors that determine human behaviour in a given situation and to predict behavioural responses. If we know how behaviour comes about, or in other words what the determinants of behaviour are, we can also try to influence an individual's behaviour. However, there is not yet a full understanding of this phenomenon and as a consequence different theories and models exist. One of the prime models, the theory of planned behaviour, will be explained in this chapter, but its shortcomings will also be described here.

The theory of planned behaviour, developed by Ajzen, is one of the most popular models to explain an individual's behaviour. It aims to predict behaviour in a specific context. Ajzen's model (see Figure 3) states that behaviour is determined in two steps. Behaviour is a consequence of two factors, *intention* and *perceived behaviour control*. Intention itself is determined through three factors, *attitude toward the behaviour*, the *subjective norm*, and (again) *perceived behaviour control*.

3.1.1 Predicting behaviour

There are two factors which influence behaviour: a person's *intentions* and his *perceived behavioural control*. "Intentions are assumed to capture the motivational factors that influence a behavior; they are indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior" (Ajzen, 1991, p. 181). However, this intention can be restricted by other factors that influence whether or not someone is free to decide to perform, such as time, money, cooperation of others, and skills. How people perceive this restriction is called the perceived behavioural control. Whether people think they can fulfil their intention determines how hard they will try, or in other words if they believe they will be successful they are more likely to persevere than if they doubt their own abilities.

Intentions and perceived behavioural control are predictors of behaviour, but they are not always equally important. If a person has complete control over a situation his intention is the most important, whereas if he has low control the perceived behavioural control might become more relevant. While this reasoning makes sense on a conceptual level, Ajzen was unable to find a strong correlation in practice. Hence the connection between perceived behavioural control and the actual behaviour remains unverified (Ajzen, 1991).

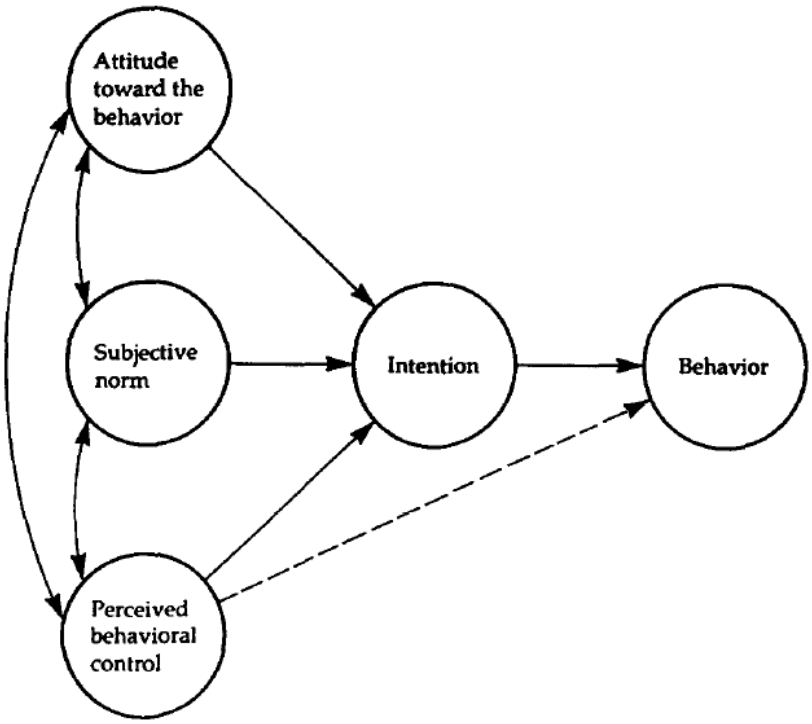


Figure 3: **The model of the theory of planned behaviour. The dashed line between perceived behavioural control and behaviour indicates the anticipated but empirically still unverified nature of the connection. Image source: Ajzen (1991, p. 182).**

3.1.2 Predicting intention

Intention is influenced by attitude towards the behaviour, subjective norm, and perceived behavioural control. The attitude is the "degree to which a person has a favourable or unfavourable evaluation or appraisal of the behaviour in question" (Ajzen, 1991, p. 188). Subjective norm is the "perceived social pressure to perform or not to perform the behaviour" (Ajzen, 1991, p. 188). Group norms push a person towards conforming since people have an intrinsic desire to belong to a group. Although this desire is higher in collectivist cultures it is still present in individualistic cultures

(Robbins & Judge, p.282). Therefore people will be influenced by social norms.
In general, a positive attitude, favourable subjective norms, and favourable perceived behavioural control, will positively influence an individual's intention to perform the behaviour under consideration (Ajzen, 1991). The discussion of agency theory and stewardship theory (see Chapter 4) also refers to a certain attitude or propensity people have when entering a relationship with another party.

3.1.3 Influencing behaviour

Ajzen's model thus indicates important determinants of behaviour. Therefore changes in behaviour can potentially be achieved by influencing each of the factors in the model: intention, perceived behavioural control, attitude toward the behaviour, and subjective norms (Ajzen, 1991). Contracts also influence these factors, for instance with the implementation of control mechanisms. If someone's attitude is to behave opportunistically but there are control mechanisms in place to check his level of performance, his intention may be curbed by this perception; i.e. he will not feel free to execute his intention to behave opportunistically.

Unfortunately, the model of Ajzen can only predict about 30% of behavioural variation. Therefore other factors are also of importance. Lechner (2007) affirms that Ajzen's model is a good starting point but also gives an overview of other determinants of behaviour from the context of changing unhealthy behaviour such as smoking, unhealthy diets, and lack of exercise. Although this entails a different field of study, the aspects she identifies do seem relevant to the topic in question here, i.e. identifying the determinants of behaviour.

The first determinant concerns the openness to change. People need to be open to information regarding the consequences of their behaviour. This requires an awareness of their behaviour and why it may or may not be beneficial. This is an essential step to enable change, but is by itself insufficient to accomplish change (Lechner, 2007). A project manager that does not see the relevance of improving cooperation is not willing to change his behaviour.

The second determinant is the environment. This is composed of four different types, the physical, socio-cultural, economic, and political. The *physical environment* refers to the physical presence or absence of products that can influence behaviour, e.g. having healthy food in the cafeteria, or being able to cycle to work (Lechner, 2007). This element seems less applicable in the case of achieving better cooperation in construction projects, but perhaps co-location could be a relevant facilitator. The *socio-cultural environment* concerns the socio-cultural context within which behaviour is performed. This can be in the form of pressure or support from other people (i.e. the *objective* social norm, as opposed to the subjective norm above), but also one's social network (Lechner, 2007). For construction projects this could for instance be interpreted as the support from upper management in implementing a different approach, but also support of one's direct colleagues.
The third aspect consists of the *economic environment* such as one's income and the cost of products or services. Healthier food can for instance be more expensive (Lechner, 2007). In the construction industry the influence of the economic crisis and resulting financial problems for construction firms can also influence the intention to behave cooperatively, and investing in additional processes to enable more cooperative behaviour can also be costly.
Finally the *political environment* concerns the rules and regulations that enable or disable specific behaviour (Lechner, 2007). For the construction industry we could think of rules concerning safety,

but also European legislation concerning public procurement. The contract for a construction project can also be considered to be part of the political environment as it enables or disables certain processes that influence behaviour.
These four types of environment can influence an individual on different levels, the direct personal environment (micro level) such as family and workplace, the meso-level which is aimed at providing a context that promotes or discourages certain behaviour, and thirdly the macro level, the general political systems where e.g. economic policy decisions are taken and cultural norms and values are shaped. Much is still unknown about how the environmental determinants influence behaviour. More importantly, the environment is often difficult to change. However, the *perception* of the environment can also be changed through promotion of positive behaviour (Lechner, 2007).

Finally, much of our behaviour is not rational, but exists of habits and automated responses. Conscious consideration does not play a role here. These habits are simply automated behavioural responses that an individual has learned to apply as a reaction to certain stimuli. Changing one's behaviour requires learning to change these automated responses (Lechner, 2007).

An approach for changing adversarial behaviour into cooperative behaviour (or best-for-project behaviour, see below) will thus require different steps. Changing the environment itself by removing elements that lead to adversarial behaviour such as procurement through lowest bid as well as changing the perception of the environment by promoting positive examples of cooperative behaviour. It also includes the creation of awareness of other possibilities, meaning promotion of the possibility to use Relationship Contracting Arrangements and/or tools or processes to enhance cooperation. Changing the automated responses (related to distrust) will require constant attention and will be a process of years. Despite the current awareness of the need to change at the higher levels of the client and contractor organisations, of which the Marktvisie (2016) is a significant example, this awareness should also be achieved in the project organisations.

3.2 THE RELEVANCE OF BEHAVIOUR FOR PROJECT PERFORMANCE

Why should we study behaviour, or put differently how exactly is behaviour related to project performance? In the section on adversarial relationships above (Chapter 1.1) it was stated that adversarial behaviour (i.e. non-collaborative) has proven to lead to poor project performance (Tang et al., 2006). But does it also hold that collaborative behaviour improves project performance?

Projects are the result of the efforts of people. The human factor is therefore recognised as being an important factor in the realisation of projects. A bad contract with an excellent project team is more likely to result in good project performance than a good contract with a bad project team. In other words, an excellent project team is able to cope with poor starting conditions (Neerlands diep, 2015, p. 6; Suprapto, 2016, pp. viii, 218-220; Van Wassenaer, 2010).

Almost all work accomplished in a project is a result of team endeavour, which indicates the importance of teamwork (Nicholas & Steyn, 2012, p. 528) and thus human interaction and behaviour. Work in construction industry requires pooling together of different specialised parties. These cross-functional teams create interdependence between parties. It is necessary for them to collaborate, to work with other disciplines to accomplish project goals (Anvuur & Kumaraswamy, 2007; Edmondson & Lei, 2014; Nicholas & Steyn, 2012, p. 529). The necessity to collaborate increases with higher degrees of uncertainty and complexity (Anvuur & Kumaraswamy, 2007).

Although its importance is not always recognised, interpersonal behaviour is paramount for project performance (Bresnen & Marshall, 2000; Bygballe et al., 2010). Important processes such as problem resolution, decision-making, risk management, and efficient information circulation, rely on communication and proactive exchange of information.
Tang et al. (2006) for instance state that openness, team building and effective communication facilitate problem solving and timely responsiveness, which in turn improves risk management. Edmondson and Lei (2014) emphasise the importance of psychological safety in organisations. This refers to a culture in which people feel safe to exchange information and knowledge, voice their opinion, propose improvements, and take initiative. This facilitates collaboration, learning in organisations, and increases performance. Edmondson and Lei conclude that a culture of psychological safety is especially important in responding to situations of uncertainty. Hence a number of behavioural aspects play an important role for project performance.

However, as Eisenhardt (1989, p. 61) in a discussion on Agency theory states, "outcomes are only partly a function of behaviors. Government policies, economic climate, competitor actions, technological change, and so on, may cause uncontrollable variations in outcomes". Hence behaviour is not the sole determinant of project performance, but rather a mediator. The conclusion here is that if the team is setup correctly it will be able to deal with any problems and unforeseen circumstances in the best possible way without being interference of interpersonal issues and struggles. Additionally it helps to prevent conflicts. Hence through providing the proper conditions the team is able to handle problems in the best possible way.

3.3 BEST-FOR-PROJECT BEHAVIOUR

The previous section described which factors determine an individual's behaviour, how to influence behaviour in general, and why behaviour is relevant for project performance. Already a number of aspects that are conducive for good project performance were outlined in the text above. This section will further determine what behaviour is beneficial for project performance.
This investigation starts with a discussion of the behaviour of effective teams. The result will then be used to identify the behaviour that is beneficial for construction projects, also referred to before as 'best-for-project behaviour'. A definition for this term will then be provided, followed by a short investigation of how this typical behaviour can be facilitated.

3.3.1 Behaviour of effective teams

The research into effective teams is a valuable reference for identifying behaviour which is conducive for good project performance. Unfortunately most of the research is focused on identifying the factors which enable high team performance and less on what specific behaviour is associated with high team performance. Although these factors are interesting for determining the role of the contract in facilitating behaviour, the focus will first be on identifying which behaviour is performed by effective teams before discussing how this behaviour can be facilitated.

Katzenbach and Smith (2005) mention specific behaviour of effective teams: "listening and responding constructively to views expressed by others, giving others the benefit of the doubt, providing support, and recognizing the interests and achievements of others" (Katzenbach & Smith, 2005, p. 2). The key variable they identify is commitment. Having commitment in the team requires a

common purpose which all team members believe in. Collectively establishing the team's purpose helps build commitment and a feeling of ownership.

Baiden, Price, and Dainty (2006) investigated the extent of team integration within construction projects. They found that a fully integrated team has a common focus and goals, operates seamlessly, aims for a win-win by ensuring that people support each other and achievements are shared, utilises everyone's skills and expertise to improve time and cost estimates, openly shares information between organisational units, has a flexible team composition, is co-located and has an own identity, allows its members to contribute to the project, ensures people are treated equally and with respect, and has a no-blame culture.

Priest, Guthrie, Burke, Bowers, and Salas (2004) define four categories of teamwork behaviour (see Table 4): information exchange, i.e. knowing what information to share and when; communication delivery, how the information is conveyed; supporting behaviour, helping others with their workload when necessary; and initiative/leadership, i.e. guiding the team.

Table 4: A categorisation of teamwork behaviour by Priest et al. (2004, p. 2582)

Information Exchange	Communication Delivery
• Utilizing all available sources of information • Passing information to the right persons without having to be asked • Providing 'big picture' updates	• Proper phraseology • Completeness of standard reports • Brevity/avoiding excess chatter • Clarity/avoiding inaudible communications
Supporting Behavior	**Initiative/Leadership**
• Monitoring & correcting errors • Providing & requesting backup or assistance to balance	• Providing guidance or suggestions • Stating priorities

However, apart from literature on high performance teams there are also other authors that describe specific behaviour in a group setting which is relevant here.

Savelsbergh, Poell, and van der Heijden (2015, p. 408) mention 8 types of behaviour specifically related to learning: "(1) exploring; (2) co-construction of meaning; (3) reflecting on outcomes and (4) processes; (5) communicating; (6) discussing errors and unexpected outcomes of actions; (7) seeking feedback; and (8) experimenting within and as a team".

Edmondson and Lei (2014) investigated the role of psychological safety, a work atmosphere in which people feel safe to exchange information and knowledge, voice their opinion, propose improvements, and take initiative, as an important factor to enable learning in organisation. Behavioural elements related to learning are helping others, voicing one's opinion, speaking up against superiors, knowledge sharing, offering ideas, admitting mistakes, asking help, and providing feedback. This kind of behaviour is essential for solving problems.
Robbins, Judge, Millett, and Boyle (2013, p. 27) describe what they call citizenship behaviour: to "help others on their team, volunteer for extra work, avoid unnecessary conflicts, respect the spirit as well as the letter of rules and regulations, and gracefully tolerate occasional work-related impositions and nuisances".

Conflict can also have a positive effect on team performance, despite its negative connotation. "Disagreements about task content (called task conflicts) stimulate discussion, promote critical assessment of problems and options, and can lead to better team decisions" (Robbins et al., 2013, p. 322). Challenging each other's ideas and assumptions can refine knowledge and ideas. Relationship conflicts which refer to interpersonal tensions and animosity are almost always dysfunctional. Effective teams thus apply task conflict and avoid relationship conflicts. This reflects in the way these teams handle conflicts, i.e. by explicitly discussing the issues (Robbins et al., 2013, p. 322).

3.3.2 Project teams in construction industry

An important difference between the effective teams discussed in literature (part of which is also referred to above) and project teams for large projects is that the latter are larger in size. Literature on effective teams appears to focus on smaller teams which stay together for the duration of the project. Construction project teams are cross-functional teams. These teams are actually composed of several teams, often from various companies. Each team might have different interests and objectives and there are boundaries between them. These boundaries can lead to us versus them attitudes (Nicholas & Steyn, 2012, p. 528) and prohibits forming common goals, common purpose, and confluence.

Anvuur and Kumaraswamy (2007) also discuss this issue. People have a basic tendency to identify themselves with a specific group, called the in-group. The members of the in-group are considered as being more similar, and are evaluated and treated more positively. This leads to us versus them attitudes. In construction industry this situation can for instance be recognised in principal versus contractor situations. When dealing with members of an outgroup there is prejudice and bias.
They refer to the contact hypothesis which identifies a strategy to change the categorisation of in-group and outgroup and thus reduce the distinction between the groups. Four conditions are essential to facilitate more positive intergroup contact "(1) equal group status within the contact situation; (2) common goals; (3) intergroup cooperative interaction; and (4) support of authorities, law, or custom" (Anvuur & Kumaraswamy, 2007, p. 227). This can lead to learning about the outgroup; changing of behaviour towards this group; generating affective ties; and re-evaluation of who belongs to the in-group. Thus effective teams manage to cross the boundaries between subgroups in inter-organisational project teams.

3.3.3 Best-for-project behaviour in contracts

The term best-for-project is often used in literature concerning alliancing. It is used in different combinations, e.g. best-for-project decision making, attitude, behaviour, and motivation. It does not seem to have a definition, and is therefore often put between quotation marks or written in italics ('best-for-project' or *best-for-project*). It is easy to imagine on a conceptual level what it may entail, but far more difficult to come up with a definition. The following paragraphs will focus on the top-level 'best-for-project behaviour' which can be regarded as a subset of all potential behaviour. Interpreted very literally, one can say that it involves behaviour that is beneficial for the project, steering clear of adversarial, 'best-for-self' behaviour, but further elaboration is necessary.

The Australian Practitioner's Guide to Alliance Contracting (Department of Treasury and Finance Victoria, 2010), also uses the term 'best-for-project' and discusses it in relation to best-for-project decision-making in project alliances. Although this statement is made in regard to decision-making, it

gives a good general direction for a definition of best-for-project behaviour.
According to the Department of Treasury and Finance Victoria (2010, pp. 15-16), best-for-project decisions should be in line with the collective vision and objectives of the alliance, rather than the interests of one party; it should adhere to the alliance principles and behavioural commitments which the alliance partners agreed on in the alliance agreement; it should lead to achievement of all project objectives at a fair cost, and should be in line with general standards of conduct and protect the public interest.
The prominent position of acting according to the standards of conduct is interesting. This seems to be in line with the good faith principle in civil law countries such as the Netherlands. In addition, there is an emphasis of acting according to the collective vision that the project participants jointly establish which describes how the project will be conducted, which objectives will be achieved, and how parties will deal with each other.

The Department of Treasury and Finance Victoria (2010, pp. 15-19) also lists other key features of alliancing that relate to behaviour of participants.

- Participants promise not to lay blame and sue each other in case of problems, but to accept joint responsibility and cooperatively seek solutions.
- Participants should act in good faith, and be fair and honest to each other.
- A supporting element is being transparent to the other participants through provision of full access and audit rights.

Another useful description is given by Van Wassenaer & Thomas (Van Wassenaer & Thomas, 2008). These authors compiled a report in which they state what a good construction contract should entail and list a number of general conditions including the principles that should form the basis of a construction project. These principles are (Van Wassenaer & Thomas, 2008, pp. 131-132) (Translated by author):

"Key principle: Collaboration in service of the project.

a) Putting the interest of the project first. This means parties have to collaborate with the other project partners to reach project goals and will do this with respect for each other's interests, and in an atmosphere of mutual confidence and goodwill.
b) Parties will inform each other as soon as possible if they learn of conditions that impede realisation of project goals. Regardless whether these circumstances are under their influence or responsibility. Parties will try to solve problems as a result of these circumstances, if applicable in cooperation with other project partners, as soon and efficiently as possible so the project goals can be reached.
c) Parties will provide each other with all information which is, for the purpose of the project, in their possession and which they need to fulfil their obligations according to the agreement. They will as soon as possible respond to requests of the other party for such information.
d) Parties will provide each other full openness on all areas for which this is necessary to realise the project goals."

3.3.4 A definition of best-for-project behaviour

The results of the discussion above are combined and categorised in Table 5 below. This table forms the basis of a definition of best-for-project behaviour which is defined below.

Table 5: A summary and categorisation of teamwork behaviour

Category	Behaviour
1. Subordinating individual interests	• Subordinating own interests to those of the project (Van Wassenaer & Thomas, 2008, pp. 131-132)
2. Supporting	• Monitoring & correcting errors – Providing constructive feedback (Savelsbergh et al., 2015) (Edmondson & Lei, 2014; Katzenbach & Smith, 2005; Priest et al., 2004) • Providing help & requesting help (Edmondson & Lei, 2014; Katzenbach & Smith, 2005; Priest et al., 2004; Robbins et al., 2013, p. 27) • Do not blame each other in case of problems (Department of Treasury and Finance Victoria, 2010, pp. 15-19) • Co-construction of meaning (value each other's opinion) (Savelsbergh et al., 2015)
3. Pro-actively informing	• Providing necessary information and knowledge (Priest et al., 2004; Van Wassenaer & Thomas, 2008, pp. 131-132) • Quickly respond to requests for information (Van Wassenaer & Thomas, 2008, pp. 131-132) • Admitting & communicating errors (Edmondson & Lei, 2014; Savelsbergh et al., 2015; Van Wassenaer & Thomas, 2008, pp. 131-132) • Informing the other party of any issues that may impede realisation of the project goals (Van Wassenaer & Thomas, 2008, pp. 131-132) • Voicing one's opinion and offering ideas (Edmondson & Lei, 2014; Savelsbergh et al., 2015)
4. Communicating clearly	• Provide 'big picture' updates (Priest et al., 2004) • Provide complete reports (Priest et al., 2004) • Be clear and to the point, avoid excess chatter (Priest et al., 2004) • Listening to each other (Katzenbach & Smith, 2005, p. 2)
5. Providing openness	• Being open about intentions & interests • Providing full openness on areas necessary for realisation of project goals (Van Wassenaer & Thomas, 2008, pp. 131-132)
6. Having a critical attitude	• Reflecting on outcome & processes (Savelsbergh et al., 2015) • Search for and propose improvements / optimisations (exploring& experimenting) (Edmondson & Lei, 2014; Savelsbergh et al., 2015) • Analysing errors (Savelsbergh et al., 2015) • Challenging each other's ideas and assumptions (Robbins et al., 2013, p. 322)
7. Acting in good faith	• Acting in the spirit of agreements (Robbins et al., 2013) • Be fair and honest to each other (Department of Treasury and Finance Victoria, 2010, pp. 15-19)
8. Respect and value each other	• Treating each other with respect (Baiden et al., 2006) • Respect each other's interests (Department of Treasury and Finance Victoria, 2010, p. 17; Van Wassenaer & Thomas, 2008, pp. 131-132) • Treat each other as equals (Baiden et al., 2006; Department of Treasury and Finance Victoria, 2010, pp. 15-19) • Recognising the interests and achievements of others (Katzenbach & Smith, 2005)
9. Quickly resolve problems	▪ Solve problems and conflicts quickly and efficiently (Van Wassenaer & Thomas, 2008, pp. 131-132)

The two formulations in chapter 3.3 above, combined with the categorisation of teamwork behaviour in Table 5, forms the definition of best-for-project behaviour for the purpose of this thesis.

> Best-for-project behaviour is:
>
> Collaboration in service of the project: acting in good faith, with respect for each other, subordinating individual interests to those of the project, supporting and pro-actively informing each other, by communicating clearly, providing openness of information and intentions, being critical towards our work and that of our colleagues, and quickly resolving problems.

3.3.5 Why this behaviour is beneficial for project performance

An important question at this point, is why exactly this behaviour is beneficial for project performance.

Acting in good faith is an overarching norm which implies that people act according to reasonable standards of conduct and take each other's interests into account.
Subordinating own interests ensures the interests of the project are put first. It brings trust and enables supporting behaviour since both parties aim for the same goals.
Supporting and informing each other will result in better and faster processes and responses to problems where necessary, but also increases refinement of solutions and knowledge that is shared.
Providing openness of information and intentions to each other helps to build trust and reduces the need for control. This in turn saves time, effort and money for monitoring. Specific associated behaviour includes responding to requests for information, providing insight into motivations, and allowing access to documentation. Together with an open atmosphere this means problems will be revealed sooner meaning appropriate responses can be implemented faster and will be more accurate.
In the section above on effective teams it was stated that task conflict can be beneficial. Thus challenging each other's assumptions and asking critical questions is positive for the refinement of project work and to look for optimisations. However, this should always be done in a respectful way.
Finally an open atmosphere is necessary for making sure problems are disclosed as early as possible, and knowledge is shared openly.

In general it can be stated that best-for-project behaviour improves the flow of information, the efficiency of (decision making) processes related to problem solving and risk management, and the quality of those decisions, and reduces monitoring costs. It also reduces costs related to conflict resolution and litigation. People can focus on their tasks and issues at hand without being distracted. This increases the efficiency of the construction process, i.e. reduction in time and costs. Thus best-for-project behaviour improves project performance.

3.3.6 Facilitating best-for-project behaviour

Now that a definition of best-for-project behaviour has been found, we can look at how this behaviour can be facilitated. A useful information source is the literature on effective teams which was also referenced earlier in section 3.3.1. An important topic in this is the factors that determine whether teams will be successful and as a consequence what companies can do to establish the

proper conditions which lead to the manifestation of an effective team and to support these teams. Such a team is effective since its members portray the best-for-project behaviour described above. Consequently, through creating the proper conditions for the occurrence of such a team, the desired behaviour can also be achieved.

According to Robbins et al. (2013, pp. 312-322) factors that stimulate the occurrence of effective teams include:

- context factors: adequate resources from organisation (timely information, proper equipment, adequate staffing, encouragement, and administrative assistance), clear leadership and team structure, a climate of trust, performance evaluation and reward system;
- process factors: having a common purpose, specific goals, faith in the team, constructive conflicts, and limitation of shirking;
- and careful selection of the team.

In addition, there are a number of authors which refer to the characteristics of effective teams. These characteristics are also indicators of what can be done to enable such teams. Anvuur and Kumaraswamy (2007, p. 226) in a discussion of partnering and alliancing summarise the characteristics of effective teams as follows: "(1) unitary focus and common goals; (2) interdependence, i.e., mutual respect, equal status, and equal opportunities for participation; (3) mutual accountability, i.e., common fate and a "no blame" culture; (4) confluence, i.e., cohesion, seamless operation". Katzenbach and Smith (2005) identify four characteristics of effective teams: having common commitment and purpose, setting clear performance goals, having complementary skills within the team, and being mutually accountable. Nicholas and Steyn (2012) found similar features of high performance teams. They emphasise (p. 529) "the importance of clear definition of project objectives, clarification of the roles and tasks of team members, strong commitment to achieving objectives, and a "project spirit" that bonds everyone together".

These factors are combined and categorised in Table 6. According to theory, these factors should facilitate effective teams in construction projects and with that ensure establishment of best-for-project behaviour. The contract, procurement process, and other management tools should be employed to that purpose.

The next paragraph will explore which of these aspects the contract is able to influence.

Table 6: Facilitators of high performance teams: The aspects which stimulate the occurrence of high performance teams, i.e. teams which employ the behaviour necessary for good project performance.

Facilitator	Aspects
Common focus & commitment	• Unitary focus & common goals (Katzenbach & Smith, 2005; Nicholas & Steyn, 2012, p. 529; Robbins et al., 2013, pp. 312-322) • Commitment to achieving objectives (Nicholas & Steyn, 2012, p. 529) • Performance evaluation and reward system (Robbins et al., 2013, pp. 312-322)
Interdependence	• Complementary skills (Katzenbach & Smith, 2005) • Equality: equal opportunity for participation (Anvuur & Kumaraswamy, 2007) • Mutual respect (Anvuur & Kumaraswamy, 2007)

Cohesive group	• Joint identity/project spirit (Nicholas & Steyn, 2012, p. 529; Phua, 2004) • Equality of group members (Anvuur & Kumaraswamy, 2007) • Limitation of shirking (Robbins et al., 2013, pp. 312-322) • Seamless operation (Anvuur & Kumaraswamy, 2007)
Clear objectives & roles	• Clear leadership & team structure (Robbins et al., 2013, pp. 312-322) • Clear objectives, knowing what you aim to achieve (Katzenbach & Smith, 2005; Nicholas & Steyn, 2012, p. 529; Robbins et al., 2013, pp. 312-322) • Clear roles & tasks, knowing what you have to do and what others are doing (Nicholas & Steyn, 2012, p. 529)
Mutual accountability	• Climate of trust (Robbins et al., 2013, pp. 312-322) • Faith in the team (Robbins et al., 2013, pp. 312-322) • No-blame culture, people can easily address each other (Anvuur & Kumaraswamy, 2007) • Constructive conflicts (Robbins et al., 2013, pp. 312-322)
Support from organisation	• Timely information • Proper equipment • Adequate staffing • Encouragement • Administrative assistance (Robbins et al., 2013, pp. 312-322)
Team selection	• Careful selection of the team (Robbins et al., 2013, pp. 312-322)

3.4 THE INFLUENCE OF THE CONTRACT ON BEHAVIOUR

It is assumed here that there is a relevant interaction between the contract and resultant behaviour in projects. This assumptions lies at the basis of what various contract forms aim to achieve, which is curbing opportunistic behaviour in transactions (through aligning interests), primarily through application of incentive schemes. However, surprisingly little investigation of this assumption can be found in literature. In the words of Bresnen and Marshall (2000, p. 588) “the relation between incentives, motivation, commitment and trust are not so self-evident and unproblematic as they might at first appear”. They claim that this assumption is overestimated. Correspondingly, Suprapto (2016, pp. ii-iii, 218), in his research on collaborative contracting in projects found that contractual functions are perceived by practitioners as relatively less important and that formal contracts alone are insufficient to establish a collaborative relationship. However, other scholars did indeed find strong support for the role of incentives (Anvuur & Kumaraswamy, 2007).

Of the aspects mentioned in Table 6 above, the contract can contribute in facilitating best-for-project behaviour by setting the context. It defines the goal of the project, construction of a certain object, and establishes the conditions under which parties work together. This concerns the exchange conditions, the quid pro quo, as well as roles and responsibilities. This also means it defines how parties relate to each other, whether they are interdependent and whether they have an equal say in (certain) decisions. Therefore it influences equality of team members. The contract can also define common interests through incentive schemes, establishes the goals of the project, and can establish the leadership structure and decision making rules. Yet these aspects only cover part of the aspects outlined in Table 6. The other factors will therefore have to be addressed in a different way.

Hence the contract is important in establishing the proper context to facilitate best-for-project behaviour. Nevertheless, the contract cannot cover all facilitators and other processes will have to be adopted as well.

3.5 CONCLUSION

This chapter set out to investigate the concept of behaviour. It described how behaviour is established in general, how it can be influenced, which behaviour is desirable in a construction project, and how the contract can potentially facilitate this behaviour.

SQ 1: What is best-for-project behaviour and how does it influence project performance?

3.5.1 Understanding behaviour

How behaviour is determined

Much is still unknown about the determinants of behaviour. However, a number of theories have been developed, of which Ajzen's theory of planned behaviour is one of the key theories. This model states that behaviour is determined by an individual's

- Intention, an individual's motivation to perform certain behaviour
- and perceived behavioural control. The perception of restrictions on their intention to perform certain behaviour.

The intention itself is determined by:

- Perceived behavioural control, whether people think they can fulfil their intention determines how hard they will try.
- Attitude toward the behaviour,
- And subjective norms, an individual's perception of group norms.

Unfortunately, Ajzen's model only predicts about 30% of behavioural variation. Other factors are also of importance. These factors include

- Openness to change: being aware that their behaviour is undesirable, understanding that a change is necessary.
- Having an environment that facilitates specific behaviour: the physical, socio-cultural, economic and political environment. For instance, co-location in the same office (physical), support from colleagues and upper management (socio-cultural), the cost of specific behaviour (economic), and existing rules and regulations (political).
- Habits and automated responses: much of an individual's behaviour is not rational but exists of habits and automated responses. This unconscious 'programmed' behaviour also influences behaviour.

How behaviour can be influenced

Changing an individual's behaviour can be done in a number of ways. The determinants indicated above can all be addressed separately or at the same time to achieve a change in behaviour.
For instance, specific limitations can be implemented to change an individual's perceived behavioural control, e.g. adding control mechanisms in contracts or in practice so people feel restricted in performing certain behaviour. Changing an individual's attitude is much harder, and the same applies to the subjective norms.

Increasing awareness of why certain behaviour is undesirable and promoting positive behaviour can influence an individual's openness to change. For instance, enhancing the awareness of tools and processes to improve cooperation, including the possibilities offered by relationship contracting arrangements. Additionally the environment itself can be changed by removing elements which are likely to foster adversarial behaviour, or arranging the environment (co-location) in such a way that it enables interaction and exchange. Finally, in order to change the automated responses which are part of the adversarial culture in the construction industry will require constant attention.

Relevance of behaviour for project performance

Projects are teamwork and with higher degrees of uncertainty and complexity of projects, the necessity to collaborate also increases. Hence people from different disciplines are involved in projects. These cross-functional teams need to collaborate in order to achieve a successful project. It is necessary for them to communicate, to exchange information about aspects of the project and any problems or risks they may encounter. This interaction is important to be able to achieve project goals.

However, there are still many other factors that can influence project performance (see for instance literature on project complexity, e.g. Baccarini (1996) and Hertogh and Westerveld (2010)). Hence behaviour is not the sole determinant of project performance, but rather a mediator. Through providing the proper conditions the team is able to handle any situation or problems in the best possible way with the least possible interference of interpersonal issues, or miscommunication.

3.5.2 Best-for-project behaviour

The definition of best-for-project behaviour

Through analysis of literature on a number of topics related to team behaviour – behaviour of effective teams, team learning behaviour, as well as references to behaviour in literature on contracting – a number of behavioural aspects were identified. These were then aggregated into several categories of behaviour which led to the following definition of best-for-project behaviour:

> Collaboration in service of the project: acting in good faith, with respect for each other, subordinating individual interests to those of the project, supporting and pro-actively informing each other, by communicating clearly, providing openness of information and intentions, being critical towards our work and that of our colleagues, and quickly resolving problems.

Relation to project performance

This behaviour was found to be beneficial for project performance since it improves the flow of information, the efficiency of (decision making) processes related to problem solving and risk management, and the quality of those decisions, and reduces monitoring costs. It also reduces costs related to conflict resolution and litigation. People can focus on their tasks and issues at hand without being distracted. This increases the efficiency of the construction process, i.e. reduction in time and costs.

Facilitating best-for-project behaviour

With a definition of best-for-project behaviour in place, it was investigated what steps can be taken in order to achieve this behaviour. Literature showed a number of aspects which are important to

facilitate effective teams, i.e. the teams showing best-for-project behaviour. Creating the proper conditions for these teams will therefore result in teams showing best-for-project behaviour. The facilitators that were identified include: having common focus and commitment, interdependence, a cohesive group, clear objectives and roles, mutual accountability, support from organisation, and team selection.

3.5.3 The role of the contract in facilitating best-for-project behaviour

This thesis is about comparing and categorising different types of relationship contracting arrangements aimed at achieving better relations between client and contractor in construction projects. Therefore the potential relation between the contract and achieving best-for-project behaviour was also investigated.

A contract can influence a number of the determinants of behaviour that were found in Chapter 3.1.3. It can impose limitations on an individual's perceived freedom to perform a specific action, for instance through a monitoring or reporting system, or through a penalty system. The opposite is also possible. Through rewarding certain behaviour it becomes a more attractive choice for an individual to adopt. This is related to the economic environment: the cost or benefit of behaviour.
When looking at the group level it was found that contracts can influence part of the aspects which were identified as facilitators of effective teams (Chapter 3.3.6). These are: defining clear project goals, aligning interests, performance evaluation and reward systems, establishing an organisation with equal involvement, and establishing clear roles and responsibilities. This leads to common interests, equality through involvement in decision making and a leadership structure focused on involving all parties, and interdependence between parties.

These facilitators will be used in the determination of relevant parameters in Chapter 5.

4. THEORIES ON CONTRACTING

This chapter will discuss four theories on contracting in order to identify a number of elements and governing mechanisms which, according to the theories, should be present in a contract.

This chapter will provide an answer to sub question 2: Which typical elements and governing mechanisms in the contract are important in fostering best-for-project behaviour, according to theories on contracting (TCE, Principal-Agent theory, Stewardship theory, Relational Contract Theory)?

Chapter 4.1 will discuss Principal-Agent Theory, followed by Stewardship Theory (4.2), Relational Contract Theory (4.3) and Transaction Cost Economics (4.4). This chapter will conclude with a summary of the different perspectives provided by the theories and an overview of the elements and governing mechanisms identified in the four subchapters.

4.1 PRINCIPAL-AGENT THEORY

The basic notion of Principal-Agent Theory is that a client (principal) hires another party (agent) to perform a certain task (Müller & Turner, 2005). This means that the agent will also take decisions on behalf of the principal, decisions which may impact the principal himself. If the self-interests of the agent differ from those of the principal and the principle is unable to observe the actions of the agent, a problem may occur for the latter. The principal cannot be certain the agent will act in the principal's interests.

Principal-agent theory is based on two crucial assumptions: hyperrationality of man, meaning a person is "able to make very difficult deliberations and computations very quickly" (Petersen, 1993, p. 279), and secondly that actors will pursue their (economic) self-interests and will thus behave opportunistically. When a principal hires an agent to do specific work, he becomes dependent on the agent. But since both parties aim to maximise their own interests they are likely to have differing interests concerning the work to be performed. This is where friction in the principal-agent relation occurs. Hyperrationality means that a person can always take a decision that is optimal for his self-interest.

An important characteristic of the principal-agent relation is *information asymmetry*, meaning both parties do not have access to the same amount of information. Therefore the principal cannot fully understand why the agent takes certain decisions or performs certain actions and whether this is actually in the best interest of the principal. Two situations can be discerned here. The first situation is *hidden action* in which the principal does not observe the action of the agent but only the outcome. Based on the output alone, a principal cannot judge whether the agent put in sufficient effort. The second situation concerns *hidden information*. In this situation the principal is able to observe the actions of the agent, but not the environmental factors. Without knowledge of the context, the principal cannot fully understand the decisions taken by the agent (Petersen, 1993).

This leads to two issues for the principle called *moral hazard,* the risk of a lack of effort on the part of the agent, and *adverse selection*, upon selection of an agent, the principal does not know whether a potential agent actually possesses the abilities he claims to have (Petersen, 1993). Moral hazard and adverse selection pose problems to the principal. This has to do with observability: can the principal fully trust the agent, or can he in some way increase his knowledge of what is happening?

4.1.1 Governing mechanisms

An obvious solution to information asymmetry is for the principal implement information systems such as budgeting or reporting procedures (Eisenhardt, 1989). Monitoring also has associated costs and it may not economically be possible or desirable to gain complete insight in the actions of the agent. Furthermore, it can also be explained as a sign of distrust and adversely affect the relations. The remuneration scheme can also be used to align the interests of principle and agent. Actions in the interest of the principle can thus also be aligned with the interest of the agent (Müller & Turner, 2005). This reduces or even removes the need for monitoring. The principal can choose to reward output, behaviour, or a combination of both. This choice is related to the observability of the outcome or actions. If the client cannot (economically) verify the actions of the agent due to hidden action or cannot estimate the influence of environmental factors due to hidden information, he can decide to choose to reward the outcome. If the principle can easily measure and observe the output, outcome-based rewards are a good option. If actions are easy to observe and they can be discerned from the environmental factors, action-based rewards are possible (Petersen, 1993). The choice for outcome-based contracting also means transferring risk to the agent. The agent becomes fully responsible and thus it will be in his interest to fully commit. However, assuming an agent is risk averse this will involve additional costs.
Adverse selection can be addressed through the procurement process (not discussed in this thesis).

Table 7 gives an overview of the issues and presented solutions.

Table 7: Overview of issues and solutions. More factors are of influence in practice.

Issue	Description	Solution
Information asymmetry	Principal has less information than agent	Monitoring
Hidden action	Unclear what agent is doing	Outcome-based contracting
Hidden information	Influence of environmental factors unclear	Outcome-based contracting
Moral Hazard	Shirking by the agent	Increase monitoring,
Adverse selection	Unclear whether agent possesses the expertise he claims to have	Procurement process

4.1.2 Conclusion for Principal-Agent Theory

Principal-agent theory is concerned with efficiency of contracting for services (in the broadest sense). It provides an analytical tool to break down complicated transactions into simple isolated exchange situations in order to analyse and predict behaviour of humans.

The issues of information asymmetry and related moral hazard and adverse selection describe real-world problems a principle in construction industry has to deal with. The adverse relations in construction industry are a perfect example of opportunistic behaviour in practice. This highlights the relevance of principal-agent theory.

Principal-Agent theory simplifies real-world situations to that of a single principal and single agent isolated from their context which does not reflect reality (Eisenhardt, 1989; Sappington, 1991). In addition, the image of the hyperrational, opportunistic and self-interested homo economicus misrepresents reality. The theory focuses mostly on monetary rewards while in reality there are also other more intangible factors which motivate people, such as worker loyalty and pride in the work someone performs (Sappington, 1991), or which motivate companies, such as knowledge development or reputation development.

4.2 STEWARDSHIP THEORY

This brings us to the second theory which is based on a more humanistic model of man. Stewardship theory is often presented as a counterweight to agency theory (Pastoriza & Ariño, 2008). It is based on the same situation, one party contracting with another and the relationship being studied is that of principal and manager. However stewardship theory is derived from organisational behaviour, sociology, and psychology, while agency theory starts from an economic perspective (Davis, Schoorman, & Donaldson, 1997; Van Slyke, 2007).

Stewardship theory still assumes man to be rational, but now man believes that more can be gained by collaborative behaviour than through self-interested behaviour. Moving beyond purely extrinsic (i.e. financial) rewards, the main motivators for stewards are intrinsic rewards such as growth, achievement and duty (Davis et al., 1997; Pastoriza & Ariño, 2008; Van Slyke, 2007).

Caers et al. (2006) discern two approaches within stewardship theory. The first assumes the interests of principal and steward are the same, the second that there are differences between their interests but that the steward will still act within the interests of the principal and not pursue his own. This means that the steward can be trusted and thus should be given sufficient leeway to take any necessary actions to maximise the outcome. In addition this means control mechanisms can or even should be reduced since they can work counterproductive by lowering the steward's motivation or by having to spend effort on meeting monitoring demands (Davis et al., 1997).

4.2.1 Determining the type of relation

An individual will have a predisposition towards a stewardship or agency position. This predisposition is an indication of the attitude someone has when entering a relationship. Davis et al. (1997) developed the Principal-Manager Choice Model to determine whether a stewardship relation will occur depending on the positions the principal and manager adopt. If both parties adopt an agent position a mutual agency relationship occurs. The principal expects opportunistic behaviour and implements control mechanisms, and the agent will act opportunistically. If one of the parties adopts a steward position and the other an agent position, the party adopting a steward position will feel angry and betrayed when the other party acts opportunistically. As a consequence the party that feels betrayed will also adopt an agent position. A third situation occurs when both parties adopt a stewardship position, resulting in a mutual stewardship position with low control by the principal. Both parties can achieve maximum utility in this situation (Davis et al., 1997).

This relation is dynamic. From interaction parties will learn about the motivations of one another. Even if there is an initial mismatch between parties, they can still work to develop a stewardship relation. Reciprocity is an important aspect of the relation between parties in that respect. Paying attention to the effects of your actions on the other party can teach the other to behave in a similar fashion (Pastoriza & Ariño, 2008).

4.2.2 Governing mechanisms

An important question that is not answered in literature is how to get to a mutual stewardship position. There are only some unclear references to investing in mechanisms to get to know the other party. Another possibility is to adopt selection processes to get to know a party's motivation. Knowing a person's motivation enables the principal to more accurately make an assessment of the behaviour to be expected and adapt his initial position (agency or steward) to this expectation.

Furthermore, since the steward is already assumed to be acting in the interest of the principal there is no need to adjust the steward's behaviour. The key question according to stewardship theory is how best to facilitate the steward so he can be most efficient, for instance by giving sufficient freedom to decide and sufficient authority to act (Davis et al., 1997).

4.2.3 Conclusion for Stewardship Theory

Stewardship theory can be regarded as being too idealistic (Davis et al., 1997; Pastoriza & Ariño, 2008) and not being representative of reality. But the latter was also said about principal-agent theory. They can also be seen as being complementary (Pastoriza & Ariño, 2008), with the position of stewardship representing one side of the continuum and agency representing the other. In reality a person will be somewhere in-between.

Unfortunately, the direct applicability of stewardship is limited. It offers an interesting counterweight to agency theory and represents a more positive approach towards the interaction between parties. But no clear methods are described how to obtain a stewardship relation. In addition, since no divergence of interests is assumed, no governing mechanisms or tools to maintain the relation are described. What stewardship does show is that the need to align the interests through financial incentives, curb the agent and institute control that is expressed by agency theory should at least be nuanced. This is in line with observations made by e.g. Bresnen and Marshall (2000) and Anvuur and Kumaraswamy (2007) who concluded that there are limitations to economic motivations and related incentives in contracts to steer behaviour. Thus stewardship theory can be beneficial in providing a balanced view on the usefulness of incentives and related behaviour in a contract.

4.3 Relational Contract Theory

Relational contract theory is based on an empirical investigation by Macneil how contractual parties in complex long-term relations behave in practice. It turned out they adhere less importance to the juridical aspects of their relation than was commonly assumed. When conflicts arise they try to find a solution without immediately referring to the contract. The reason for this discrepancy is that the parties believe more value can be achieved by continuation of their relation. Macneil therefore concluded that the existing rules of contract law were unsuitable for the reality of complex contractual collaborations, since they were based on discrete transactions: simple contracts with a short duration, limited need of interaction and cooperation, in which risks can be easily assessed, without shared profits or losses, and where it is possible to accurately define rights and obligations at the start (De Hoon, 2005, pp. 98-100).

Macneil thus has a different perspective on the role of contracts in contractual relations. He states that all contracts are embedded in relations, even the most formal contract (Poppo & Zenger, 2002; Van der Veen & Korthals Altes, 2011). This means the context will always play some role, although the extent to which it is of importance can differ for each case. The contract is one part of the relation between client and contractor. The content of the contract does not necessarily reflect the actual relations between parties. The parties may diverge from the stipulations of the contract and adopt a different working relation from what was initially established. They can choose to ignore the stipulations of the contract to maintain a relation. Furthermore, the relation between the parties is

not fully established in the contract but can extend (far) beyond this single document. To fully comprehend the relation between the parties studying the contract alone will not suffice (De Hoon, 2005, pp. 99-100; Van der Veen, 2009, pp. 44-46).

For this thesis it is thus important to not only investigate the different contract types, i.e. what the contracts say, but also what it means in practice. Do the practitioners see value in the way the contract is defined? Do they use the contract? Does it (still) reflect daily practice?

4.3.1 The 10 common contract norms

The studying of transaction and relations forms the main body of relational contract theory. The theory offers a means for analysing contracts from the perspective of relations (Van der Veen & Korthals Altes, 2011). Macneil proposed 10 common contract norms which together form a framework to study the interaction between parties. These 10 norms are abstract and difficult to comprehend, with scholars also having different opinions concerning their content. As their primary purpose is the analysis of relations, elaborating the precise meaning of these norms goes too far.

The 10 norms cover a number of aspects relevant for the study of relations: (1) the roles of parties, whether they adhere to their roles; (2) the expectations concerning extrinsic and intrinsic rewards and costs, but also concerning behaviour; (3) planning on how goals will be achieved; (4) commitment to the exchange; (5) flexibility through the contract or by choosing to ignore a part of the contract; (6) contractual solidarity and cooperation of the parties over time to make the exchange work; (7) the right of compensation in case expectations are not met, a party is treated unfairly, or for non-explicit promises; (8) creation and restraint of the powers of the contracting parties; (9) having sufficient means and sufficient freedom to use them in order to perform the actions required by a contract; and (10) comply with the general social norms of society and or a specific branch (De Hoon, 2005, pp. 101-104; Diathesopoulos, 2010, pp. 20-27; Van der Veen, 2009, pp. 53-61).

4.3.2 Discrete and relational contracts

As the name implies, the common contract norms are the norms present in all contracts, albeit their respective importance varies per case (De Hoon, 2005, pp. 100-101; Van der Veen, 2009, pp. 52-53). Macneil uses his 10 norms to make a distinction between discrete and relational contracts. Discrete contracts are focused on the exchange itself, presume that the future can be fully planned, that this planning should be followed regardless the consequences for the parties, and enforce unequal bargaining positions without offering a method to correct them (Van der Veen, 2009, pp. 65-67).

Relational contracts on the other hand put the relation up front and emphasise role integrity, preservation of the relation, harmonisation of relational conflict, having adequate means, and incorporation of general social norms. Preservation of the relation implies that parties will value the continuation of the relation above any short-term gains that may harm the relation. Harmonisation of relational conflict means that parties will try to resolve any conflicts that may occur without resorting to remedies (e.g. sanctions, dissolution) (Van der Veen, 2009, pp. 67-68, 85-86).

The distinction between discrete and relational can be used to characterise whether the content of contracts, using the 10 norms as a guideline of the elements to assess, is aimed towards discrete, relational, or somewhere in-between (Van der Veen, 2009, pp. 62-68).

4.3.3 Governing mechanisms

When it comes to specific contract clauses relational contract theory is not very clear. However, Van der Veen and Korthals Altes (2011) in their study of urban development agreements developed a useful translation of Macneil's norms by establishing five guidelines. These guidelines, see Table 8, are an indication of what elements an urban development agreement should contain in order to provide the right conditions for a successful urban development project.

Table 8: An overview of the guiding principles of Van der Veen & Korthals Altes. Source: Van der Veen and Korthals Altes (2011, p. 315).

Guiding principles	Short description
1. Focus on relations	- Acknowledge that contracts are embedded in relations. - Introduce relational norms to accommodate them.
2. Focus on the interest of the project	- The focus of the agreement must not be on the interests of parties involved. Goals of the parties should be weighed against this rule.
3. Specify functions of the agreement	- Exchange function; the quid pro quo - Planning function; the planning of the project - Statutory function; the rules that parties must comply with - Instrumental function; the public goals that are pursued by the planning authorities
4. Specify goals of the agreement	- What is the aim of the contracting parties? - What is the aim of the project? - What is the aim of this specific agreement?
5. Plan for flexibility	- Make sure that the contract can accommodate changing circumstances

1. Focus on relations

Due to the long duration and extensive cooperation between client and contractor(s), parties should acknowledge the importance of relations and plan for the development of their relation. They should discuss mutual expectations, promote the development of trust, and address the relational norms 'preservation of the relation', and 'harmonisation of relational conflict'. In the Netherlands, the principle of good faith works as a comprehensive, supra-contractual norm (Van der Veen & Korthals Altes, 2011).

2. Focus on the interests of the project

Certain provisions can be made that are useful for the relation, but which may hinder the development of the project. For instance in case parties make an agreement to postpone a decision that parties cannot agree on. This is not in favour of the project (Van der Veen & Korthals Altes, 2011).

3. Specify functions of the agreement and separate them

A development agreement can have four functions: a statutory, planning, exchange, and tool function. The *statutory function* concerns the duties, obligations and procedures that parties must comply with. The *planning function* refers to planning the actions necessary for realisation of the project. The *exchange function* is about the exchange of money and goods, or the quid pro quo. Lastly the *instrumental function* refers to the project as a tool for the government with which it can pursue public goals. Although these functions are often to some extent all addressed in a development agreement they are not always clearly distinguished from each other. This can result in overlap and confusion regarding the goals of certain elements (Van der Veen & Korthals Altes, 2011).

4. Specify goals of the agreement

A distinction can be made between goals of the agreement, goals of the parties, and goals of the project. These do not necessarily coincide. By specifying the three types of goals any conflicting goals can become apparent (Van der Veen & Korthals Altes, 2011).

5. Plan for flexibility

Due to many uncertainties the project parties should plan for unforeseen events. This can be done by leaving room for change, include methods to change the agreement, and offer periods to reflect on the cooperation (Van der Veen & Korthals Altes, 2011).

4.3.4 Conclusions for Relational Contract Theory

Relational contract theory lies at the basis of relationship contracting arrangements. Project alliances, integrated project delivery, project partnering, and similar arrangements (see Chapter 6) are all based on this theory (De Hoon, 2005, p. 105; Kamminga, 2009). This makes it a relevant theory to study. However, relational contract theory is also a difficult theory to comprehend. It is abstract, conceptual, and its main purpose is to provide a tool to study transactions and relations between parties (Van der Veen & Korthals Altes, 2011).

However, based on the 5 guiding principles and thus indirectly relational contract theory, what we would expect to find in a contract is (Van der Veen & Korthals Altes, 2011):

- Description of the parties involved, their expectations, and interests.
- Description of relational norms and rules of conduct.
- Conflict resolution methods.
- Contract written on the basis of the interests of the project.
- Clear description of what is exchanged, the quid pro quo.
- Clear project planning.
- Duties and obligations of the parties; procedures, and rules of conduct.
- Elaboration of the goals of the agreement, of the project, and of the parties involved.
- Room for change, methods to adapt the contract, periods to reflect.

4.4 TRANSACTION COST ECONOMICS

Transaction-Cost Economics (TCE) is a theory that explains why companies exist and explores the boundaries of companies within markets. It is concerned with the question how parties should be related to each other, and whether activities should be done by a firm itself or outsourced (make or buy decision). There are costs involved in making transactions with another party. If a transaction is recurring, it might be more economic to internalise the transaction, i.e. take over a company that has a specific expertise that a company frequently uses (Williamson, 1981). As Shelanski and Klein (1995, p. 337) state: *"Simply put, TCE tries to explain how trading partners choose, from the set of feasible institutional alternatives, the arrangement that offers protection for their relationship-specific investments at the lowest total cost".* TCE is thus concerned with choosing the right type of contract (Müller & Turner, 2005).

Transaction costs represent friction in transactions, for instance misunderstandings and conflicts, which lead to delays, breakdowns of service, and other malfunctions (Williamson, 1981). The theory is widely used in many fields of study, including for the overall structure of the firm, whether

activities should be performed within the firm or acquired, and how human assets should be organised.

4.4.1 Opportunism in transactions

Transaction cost economics assumes man to be boundedly rational. This means that he will in general act rationally but there are limits to his problem-solving capacity and information processing capacity. Furthermore, at least some people are assumed to be opportunistic, or in other words not fully trustworthy. The consequence of these assumptions is that it complicates contracting. Comprehensive contracting is not possible if people are boundedly rational, since they cannot consider or process all eventualities. Thus incomplete contracting is the best that can be achieved. However, incomplete contracting becomes problematic if at least some principles or agents are opportunistic. A promise by either principal or agent to act in good faith in case of unanticipated events is not reliable. Thus the contract should deal with these circumstances (Williamson, 1981).

4.4.2 Asset specificity, frequency of exchange, and uncertainty

There are three important concepts within transaction cost economics that are determinants for the most efficient form of organisation. *Frequency of exchange* determines whether a transaction is occasional or recurring. If a transaction occurs only occasionally, an agent is less concerned for his reputation when he acts opportunistically. A recurring transaction on the other hand will have an incentive to invest in relations (Voordijk, de Haan, & Joosten, 2000).

Asset specificity refers to specific investments, both tangible and intangible, which are made in the context of a transaction (Shelanski & Klein, 1995). If the assets have limited or no value outside the transaction, the parties will have a high interest to complete the transaction. A situation of high asset specificity can result in mutual dependency. The principal cannot easily turn to another party and the contractor cannot terminate the contract without losing his investments (Williamson, 1981).

Uncertainty can be related to the natural environment e.g. geological or weather; to the organisation e.g. tensions in temporary project coalitions. *Contracting uncertainty* refers to uncertainty in cost estimation, and *performance ambiguity* refers to uncertainty in metering problems concerning the performance of an agent (Voordijk et al., 2000). Increasing levels of uncertainty requires adaptability.

4.4.3 Governing mechanisms

The potential for opportunism in the transaction is a result of the different combinations of asset specificity, frequency of exchange and uncertainty. This potential can be mitigated by selecting the appropriate governance form or contract. The governance mechanism to curb opportunism is thus the selection of the governance structures. This choice has consequences for the relations between parties but transaction cost economics does not give indications of specific governing mechanisms to be adopted in a contract to manage these consequences.

4.4.4 Conclusions for Relational Contract Theory

Transaction cost economics offers a method of analysing and explaining organisational structure, i.e. the choice of hierarchy, market, hybrid structure for the firm. Transaction costs are a consequence of friction. The amount of transaction costs determines which organisational structure is most economical. The degree of asset specificity, uncertainty, and frequency of exchange determines the governance structure which is most efficient. For the construction industry and in particular the large

complex projects under investigation here, this characterisation is high asset specificity, high uncertainty, and low frequency of exchange[3]. Williamson (1979) suggests the neoclassical contracts, with arbitration systems to resolve disputes, are most applicable. However, with increasing levels of uncertainty, adaptability of the contract becomes a prime concern hence moving into the realm of the relational contracts.

The make or buy decision can be applied to decide on the involvement of the client organisation in a project. Whether or not client involvement is desirable depends on the characteristics of the project and the policy of the organisation. High involvement means the principle will 'produce' more by itself, therefore transaction costs will be low (less work is outsourced). Low involvement means more work is outsourced and thus transaction costs will be higher.

Overall, the applicability for this thesis is limited. The focus of transaction cost economics is how to structure the firm in general, and to decide between own production or outsourcing concerning the acquisition of specific products or services. These decisions are taken at a different moment in the life of a construction project, and do not concern the specific organisation of the contract to be used in a project. Neither does it refer to behaviour of parties apart from identifying the potential for opportunism.

4.5 CONCLUSIONS FROM THEORIES ON CONTRACTING

This section will summarise the overall findings from the literature on contracting theories. The goal of this chapter was to gain insight in different perspectives on contracts and the role of contracts between parties, and to identify elements and governing mechanisms that should be adopted in a contract. Thereby answering the second sub question:
Which typical elements and governing mechanisms in the contract are important in fostering best-for-project behaviour, according to theories on contracting (Principal-Agent theory, Stewardship theory, Relational Contract Theory, Transaction Cost Economics)?

The conclusions that can be drawn are twofold. First the conclusions concerning the different perspectives on contracting will be described, followed by those regarding the specific elements and governing mechanisms that should be adopted in a contract, according to theory.

4.5.1 General conclusions from the theories

Overall, the four theories are quite divergent. They each have their own focus and balance each other out. Every theory has its own assumptions and reasons for advocating a specific clause or governing mechanism. See Table 9 for a general overview. However, this also means that no clear-cut conclusions can be drawn. The four perspectives do offer a complete overview of contracting and also indicate the shortcomings of the models.

[3] In the construction industry a contract is usually only for a single, one-off project, so the contractor will often only meet this client once. So he will not have to worry about his reputation (Voordijk et al., 2000). For large public clients the frequency of exchange is often high. But since it is very difficult to exclude parties beforehand reputation is less of an issue. In addition, the project team will vary from one project to the next. Therefore frequency of exchange is still said to be low.

Table 9: Comparison of the main elements of the theories

	Principal-Agent Theory	Stewardship Theory	Relational Contract Theory	Transaction Cost Economics
Background	Economy	Sociology, psychology	Contract law, sociology	Economy
Prime focus	Contract	Relation between principal and manager	Contract as part of a relation	Transaction
Assumptions	▪ Hyperrational ▪ Opportunistic ▪ Self-interested	Altruistic		▪ Boundedly rational ▪ Opportunistic
Prime tenets	Diverging interests	Interests are aligned or agent's interests subordinated	Contracts embedded in relations	Transaction costs determine whether market/hierarchy/ hybrid is most efficient
Governing mechanisms	▪ Information systems: performance measurement. ▪ Alignment of interests through remuneration	Not necessary	Shared norms and informal mechanisms	None indicated
Motivation	Financial (extrinsic) rewards	Intrinsic rewards	Maintaining the relation	Extrinsic rewards
Monitoring	Extensive	Not necessary	N/A	N/A
Trust/Control	Control	Trust	N/A	Control

Principal-agent theory describes the problems the construction industry is being faced with. Information asymmetry, hidden action, hidden information, moral hazard, and adverse selection are very recognisable issues. The possibility of opportunistic behaviour is also a real-world problem. Consequently, in order to deal with these issues, there has been a tendency to strive for alignment of interests and implement monitoring and information systems.

Stewardship theory on the other hand opposes the agency view of self-interested, hyperrational, and opportunistic man and instead assumes the perspective of an altruistic individual. This individual will value the interests of the principal over his own. Therefore he will always act in the best interest of the principal and no alignment of interests through incentives, or monitoring will be necessary.

From the agency versus stewardship discussion in chapters 4.1 and 4.2 it was concluded that individuals are located on an agency-stewardship continuum (Figure 4). Pure agency on the left of this continuum assumes opportunistic agents which require alignment of goals through incentives and monitoring systems to check their work. On the other side are the stewards who are self-motivated to perform the work of the principal and do not require any governing mechanisms. Since individuals are located somewhere in-between, there will be at least some degree of opportunism. Too much focus on the agency perspective will mean too much control and distrust. Furthermore, the relation between the parties is dynamic: it is possible to change an agency attitude into steward by giving the right example.

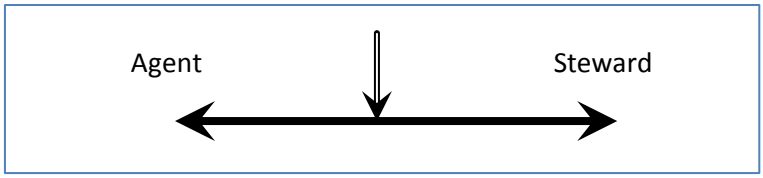


Figure 4: an individual in the agency-stewardship continuum.

With his relational contract theory Macneil stated that contracts are used somewhat different from what is normally thought. In reality contracts are not always strictly followed and they do not necessarily reflect the reality of working methods and obligations that were adopted by the parties.

The contract is just one part of a more extensive relational context. The contract is therefore no longer seen as an independent and static item. This way it better meets the reality of large, complex projects. Relational contract theory advocates an increased attention for developing and maintaining the relation between parties.
Relational contract theory forms the basis for relationship contracting arrangements: contracts aimed at preserving the relation between contracting parties and dealing with adversities and change. Macneil's complex and abstract theory was translated in a more practical set of guiding principles by Van der Veen and Korthals Altes (2011).

Lastly, transaction cost economics is a theory that focuses on analysing and explaining the choice of organisational structure: hierarchy, market, and hybrid. The involvement of the principal is a key aspect in the choice for one type of contract or another. However, this choice is not relevant for the *content* of a contract form.

4.5.2 Elements and governing mechanisms

The diversity of the theories makes it difficult to draw clear conclusions concerning elements and governing mechanics to be adopted in a contract.

Based on the theories, two approaches can be taken: control-oriented or trust-oriented. Finding the proper balance is a key challenge. Each case requires a different balance between trust and control. Too much focus on control leads to a loss of flexibility and creativity, and increases governing costs. Too much focus on trust can lead to a loss of focus, lower efficiency, free-riding, and opportunism (De Man, 2013, pp. 9-13).

Opportunism was identified as an issue that is to be expected. Therefore governing mechanisms to cope with opportunism will be necessary. Overall, a distinction can be made between formal and informal governing mechanisms (De Man, 2013, pp. 28,39; Laan et al., 2011), also referred to as formal contracts and relational governance (Poppo & Zenger, 2002). The formal mechanisms are addressed in the contract or in official rules. Relational contract theory indicated the need to ensure relations and their development are specifically addressed. This is done via relational mechanisms which can be formal, contractual obligations to establish norms and values or define common goals, or non-formal, using collaborative practices to e.g. increase understanding of each other's motivations.

How do the formal and relational mechanisms relate to each other? There is a discussion between scholars whether these mechanisms are substitutes or complementary to one another. Poppo and

Zenger (2002) claim they are complementary, but Dekker (2004) claims this complementarity only holds up to a certain threshold. The formal elements form a basis, but too much focus on formal elements (control) will be interpreted as a sign of distrust.

Formal governing mechanisms

Formal governing mechanisms consist of formal rules, procedures, and policies aimed at enforcing control. "Formal control contributes to limiting the opportunities and incentives to deviate" (Laan et al., 2011, p. 663). These formal governing mechanisms encompass the financial model, i.e. the remuneration scheme, incentive structure, and risk and reward sharing. Specific planning indicates the actions which are expected of a contractor and monitoring can be used to establish whether a party deviates from what was agreed upon in the contract, thus bridging information asymmetry. Procedures for changing or terminating the agreement are also included in these formal mechanisms (De Man, 2013, p. 28). Table 10 presents an overview of the governing mechanisms found in the theories on contracting and the formal governing mechanisms which are deduced from them.

Table 10: Deducing formal governing mechanisms from theory.

Theory	Governing mechanism according to theory	Formal governing mechanisms
P-A RCT	➢ Remuneration method to align interests ➢ Clear description of what is exchanged, the quid pro quo (Van der Veen & Korthals Altes, 2011).	**Remuneration scheme**
		Incentive structure: bonuses & sanctions
		Risk and reward sharing
RCT	➢ Clear project planning (Van der Veen & Korthals Altes, 2011).	**Planning:** planning, risk management, evaluation moments
P-A	➢ Information systems: performance measurement (passive), obligation to disclose information (active)	**Monitoring:** performance measurement reporting, audits
		Transparency: open-book
		Mutual early warning
RCT	➢ Duties and obligations of the parties; procedures, and rules of conduct (Van der Veen & Korthals Altes, 2011).	**Duties and obligations**
RCT	➢ Room for change, methods to adapt the contract, periods to reflect on the method of cooperation (Van der Veen & Korthals Altes, 2011).	**Change procedures**
		Exit agreement: conditions and mechanisms for dissolution
RCT	➢ Conflict resolution methods (Van der Veen & Korthals Altes, 2011).	**Conflict resolution methods**

Relational governing mechanisms

Due to uncertainty inherent in a project and the relationships between parties – it is not possible to fully predict how a party will behave – not all aspects can be captured in a formal contract. Thus, formal control on adhering to what is stated in the contract is unlikely to be fully effective (Laan et al., 2011). It is also the question whether it is desirable. If anything, relational contracting theory described the need to move beyond formal control. Furthermore, control adopted by the client to counteract opportunistic behaviour can actually incite this behaviour as contractors do not feel treated as equals (Laan et al., 2011).

The relational mechanisms are related to relational contracting theory, focusing more on the inclusion of norms and values in the form of codes of conduct in order to ensure continuance of the

relation and completion of the project. The contract should also be written on the basis of the goals of the project, not any individual goals of the parties, thereby putting the goals of the project first.

Stewardship theory described situation of having a client acting as a steward and a contractor acting as an agent. Initially trust may not yet be present but when parties prove to commit to their word the amount of trust builds over time. Consequently it can reduce the need for control (De Man, 2013, pp. 43-45). In terms of stewardship theory: initially parties may act more from an agency position, but when trust develops the parties move towards a stewardship position and the degree of control can be diminished.

Additionally, the development of personal relationships and team building is beneficial for establishing and maintaining the relationship. This can be done in the form of co-location, team-building activities, and personnel exchanges. Development of personal relations increases understanding of each other and improves communication, makes tensions easier to resolve, and puts less pressure on the escalation system (De Man, 2013, pp. 39-43). Monitoring can also be done in an informal way through showing a personal interest and staying informed on project progress instead of only measuring parameters from a distance (Laan et al., 2011).

Table 11 presents an overview of the governing mechanisms found in the theories on contracting and the relational governing mechanisms which are deduced from them. Not all of these governing mechanisms can be addressed through the contract. Those mechanisms marked by an asterisk (*) will have to be addressed differently.

Table 11: Deducing relational governing mechanisms from theory. Items marked by an asterisk (*) cannot be addressed through the contract.

Theory	Governing mechanism according to theory	Relational governing mechanisms
RCT	➢ Description of the parties involved, their expectations, and interests (Van der Veen & Korthals Altes, 2011)	**Description of the parties involved, their expectations, and interests**
RCT	➢ Elaboration of the goals of the agreement, of the project, and of the parties involved (Van der Veen & Korthals Altes, 2011)	**Description of goals of project, agreement, parties**
RCT	➢ Description of relational norms and rules of conduct. (Van der Veen & Korthals Altes, 2011)	**Inclusion of norms and values**: statement of desired behaviour
RCT	➢ Contract written on the basis of the interests of the project (Van der Veen & Korthals Altes, 2011)	**Putting goals of the project first**
St. Sh	➢ Using reciprocity of behaviour: adjusting behaviour of agent by showing the desired behaviour as principle. Therefore using increasing trust to reduce the degree of control, i.e. when agent moves towards a stewardship position, reduce the degree of control	**Using increasing trust to reduce the degree of control*** (De Man, 2013, pp. 43-45)
		Informal monitoring through personal relations* (Laan et al., 2011).
		Personal relationships and team building* (De Man, 2013, pp. 39-43) e.g.: ▪ Co-location ▪ Team-building activities ▪ Personnel exchanges and internships

5. PARAMETERS FOR COMPARISON OF RELATIONSHIP CONTRACTING ARRANGEMENTS

The literature study in Chapter 4 identified a number of formal and relational elements and governing mechanisms that should be present in a contract in order to cope with different situations such as diverging interests and information asymmetry, according to theory.

In this chapter these elements are first complemented with factors which stimulate the manifestation of high-performance teams, and thereby stimulate the occurrence of best-for-project behaviour which were identified in Chapter 3.3.6.
In the next section the formal and relational governing mechanisms and facilitators of best-for-project behaviour are combined, resulting in a list of parameters or contract clauses which should – in theory – be present in a contract in order to facilitate best-for-project behaviour.

The relevance of these parameters for achieving best-for-project behaviour will be assessed during the interviews in Chapter 7. After selection of the relevant parameters the list will then be adjusted and used to analyse and categorise various relationship contracting arrangements in Chapter 9.

5.1 FACILITATORS OF BEST-FOR-PROJECT BEHAVIOUR

Chapter 3.3.6 identified several facilitators of high-performance teams. These facilitators (see Table 12) also present an indication of elements that may be useful to adopt in the contract. They complement and partly overlap with the formal and relational governing mechanisms identified in the previous chapter.

Table 12: Deducing governing mechanisms from facilitators of best-for-project behaviour.

Facilitator	Governing mechanism
Common goals (Katzenbach & Smith, 2005; Nicholas & Steyn, 2012, p. 529; Robbins et al., 2013, pp. 312-322)	**Description of goals of project, agreement, parties**
Clear objectives, knowing what you aim to achieve (Katzenbach & Smith, 2005; Nicholas & Steyn, 2012, p. 529; Robbins et al., 2013, pp. 312-322)	
Performance evaluation (Robbins et al., 2013, pp. 312-322)	**Monitoring**
Reward system (Robbins et al., 2013, pp. 312-322)	**Payment**
Clear leadership and team structure (Robbins et al., 2013, pp. 312-322)	**Joint management organisation:** management structure, project teams, staffing, communication structure
Clear roles & tasks, knowing what you have to do and what others are doing (Nicholas & Steyn, 2012, p. 529)	
Equality: equal opportunity for participation (Anvuur & Kumaraswamy, 2007)	**Decision making:** decision making rules, mandates, responsibilities
Equality of group members (Anvuur & Kumaraswamy, 2007)	
No-blame culture, people can easily address each other (Anvuur & Kumaraswamy, 2007)	**Mutual liability waiver**

5.2 PARAMETERS

By aggregating and grouping the formal, relational governing mechanisms with those deduced from the facilitators of best-for-project behaviour the list of parameters in Table 13 is obtained. These parameters indicate the elements that should be present in a contract in order to foster best-for-project behaviour.

Table 13: The full list of parameters which should be present in a contract in order to foster best-for-project behaviour.

	Parameter	Relevance	Parameter origin*
Context and goals	Description of the parties involved	Makes explicit who the parties are, what their background is, and how they relate to each other.	RCT
	Explication of interest of project and parties	Forces parties to discuss and clarify the interests of the project, i.e. what is most important, and what the interests of the individual parties in the project are. Therefore it can become apparent whether interests are divergent and help to foster understanding of behaviour during the project.	RCT
	Description of goals of project, agreement, and parties	Forces parties to discuss the goals of the project, the individual goals of the parties, and what the agreement itself covers. This increases understanding of the project, the goals of the parties involved and the role of the agreement (contract).	BfPB RCT
	Putting goals of the project first	Stimulates parties to put the goals of the project first and to define a unitary focus which helps to align the parties.	BfPB RCT
Interaction	Inclusion of norms and values	Description of how parties want to be treated and intend to treat each other. Collaboratively establishing common norms helps to create ownership and prevent conflicts. Can also be in the form of a partnering/alliance charter.	RCT
	Mutual liability waiver	Necessary element to provide a psychologically safe work environment (a no-blame culture) in which people feel free to speak up, provide feedback, ask for help. This facilitates learning and optimisation, as well as exchange of information.	BfPB
	Mutual Early Warning	Bridges information asymmetry by obliging parties to inform each other as soon as they become aware of any potential issues.	P-A
Organisation structure	Joint management organisation	Defines the organisational structure, composition of management teams, establishes powers and therefore determines how parties relate to each other, whether they contribute on equal footing.	BfPB
	Duties and obligations	Description of roles and obligations creates clarity of who is responsible.	BfPB RCT
	Unanimous decision making	Creates joint responsibility and equality. Improves cohesion. Removes the impression of a dominant client (Chao-Duivis et al., 2007, p. 15).	BfPB
	Pre-agreed conflict resolution methods	Conflicts and litigation undermine the degree of trust between parties. By offering an alternative for litigation, parties can more easily work things out in a structured manner, without disrupting the project too much.	RCT

Remuneration	Payment	Aligns interests of contractor to those of the client. Reduces the need for monitoring.	P-A RCT
	Incentive structure	Aligns interests of contractor to those of the client. Reduces the need for monitoring.	P-A
	Sharing of pain and gain	Creates an incentive to help, since own interests will also be affected when a risk fires. Essential to make parties think along with each other (Chao-Duivis et al., 2007, p. 15).	BfPB
Monitoring & control	Performance measurement, KPIs	Control mechanism to monitor the performance of the project. Reduces information asymmetry.	P-A
	Transparency & openness	Providing openness helps to build trust. Openness is also necessary for learning, quick responses. Reduces information asymmetry.	P-A
Flexibility	Change procedures	Description of how changes to the contract can be suggested and implemented.	RCT
	Exit agreement	Description of the conditions under which the contract can be disbanded.	RCT
	* Legend: P-A = Principal Agent Theory RCT = Relational Contracting Theory	TCE = Transaction Cost Economics BfPB = facilitating best-for-project behaviour	

5.3 DISCUSSION

The list presented above composes an initial overview. It presents all aspects that should be addressed, according to theory. This includes both formal and relational elements. It still remains to be seen which of the parameters are really relevant and what their influence is for achieving best-for-project behaviour. This will therefore be further investigated during the interviews in Chapter 7.

Furthermore, the *presence* of a certain contract clause in a contract only means the contract addresses specific aspects of project practice. It does not however, guarantee that the desired best-for-project behaviour will in fact occur in practice. That means there is/are mediating factor(s).

Hence an initial model (see Figure 5 below) can be formed which will be tested during the interviews. Do specific contract clauses directly cause the achievement of particular aspects of best-for-project behaviour? It is also possible that this is achieved indirectly through mediating factors. Whether and how this relation occurs will further be investigated in Chapter 7.

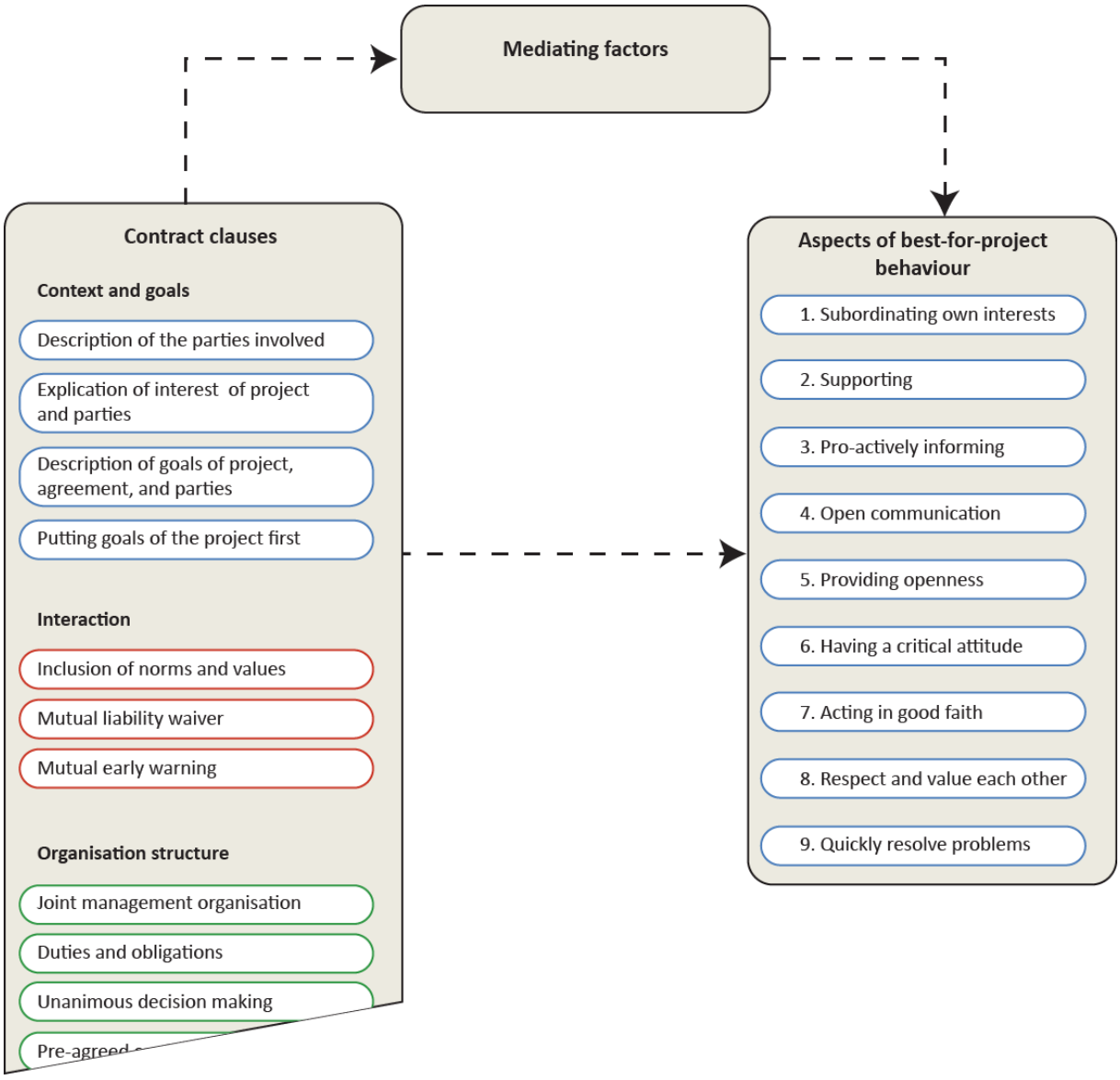


Figure 5: Model depicting the potential relation between contract clauses and aspects of best-for-project behaviour, albeit through mediating factors.

The next chapter will take a closer look at relationship contracting arrangements in practice. To that end a number of relationship contracting arrangements will be described, and a number of cases will be used to assess whether the list presented in this chapter is applicable to be used as a tool to compare and assess the set of relationship contracting arrangements. Based on the results of Chapters 6 and 7, the above list of parameters will then be adjusted for relevance in Chapter 8, before being used to make a comparison and categorisation of the various relationship contracting arrangements in Chapter 9.

PART III
RELATIONSHIP CONTRACTING ARRANGEMENTS IN PRACTICE

Chapter 6: Relationship Contracting Arrangements

Chapter 7: Case studies

6. RELATIONSHIP CONTRACTING ARRANGEMENTS

This chapter will discuss various forms of relationship contracting arrangements in order to answer the third sub question: *Which kinds of relationship contracting arrangements can be discerned in literature and practice, and what are their key characteristics?*

It starts by discussing the UAC-IC 2005 to establish a baseline for the Dutch construction industry, followed by a discussion of partnering in general as an umbrella term. Next a number of relationship contracting arrangements will be discussed, starting with project partnering and three specific implementations, PPC 2000 and JCT Constructing Excellence from the U.K. and Samverkan, the Swedish implementation of project partnering. Next project alliances and several implementations will be discussed, followed by a description of Integrated Project Delivery, NEC3, and Design Team. This chapter will conclude with a comparison of the various models.

6.1 UAC-IC 2005 (BASELINE)

The Dutch UAC-IC 2005, Uniform Administrative Conditions for Integrated Contracts, is a set of general terms and conditions for integrated projects. Since public clients in the Netherlands are legally obliged to use the UAC-IC 2005 for D&C projects, contractors in the Netherlands are very familiar with these standard forms of contract. Therefore they form a point of reference. The contract model itself cannot however be considered a relationship contracting arrangement.

6.1.1 Philosophy

The main principle for the UAC-IC 2005 is that the client plays a smaller role compared to traditional Dutch contracts (the UAC 2012) and thus holds less liability whereas the contractor's liability increases. The term integrated contracts is an umbrella term and encompasses a number of models: D&C, design & build (D&B), turnkey, design build finance maintain (operate) (DBFM(O)) and variations thereupon (Chao-Duivis, Koning, & Ubink, 2008, p. 26). Under the UAC-IC 2005 only one party (e.g. a contractor, architect, consulting engineer) is in charge of design and construction. (Chao-Duivis et al., 2008, pp. 99-100).

The model was developed to facilitate the integration of design and construction activities and offer an alternative for the traditional sequential organisation of construction activities (CROW, 2013).

The UAC-IC 2005 consists of a model agreement and general conditions, the UAC-IC 2005, which are complementary to each other. The UAC-IC itself contains the static general terms and conditions. The model agreement must be filled in and adjusted to the project in question. For some clauses of the model agreement there is a large degree of flexibility, in others there is only a choice between fully prescribed options which allows for a high or low involvement of the client during realisation of the project. The specifications which are drafted by the client have a central role in this respect. They can consist only of a program of requirements, but can also consist of a program of requirements plus a preliminary, and even the detailed design. Different parts of the project can also have varying levels of design freedom (CROW, 2013).

Since the client is supposed to play a limited role in design and construction of the project, he also has limited possibilities to influence the project. Active client involvement is still possible but

discouraged. The client's methods to influence the project include the definition of project specifications, ordering the contractor to implement changes, and the verification and acceptance procedures (Rijnders, 2014).

The UAC-IC also imposes a duty to warn for the contractor, and a duty to warn for the client. The contractor's duty to warn is more extensive since he is responsible for design and construction. A failure to warn the client (in writing) upon detection of error(s) in the client's specification, annexes, agreement, information, site, or goods provided by the client, or a change ordered by the client, will mean that the contractor is liable for the consequences (Rijnders, 2014, p. 18).

6.1.2 Field of application

The UAC-IC is applicable for small and relatively straightforward projects as well as large and complicated projects (CROW, 2013). It is used in particular for infrastructure construction, and increasingly for non-residential construction (Chao-Duivis et al., 2008, p. 100).

6.1.3 Results

There are no sources discussing the results of the UAC-IC 2005 in terms of improved project performance over other contract models. However, there is some criticism concerning the model. Most criticism regarding the UAC-IC 2005 concerns a supposed imbalance in risk allocation, i.e. too much risk is allocated to the contractor. This is mostly a consequence of the way the model is applied in practice. Risk allocation, and therefore also unfair allocation leading to disputes, is a choice of the client. The relatively small and more at arm's length role of the client can give a stronger impression of a hierarchical relation between client and contractor. In addition, the UAC-IC 2005 only arranges formal aspects. It does not for instance discuss the method of collaboration. Most problems and disputes can however be traced back to lack of knowledge and improper application (CE).

6.2 THE PARTNERING PHILOSOPHY

Partnering and sub forms such as project partnering and alliancing focus on cooperation as a means to achieve better project results (Kamminga, 2009). In literature, the term partnering is used to refer to a general approach as well as to refer to project partnering or strategic partnering. In order to avoid confusion, 'partnering' is used in this thesis to refer to the general approach, '*project* partnering' to refer to the implementation of the partnering approach in specific projects.

6.2.1 Philosophy

Partnering can be considered an encompassing term that covers a wide spectrum of contracting arrangements focused on cooperation (Kadefors & Eriksson, 2014). By itself it is not a contracting arrangement but a general approach or even philosophy. In other words, "partnering is best considered as embodying a set of processes and practices designed to promote cooperation between contracting parties." (Anvuur & Kumaraswamy, 2007, p. 225).

Partnering originated in the US in the 1990s as a response to the adversarial relations in the American construction industry which often led to litigation (Kadefors & Eriksson, 2014; Larson, 1995; Nyström, 2005). In the UK in the 1990s two well-known research commissions on the status-

quo of the English construction sector, one led by Latham in 1994 and the other by Egan in 1998, found similar problems. These reports have had a significant influence in a change towards using more collaborative approaches to overcome the adversarial relationships (Kamminga, 2008, pp. 82-84).

There are many different interpretations of the concept of partnering (Anvuur & Kumaraswamy, 2007; Bygballe et al., 2010; Kamminga, 2009), but an often used definition is that of the Construction Industry Institute (CII). They describe partnering as:

> *"A long-term commitment by two or more organizations for the purpose of achieving specific business objectives by maximising the effectiveness of each participant's resources. This requires changing traditional relationships to a shared culture without regard to organization boundaries. The relationship is based upon trust, dedication to common goals, and an understanding of each other's individual expectations and values."* (Construction Industry Institute, 1991)

Within the application of partnering a distinction can be made between Project Partnering and Strategic Partnering, of which the latter has a long-term orientation. Strategic partnering is sometimes regarded as the ultimate goal of partnering, the establishment of long-term commitment and collaboration. However in the construction industry, partnering is mostly applied in the form of project partnering (Bygballe et al., 2010).

Principle of partnering

The basic principle of partnering is thus "that parties work together as a team in order to achieve common business objectives" (Kamminga, 2008, 89). Furthermore they have the intention to continuously improve the collaboration process, and to act in the best interest of the project.
Larson (1995) compared definitions of partnering from a number of papers and publications and found two elements that were present in all definitions: trust and mutual understanding. Trust in the other party and understanding of and respect for the project partners' expectations and values are important supporting principles (Kamminga, 2008).

Project Partnering

Project partnering concerns the application of partnering principles to a single project. It originated in the United States at the US Army Corps of Engineers in the late 1980s. It concerns a voluntary agreement between principal and contractor. It was later transferred to the U.K. where it was applied from 1995 (Lahdenperä, 2012).

There are different implementations of the project partnering approach but the Project Partnering Contract (PPC) family (of which PPC2000 is discussed below) and the JCT-CE appear to be the only[4] contract models that incorporate the partnering principles into the contract agreement. In other cases the partnering principles are optional or put in a separate agreement (Lahdenperä, 2012). In this form, project partnering functions only as an additional layer and is not an independent project delivery method.

[4] In his paper on multi-party contracting, Lahdenperä (2012) only mentions the PPC family as a project delivery arrangement, since that is the only variant based on a multi-party approach. This seems to imply there are other mature variants as well but the author has been unable to find those.

The partnering charter is an often applied document used to establish the expectations of parties, also concerning soft factors such as the behaviour towards one another. By signing the document, parties "commit themselves to the partnering principles and promise to act in the best interest of the project" (Kamminga, 2008, p. 89). However, it is not legally binding.

The principles of project partnering

With the diverging interpretations of partnering there are also different views regarding the contents of partnering. Nyström (2005) combined those views (which are based on empirical research) and found that the two common elements of partnering are trust and mutual understanding. In addition he identified a number of optional elements that are named by some but not all authors. These elements are thus sometimes included in a specific variant, but in other cases they are not included. The optional elements are:

- economic incentive contracts,
- relationship building activities,
- continuous structured meetings to build and maintain relationships,
- provision of a facilitator,
- a well-developed method of selecting partners,
- predetermined dispute resolution/escalation plans,
- a culture of openness and transparency. (Nyström, 2005)

The different partnering variants thus all have the same core (mutual understanding and trust), whereas combinations of the optional elements define the different variants (Nyström, 2005), see Figure 6.

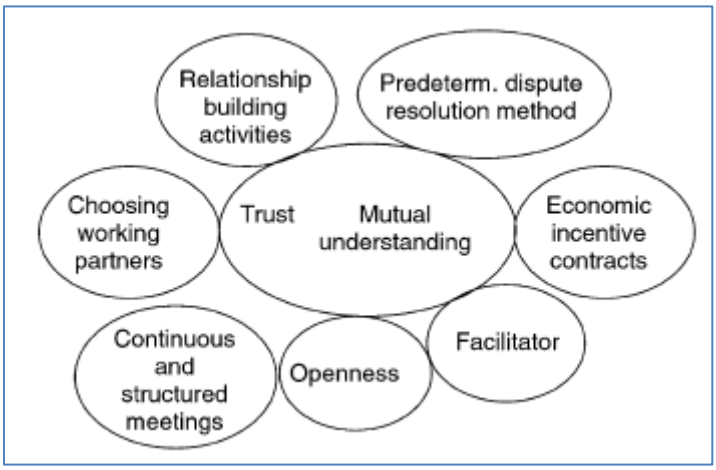


Figure 6: Partnering as a flower: two core principles and several optional elements (petals). Source: Nyström (2005, p. 478).

Hence implementation of partnering is achieved by adopting the core principles and one or several of the optional elements.

Partnering in practice

Since partnering is considered here as an encompassing term, it forms the basis for other relational contracting forms. These forms are listed below in Table 14. These different forms will be discussed in the next subchapters (6.3 – 6.9), with the exception of strategic partnering and strategic alliances which fall outside the scope of this research.

Table 14: Overview of relationship contracting arrangements

Forms of Relationship Contracting Arrangements

- Project partnering
  - PPC2000
  - Samverkan: Partnering in Sweden
  - JCT-CE
- (Strategic partnering)*
- Project Alliancing
  - Pure project alliance
  - Hybrid
  - Project design alliance
  - Mini alliance / Risk alliance
- (Strategic Alliancing)*
- Integrated Project Delivery
- NEC3 ECC
- Design Team (Bouwteam)

* Not in the scope of this thesis

6.2.2 Field of application

Partnering approaches can be used in any situation, but an important question is whether it will be worth the extra investment for relationship development and maintenance. Important aspects to consider are the size, design, cost, and duration of the project. Mostly these forms are used in projects that have some form of uncertainty, meaning an increased amount of risk. Relatively small or simple projects are less suited (Kamminga, 2008, pp. 119-121).

6.2.3 Results

Kadefors and Eriksson (2014, pp. 17-20) have researched the effectiveness of various partnering approaches by combining the results of several large quantitative studies from the primarily the U.K., Sweden, U.S.A., and Australia, including partnering, alliancing, and non-partnering projects. They conclude that major improvements can be achieved by adopting a partnering approach, but that no guarantees of a successful outcome can be given. Kamminga (2008, pp. 81, 121), after reviewing a number of papers, reached a similar conclusion: project partnering and project alliancing do not always lead to good project performance.

Criticism & limitations of partnering

There is quite some criticism on the partnering approach, which is likely also related to the fact that partnering is such a diffuse concept. Project partnering is often described as just common sense and a hype (Larson, 1995; Nyström, 2005). There is also a problem of causality. Can the positive results of a project be attributed to the application of project partnering, or any of the other numerous factors that can influence project results?

There are potentially conflicting processes at work. If public work contracts are awarded on open, competitive, low-bid basis, a party can be selected that is not willing to adopt the partnering

principles (Larson, 1995). Kamminga (2008, pp. 119-121) identified a number of barriers or obstacles that have to be overcome before the benefits of project partnering can be achieved. Parties have to be willing to give up some of their independence, be willing to share information, put their trust in the other party, invest in developing communication routines, be willing to take the interests of the other party into account, and treat the other party as equal.
Even if those obstacles are dealt with, there are still restrictions in procurement law that limit the possibilities of a public party to develop a long-term relationship with a contractor. This makes strategic partnering and strategic alliancing nearly impossible. Only by taking experience in previous projects (past performance) into account when tendering a new project can some sort of long-term relation occur (Kamminga, 2008, pp. 108-119).

Thus significant limitations will still apply. There will always remain some opposing goals between principal and contractor despite the optimistic intentions the parties may have. Some issues may be difficult to fully resolve and some tension can remain. Furthermore, there are limits to the amount of trust that can develop. Some information may still be held back, despite agreements to share. Significant changes to the culture are required, but these changes will not come about suddenly. A partnering approach can thus fall victim to the lingering adversarial culture (Kamminga, 2008, p. 120).

Finally Bygballe et al. (2010) note that the implementation of partnering has not yet delivered the positive results that were expected and ascribe this to the focus on the relation between client and contractor, while disregarding the sub-contractors and suppliers. Since a large degree of the work is usually performed by subcontractors, the same adversarial relationships which the partnering between client and contractor aims to prevent can still occur. This calls for the inclusion of subcontractors into a project partnering agreement.

6.3 PPC 2000

PPC2000, which stands for Project Partnering Contract, is a standard form of contract established in the UK. It followed directly on an investigation into the British construction industry, the Government's Construction Task Force Report "Rethinking Construction" (Trowlers & Hamlins, 2005) and can be considered a form of project partnering in which the partnering principles have been adopted into the contract (Lahdenperä, 2012).

6.3.1 Philosophy

PPC2000 aims at achieving better integration of parties in primarily the procurement phase. It uses a single multi-party contract that combines all relevant parties (contractor, consultant, and important specialist sub-contractors) under one contract, instead of having separate contracts with all parties. This encourages alignment and commitment of all parties to the project and also makes clear the agreed upon obligations of one party to all other involved parties (Saunders & Mosey, 2005). This is further aided by early contractor selection and involvement, which enables collaborative finalisation of design, price setting, and selection of additional parties.
PPC2000 also includes a core group (management team) representing the project partners, which monitors progress and serves as early detection of problems, and makes decisions by consensus. The standard also includes establishing incentives for shared savings or performance incentives, and

establishes a scheme for dispute resolution. It also recognises the role of a partnership advisor which can act as a mediator in case of disputes (Trowlers & Hamlins, 2005). Thus PPC2000 has a particular focus on a multi-party agreement, early contractor involvement, and dispute resolution including an option of appointing a partnership advisor who can act as a mediator which reduces the need for litigation.

6.3.2 Field of application

PPC2000 is mostly used for construction and refurbishment of education and healthcare facilities, offices, leisure and hotel facilities, and housing construction. It does not appear to be used for infrastructure construction (ACA, n.d.).

6.3.3 Results

There appears to be no scientific investigations into project performance under PPC2000 contracts, despite a substantial contract sum of several billion pounds per year. Nevertheless, a number of benefits can be attributed to application of PPC2000. By having a single multi-party contract there is no overlap between obligations of project partners, and hence no confusion. Better synchronisation of timetables should become possible and early (sub-) contractor involvement enables optimisations and innovations, more accurate cost estimation, and early establishment of project teams. It achieves a higher level of integration than achieved using NEC3 (Saunders & Mosey, 2005).

PPC projects have a total throughput of several billion pounds a year and appear to be successful in the application of partnering principles. After 10 years of application, “no PPC project has been to litigation or arbitration, and only a handful have been to adjudication” (Mosey, 2010). The contract model itself was evaluated positively in an extensive partnering contract review (Davison & Ryan, 2008).

6.4 JCT Construction Excellence

The JCT (British Joint Contracts Tribunal) contract suite originates in the U.K. where it is applied in roughly 70% of all construction projects. The ‘JCT – Construction Excellence Contract’ (JCT-CE) is intended for increased collaboration. It was published in 2006 and consists of three documents: the contract, the optional project team agreement (resembling a multi-party design team agreement, see chapter 6.7), and a guide.

6.4.1 Philosophy

JCT-CE emphasises the importance of collaboration through its ‘overriding principle’ (section 2.1). It requires parties to have the ‘intention to work together with each other and with all other project participants in a co-operative and collaborative manner in good faith and in the spirit of mutual trust and respect’ (Nabarro, 2012). There is also a duty to warn each other and provide progress and performance updates. This overriding principle also necessitates parties to openly provide information to each other.

The contract model includes establishment of a Project Team composed of client, lead designer, lead supplier, and other relevant suppliers. The project team gives advice on a number of issues, but cannot issue instructions.

The JCT-CE contract also suggests (but does not force) parties to establish a partnering charter in the form of a non-binding 'project protocol' in which parties can make an agreement about the goals to be achieved, how to develop working relations between the parties involved, and how to deliver the project (Griffiths, 2009, pp. 37-38).

The agreement can be extended to become a multi-party agreement by adding the Project Team Agreement (PTA). This is a multilateral agreement which includes rules on conflict resolution and also includes an optional mechanism for sharing of pain and gain. The PTA is an addition to the contract and formalises the relations between the different parties. In section 2 of the PTA the parties reaffirm their commitment to the overriding principle. They promise to work "in a collaborative manner in good faith and in the spirit of mutual trust and respect. To this end, each of them shall give to, and welcome from, the others and the other Project Participants feedback on performance, shall draw each other's attention to any difficulties and shall share information openly, at the earliest practicable time. They shall support collaborative behavior and address behavior that does not comply with the Overriding Principle" (Van Wassenaer & Thomas, 2008, pp. 86-87). Furthermore, it extends the role of the Project Team to have regular meetings, exchange information, evaluate the design and construction process, update the risk register, assess the performance of project participants (using the KPI's), aim to mitigate special circumstances, investigate the potential for optimisations, and improve exchange of information between participants (Van Wassenaer & Thomas, 2008, pp. 86-87). It also contains an exclusion of liability concerning contributions or not providing comments on each other's work, similar to a design team.

Lastly, there are two payment options available, target cost with an option for a guaranteed maximum cost, or lump sum. There is also a provision of 'risk and reward sharing provisions' in the Project Team Agreement. In case of a target cost, a Project Target Cost is jointly established and parties share in profits or losses (similar to the TOC and sharing of pain and gain in alliances) (Van Wassenaer & Thomas, 2008).

6.4.2 Field of application

Given the involvement of the supply chain through the multi-party Project Team Agreement, it seems in particular interesting for situations in which early contractor involvement is deemed beneficial.

6.4.3 Results

No sources could be found to illustrate the results of application. According to Van Wassenaer and Thomas (2008) this contract model forces parties to address a number of important issues, primarily the allocation of risks. It also forces participants to make agreements concerning project goals and principles for the collaboration. Finally it includes provisions for risk and reward sharing. The contract model itself was evaluated positively in an extensive partnering contract review (Davison & Ryan, 2008).

6.5 SAMVERKAN: PROJECT PARTNERING IN SWEDEN

In Sweden, the partnering approach has also been adopted as of 2006 to accomplish a fundamental change in their construction sector and achieve better project performance. Travikverket, the Swedish Transport Administration responsible for road, rail, shipping and aviation, has been implementing what they call Samverkan which consists of three levels (see Figure 7).

6.5.1 Philosophy

Similar to most partnering approaches, the Samverkan approach is not an independent project delivery system. It functions as an additional layer on top of a project delivery system such as D&C. The approach involves a structured implementation of several partnering elements. The usage of levels 1-3 might give the impression that a higher level is more desirable, but this is not the intention.

Level 1 consists of 6 compulsory elements and is an improvement on the traditional form of cooperation. It emphasises the implementation of (1) a joint project organisation (preferably with co-location on site), including a steering group, collaboration group, appointing a Samverkan manager to facilitate the cooperation process, defining roles and responsibilities and holding workshops to discuss e.g. common goals, work processes, relations, communication, but also to allow informal talks. Furthermore it includes (2) jointly setting goals and establishing the methods to achieve those goals, establishing a cooperation plan, (3) joint risk management, (4) setting up conflict resolution methods, and (5) continuously monitoring project performance. Finally, depending on the chosen remuneration scheme, (6) transparency concerning expenditures of the contractor (FIA Sverige, 2006, pp. 12-17).

Figure 7: Samverkan in Sweden. Adapted from FIA Sverige (2006, p. 2), translated by author. (AB, ABT, ABK refer to the Swedish general terms and conditions.)

Level 2 consists of 8 optional elements which can be implemented based on the particularities of the project in question. These elements concern more intensive goal management and performance management, development of skills, more intensive stakeholder communication and involvement, and increased team building efforts (FIA Sverige, 2006, pp. 17-19).

Finally, level 3 refers to Strategic Alliances, which is difficult to implement in practice given the rules on public procurement. It can only be used in special cases (Holmberg & Roos, 2013, p. 9).

6.5.2 Field of application

Samverkan is being implemented in projects that meet one of the criteria in Table 15. The base level is a requirement for larger projects. The optional elements are intended for large and complex projects.

Table 15: Overview when Samverkan must be applied. Source (Trafikverket, 2015)

Project duration/size	Required approach*
Over 1 year	Base level + Samverkan manager
Less than 1 year, but Over 10 MSEK (€ 1 000 000) in construction Or over 1 MSEK (€ 100 000) in design	Joint goal setting / performance management Joint risk management Conflict resolution methods
Less than 1 year	Free to choose
**Any deviation must be justified and approved by management.*	

6.5.3 Results

The implementation of Samverkan base level should support the development of trust and motivation, and helps to prevent conflicts. The Samverkan program is still under development, and unfortunately no clear evaluation could be found.

6.6 Project Alliances

There are several implementations of project alliances. Therefore the general project alliancing philosophy will first be discussed. Afterwards various implementations will be discussed. The pure project alliance from Australia, hybrid project alliances, the project design alliances which are used in the Netherlands, and the mini or risk-alliance.

6.6.1 Philosophy

Project alliances can be regarded as a project delivery arrangement that incorporates many of the relationship contracting principles. In short, alliances focus on fostering an atmosphere of openness and trust by aligning the interests of the participants through a shared risk and reward mechanism (Love et al., 2010; Sakal, 2005; Walker et al., 2015). Project alliances are contracts between client and contractor, but can also include other parties that are critical for the end-result.

A commonly used definition of project alliances is given by the Department of Treasury and Finance Victoria (2010, p. 9): *"Alliance contracting is delivering major capital assets, where a state agency (the Owner) works collaboratively with private sector parties (Non-Owner Participants or NOPs). All parties are required to work together in good faith, acting with integrity and making best-for-project decisions. Working as an integrated, collaborative team, they make unanimous decisions on all key*

project delivery issues. (…) All parties jointly manage that risk within the terms of an 'alliance agreement', and share the outcomes of the project".

A very important and discerning aspect of Project Alliances is the allocation of risks. Where under traditional contracts all risks are allocated to either client or contractor, under an alliance at least part of the risks become the responsibility of the alliance and therefore the responsibility of all participants in an alliance. This is formalised by tying the profit of the project participants to the outcome of the project through sharing of pain and gain (although usually pain sharing is capped for the non-owner participants). After completion of the project, the actual costs are compared to the budgeted costs and savings are returned to alliance participants using a pre-established ratio, whereas shortages must be supplied by participants (Chao-Duivis et al., 2007; Koolwijk, 2010; Lahdenperä, 2012; Sakal, 2005; Walker, Hampson, & Peters, 2002). Hence the profit of all parties is tied to handling the risks in a way that is best for the project. This is sometimes referred to as a sink-or-swim mind-set. This risk sharing is intended for difficult to control risks that would likely lead to confrontation if allocated to a single party (Laan et al., 2011).

The alliance is run by an 'alliance board' also known as the 'alliance leadership team' which holds final responsibility. Both parties are equally represented in this board, usually by 2 members from both sides. The chairman of this board is appointed by the client, the vice president by the contractor. Decisions are made unanimously (Chao-Duivis et al., 2007, pp. 50-51). In addition there is an alliance management team which is concerned with daily operations for the project, chaired by an alliance manager, see Figure 8.

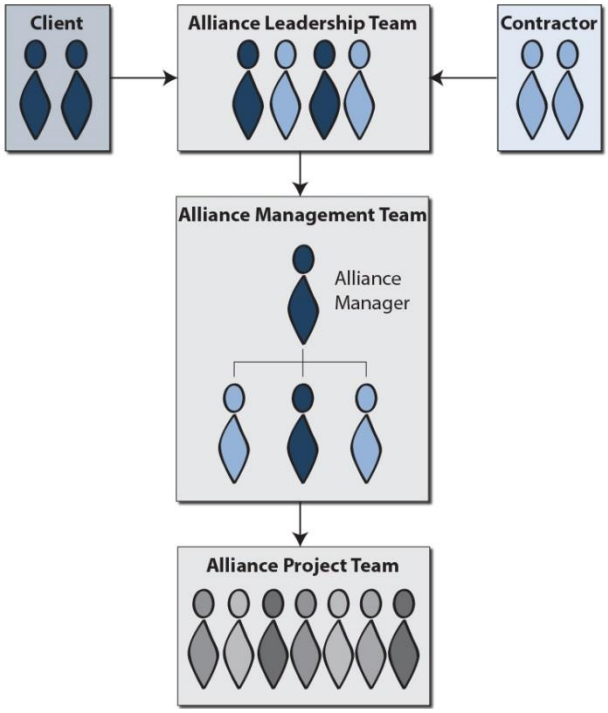


Figure 8: Alliance management structure. Adapted from Department of Treasury and Finance Victoria (2010, p. 20)

Another key element that sets Project Alliances apart from other relationship contracting arrangements such as project partnering, is that the principles which foster collaborative behaviour are made explicit in the contract (Walker et al., 2015). A third element is a no-blame culture. Parties agree to share responsibility but furthermore agree, contractually, that since no party is solely

responsible it cannot blame the other party for any failures except in case of gross misconduct. This no-litigation clause works together with the clauses concerning joint and unanimous decision-making (Koolwijk, 2010; Lahdenperä, 2012; Langfield-Smith, 2008; Lloyd-walker et al., 2014; Walker et al., 2015). Finally, trust is increased by having open book accounting which gives the client full overview of the contractor's expenses (Koolwijk, 2010; Sakal, 2005; Walker et al., 2002).

6.6.2 Project alliance models

The Australian (Pure) Project Alliance

The Australian model combines all the above principles in one integrated contract. Under the pure project alliance the alliance members are responsible for designing and delivering the entire project. Apart from risk and opportunity sharing, joint management structure, and unanimous decision making, particular attention is also given to a commitment to 'no disputes', a no-blame culture, and 'good faith' and integrity as general behavioural principles.

COMMITMENT TO 'NO DISPUTES'

In order to avoid the adversarial claims-based culture of the traditional contracts, the pure project alliance also adopts a no-litigation clause in which alliance participants agree not to sue each other except in limited circumstances such as cases of gross misconduct. This forces people to work out any problems within the structure of the project. This no-litigation clause supports the establishment of a no-blame culture (Department of Treasury and Finance Victoria, 2010, p. 15). However, it is questionable whether the no-litigation clause will really hold in court (Chao-Duivis et al., 2007, p. 11).

NO-BLAME CULTURE

The no-blame culture is more strongly emphasised than in the Dutch project design alliances (described later). Lloyd-walker et al. (2014, p. 233) describe it as a culture "in which individuals do not fear repercussions from risk taking or problem identification, where employees feel free to contribute to discussions and raise issues. (…) [It] encourages open communication, [and] sharing of knowledge thus helping to release organisational knowledge residing within interactions between people." This description has a strong resemblance of the atmosphere of psychological safety discussed in Chapter 3.3. A no-blame culture improves exchange and thus enables the ability to learn. It also makes parties focus on solving a problem instead of assigning blame.

'GOOD FAITH' AND INTEGRITY

The obligation to act in good faith is quite elaborate in the pure alliance model, but it relates to all other principles and influences behaviour. It includes an obligation to cooperate to achieve the objectives, to act conform reasonable standards of conduct, taking the interests of other parties into account, and to act fairly and not derive benefits at the expense of others.

The importance that is adhered to 'acting in good faith and with integrity' is related to the absence of such a principle in common law. Therefore this principle is not found so prominently in the Dutch project alliances.

TRANSPARENCY

Parties have access and audit rights for the documentation of their project partners. This is related to the compensation structure. The client should be able to know whether the costs the contractor

wants to be reimbursed for have actually been made and whether they are accurate (Department of Treasury and Finance Victoria, 2010, pp. 18-19).

COMPENSATION STRUCTURE

The standard remuneration model consists of three components, see also Figure 9:

1. Reimbursable costs: all direct project specific costs, including rework, and project overhead for all alliance members. These fees are fully transparent via open-book accounting.
2. Fee: corporate overhead and profit, usually a percentage of the target costs.
3. Bonus: from sharing of pain and gain, using a pre-established ratio.

The payment for reimbursable costs is guaranteed for the contractor. This means he will always be paid for direct expenses for the project.
The size of the bonus (or malus) is determined by comparison of the 'target outturn costs' (TOC) with the 'actual outturn costs' (AOC). The TOC is established collectively by the parties during project development. This TOC serves as a benchmark for the final costs, the AOC. If the costs are lower than expected (AOC < TOC) the parties share the savings. If, on the other hand, the actual costs turn out to be higher than the expected costs (AOC > TOC) the parties will have to share the losses. The losses for the contractor are capped at the amount of the fee (2nd component).

This system can be supplemented by additional incentives for specific areas that the client finds important (Key Result Areas) for which specific Key Performance Indicators (KPIs) are used (Department of Treasury and Finance Victoria, 2010, pp. 45-61; Sakal, 2005).

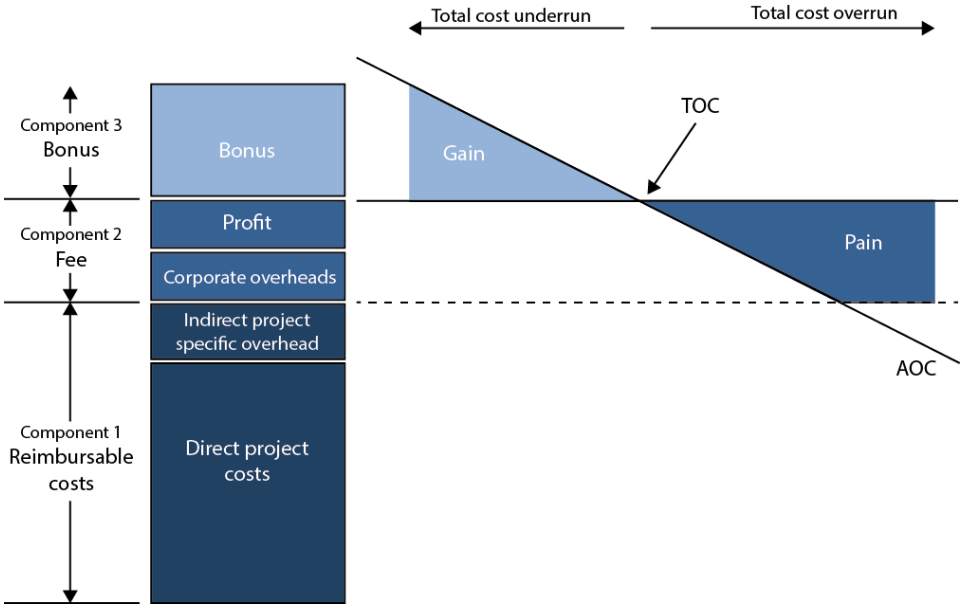


Figure 9: Compensation structure of pure project alliance. Adapted from (Chao-Duivis et al., 2007, p. 74) and (Department of Treasury and Finance Victoria, 2010, p. 49)

Hybrid project alliance

The term 'hybrid project alliance' also originates from Australia, where a distinction is made between pure alliances and those alliances that deviate from the alliance principles. These deviations concern e.g. incorporation of non-consensual conflict resolution methods such as binding arbitration, capping

the project costs for the client (thus limiting the risk for the client), having an 'alliance contractor' who is responsible for execution of the project with limited input from client (i.e. no equitable input from alliance parties), limiting the no-dispute clauses, and allocating specific risks to one party instead of sharing all risks (Queensland Government Chief Procurement Office, 2008, p. 10).

The Dutch alliances by Rijkswaterstaat and ProRail can also be considered hybrid alliances since they allocate most of the risks to either client or contractor and therefore only share a limited amount of the risks (Koolwijk, 2010). They are considered here as a separate group, the Project Design Alliance.

Dutch Project Design Alliance

The main characteristic of a project design alliance is that there is a clear separation between the design phase and the construction phase, which is a significant deviation from the pure project alliance model. This separation is related to the way the alliance is procured. The project can be tendered as a D&C contract, with the option of establishing an alliance later on for the design phase plus some additional risks. This also serves as a safety net in case negotiations for an alliance fail (Chao-Duivis et al., 2007, p. 13). This would not be possible in case of a pure project alliance. More recently, these alliances are also directly tendered as project alliance.

The design is made in an alliance by the client and contractor together for which they both share responsibility. However, for the construction phase a standard construction contract is made. The alliance operates as the client during the construction phase for which it has a separate construction contract with that same contractor. Some risks are shared in the alliance. This includes risks related to design errors, plus some risks that are difficult to allocate to either client or contractor.

The alliance (as an entity) is thus responsible for the design and the contractor is responsible for the construction. In theory the contractor then has an incentive to blame errors during the construction phase on the design so he will only have to bear half the costs. The alliance itself is responsible for monitoring the contractor, but personnel of this contractor are also part of the alliance team. This means there is potential for opportunistic behaviour (Chao-Duivis et al., 2007, pp. 46-47).

COMPENSATION STRUCTURE

The remuneration scheme (see Figure 10) is also different from the pure project alliance. This difference is related to the separation between design and execution. Sharing of pain and gain is still the main principle. However, in the project design alliance a separate alliance fund is used.

This alliance fund covers the costs of establishing the design, the costs of the alliance organisation, and a risk budget to handle the shared risks plus any unforeseen risks. Increased costs as a consequence of risks during project execution are deducted from the alliance fund. Savings are added to the alliance fund. At the end of the project, the balance of the risk fund is shared between parties. Deficits are usually capped for the contractor, meaning that if the deficit is large, the client will have to cover a larger share of these shortages. The remuneration scheme is thus setup to be the incentive for parties to perform and to seek optimisations (Chao-Duivis et al., 2007, p. 13).

The separate contract for the construction phase is based on the UAC-IC 2005 and has a separate fixed price for the construction phase, similar to a standard contract which only covers construction.

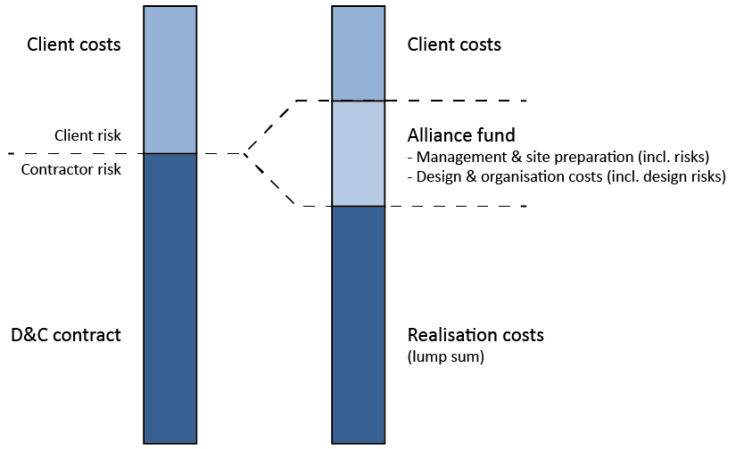


Figure 10: Compensation model of the ProRail Alliance. Adapted from (Chao-Duivis et al., 2007, p. 70).

Mini-Alliance or Risk-Alliance

A mini-alliance or risk alliance concerns the implementation of the pain/gain-sharing principle for part of a project, without requiring a complete alliance organisation. It is applied as an additional clause in existing project delivery systems such as D&C and is thus not an independent project delivery system. It allows for collaboratively searching for optimisations that may be more difficult to realise by the parties individually (Kamminga, 2009; Marijnissen, 2014, p. 11). The standard D&C contract of ProRail contains two optional clauses covering risk sharing (article 25) and sharing in the benefits of an optimisation (article 26). For the risk alliance parties share the responsibility of specific risks that cannot be easily divided between them and the contractor is paid a predefined fee for any additional activities required (ProRail, 2014). Unlike the previously described project alliances, there is no special alliance board or alliance management team, nor any extensive clauses concerning openness or liability waivers.

Table 16 shows a short comparison of the alliance models described above.

Table 16: Short comparison of the different forms of project alliances

Aspect	Pure	Hybrid	Design Alliance	Mini alliance
Principle	Sharing of (nearly) all risks	Small deviation(s) from pure model	Only an alliance for the design stage	Only pain/gain sharing without management structure
Phases	All phases	All	Design only	(Not indicated)
Sharing of pain and gain	All activities (capped)	All - Some activities (capped)	Only some activities (capped)	Sharing limited risks (capped)
Management	ALT, AMT	ALT, AMT	ALT, AMT	-
Liability waiver	Yes	Yes/No	No	No

6.6.3 Field of application

Project alliances have a more complex and expensive organisational setup (Langfield-Smith, 2008; Walker et al., 2002) and complex interfaces, making it mostly suited to projects with a high degree of uncertainty (Walker et al., 2015).

6.6.4 Results

Under a project alliance parties are stimulated to collaborate to a larger extent than in other procurement forms. This eases processes and communication, leading to increased flexibility when dealing with uncertainties, and better facilitates innovation. The contractual no-litigation clause and joint decision-making excludes the possibility of prosecution, which forces parties to work out their differences and avoids lengthy and costly disputes (Chen et al., 2012; Walker & Lloyd-Walker, 2015). As a result, application of project alliances leads to better results in terms of cost, time, and quality than generally achieved with traditional procurement forms (Chen et al., 2012; Walker et al., 2015).

6.7 INTEGRATED PROJECT DELIVERY (IPD)

Integrated project delivery originated in the USA and is similar to project alliancing and project partnering. It is also based on a relationship based approach (AGC, AIA, APPA, COAA, & NASFA, 2010).

6.7.1 Principles

IPD uses similar principles as project alliances: "Integrated project delivery (IPD) seeks to improve project outcomes through a collaborative approach of aligning the incentives and goals of the project team through shared risk and reward, early involvement of all parties, and a multiparty agreement" (Kent & Becerik-Gerber, 2010, p. 815). There is a standardized structure, but also a 'light' approach by implementing only part of the principles. The main principles include: a multiparty agreement, shared risk and reward, and early involvement of all parties. Other principles include trust, mutual respect, collaborative decision making, early goal definition and intensified planning, and open communications. IPD has a tiered approach consisting of three levels. A distinction is made between IPD as philosophy and IPD as a project delivery system. Level one represents a traditional situation, level two implements some of the principles (collaboration explicated in the contract, team co-location, and some team risk sharing), and level three is achieved by implementing all the principles (AGC et al., 2010).

Many clients have used at least some of the principles complementary to traditional, transaction-based contracts. However, in order to reach the full benefits of an integrated team, the contracts themselves also have to change, or a new contract (IPD) must be applied. This contract should then be relationship based (AGC et al., 2010).

IPD Standard form of contract

There are some standard form agreements that comply to the different levels. Interestingly, alliancing is referred to here as incorporating the IPD principles. Two American organisations have published their version of an IPD standard form of contract. 'ConsensusDOCS 300: Tri-party Collaborative Agreement' and 'AIA C191-2009' refer to an agreement between owner, contractor, and respectively designer or architect. Both incorporate the principles of risk-sharing and joint decision making. However, the AIA C191-2009 standard form of contract only incorporates gain sharing, while there is an option to not reimburse a contractor for additional labour costs when the target cost exceeded.

The AIA C191-2009 standard form of contract contains a few clauses which only describe an obligation (and processes) to collectively define the content of the clauses. For example, the project

definition, project goals, risk matrix, and software to be used. The organisation structure is similar to the project alliances with a Project Executive Team and Project Management Team.

6.7.2 Field of application

IPD has a strong coupling with BIM (Building Information Model) and the architect has a central role in IPD as one of the parties in the contract (AGC et al., 2010). It also emphasises early involvement of subcontractors. Hence IPD seems more attuned to building projects such as hospitals that require integration of various technical systems. Early subcontractor participation is especially important in those cases (Lahdenperä, 2012; Walker & Lloyd-Walker, 2015).

6.7.3 Benefits & results

The expected benefits are similar to those for alliancing and project partnering. Through better collaboration in the design and construction process, project performance will improve. Application has been relatively limited so far. Consequently there is not yet much experience but the initial results are positive (AGC et al., 2010; Kent & Becerik-Gerber, 2010). Overall, integrated project delivery is not a fully mature and proven project delivery method (Kent & Becerik-Gerber, 2010).

6.8 THE NEW ENGINEERING CONTRACT (NEC3 ECC)

The 'New Engineering Contract' (NEC) is a family of contracts that originated in the United Kingdom. The NEC3 family contains a large number of contracts for a variety of situations. It therefore encompasses contract forms which are developed separately in the Netherlands (UAC 2012, UAC-IC 2005, Design Team, The New Rules (DNR)). Therefore all contractual relations can use the same contract family and terminology. Only the Engineering and Construction Contract (ECC) standard form of contract is considered here.

6.8.1 Principles

The NEC3 ECC is set up to provide a stimulus for good management through a number of mechanisms: an explicit requirement to collaborate, encouraging early warning, clear risk allocation through the main options, a clear and consistent approach to compensation events, and using up-to-date risk, planning, and cost management tools.

The primary characteristic of the NEC3 is a strong focus on trust and cooperation. This is already made clear in the first article (clause 10.1) of the contract, which reads: *'The Employer, the Contractor, the Project Manager and the Supervisor shall act as stated in this contract and in a spirit of mutual trust and co-operation.'*
By entering into contract, the parties promise each other to act in the way as set out in the various clauses of the contract, and in addition in a spirit of mutual trust and co-operation, a mechanism which is absent in common law. Failure to do so would mean a breach of contract. However, there is no clearly defined meaning for the phrase 'in a spirit of mutual trust and co-operation' (Rowlinson, 2015, pp. 19-22)

Secondly, the contract is intended to be clear and simple. It is written in plain non-legal English which makes it easier to understand. Therefore it is also comprehensible by the people who have to use the

contract in daily practice and hence should be able to understand their rights and obligations (Van Wassenaer & Thomas, 2008). Furthermore the drafters of the model have decided not to use any cross-referencing which is a strong diversion from other contracts. Consequences of a failure to do something can be listed in a separate clause without being referred to in the initial clause.

The ECC emphasises good communication as a necessary facilitator for mutual trust and cooperation. Therefore the contract identifies the formal communication methods to be used. Although this clause does discourage (crucial) informal face-to-face communication by stating that all communication should be in writing (Rowlinson, 2015, pp. 39-40).

The ECC furthermore stimulates the use of foresight through the use of an Accepted Programme (as a planning tool) and a mechanism of early warning (clause 16) to share any foresight the parties might have (Rowlinson, 2015, pp. 40-41). The latter concerns an obligation to inform each other as soon as possible in case of impending cost overruns, delays, or problems with quality. Parties are then obliged to jointly formulate a response at a risk reduction meeting (Van Wassenaer & Thomas, 2008). This helps parties to focus on resolving an issue before it becomes a problem.

The options provided by the NEC3

By offering various main options and secondary options, the NEC3 ECC contract is adjustable to a wide range of engineering and construction work, with a varying design responsibility of the contractor (from no to full design), different risk profiles through various remuneration schemes, and is independent of legal context. The NEC3 offers are six main options (A-F) which determine the risk profile for the project through the different payment mechanisms. Option A carries the least risk for the client, while option F carries the highest risk for the client.

- *Option A: Priced contract with activity schedule.*
  An activity schedule contains the activities the contractor intends to perform. These activities have been priced by the contractor in his tender. The client will pay the contractor according to the prices in this tender.
- *Option B: Priced contract with bill of quantities;*
  The contractor is paid for the quantity of work at the rates defined in the bill of quantities. The rates and percentages in the bill of quantities are fixed by the tender, whereas the amount of work can differ.
- *Option C: Target contract with activity schedule;*
  The contractor tenders a target price based on a list of activities with associated prices and percentages. These rates are used to calculate the actual costs during execution of the contract. When the actual total costs are lower than the target price the contractor receives a share of the gain. When the actual costs exceed the target price contractor will have to pay a part of the overspend. The client and contractor share the difference according to a previously established ratio. Hence they share in the savings/additional costs.
- *Option D: Target contract with bill of quantities;*
  This option uses a similar approach as option C, but instead of an activity schedule uses a bill of quantities. The client carries more risk than under option C.
- *Option E: Cost reimbursable contract;*
  The client pays for all the costs made by the contractor

- *Option F: Management contract;*
  the contractor is paid a fee for carrying out specific prescribed duties. He enters into contract with the subcontractors and is paid for the work carried out by the subcontractors. His fee increases as the work by the subcontractors increases.

In addition to the main options, there are a number of optional secondary options which include among others an option for partnering (X12) which is the most relevant in this thesis. The X12 option includes the establishment of a Core Group (steering group), and additional partnering aspects. It can also be used to facilitate closer interaction with subcontractors (Rowlinson, 2015, pp. 13-18).

The addition of the X12 partnering option enhances the NEC3 ECC from being a contract with collaborative elements into a contract that places collaborative construction practices at the centre of the relationship between parties (Davison & Ryan, 2008, p. 16).

6.8.2 Field of Application

The NEC3 model is a modular system with various options which make it suitable for many different projects (Van Wassenaer & Thomas, 2008). It is widely adopted in the U.K., New Zealand, Australia, Hong Kong, and South Africa, for civil engineering, electrical, mechanical work, and building construction. To the author's knowledge, the first and only project in the Netherlands which has used the NEC3 up to date is the International Criminal Court in The Hague (discussed in the next chapter).

A target cost contract is applicable when the costs cannot accurately be predicted beforehand, or certain risks can better be shared.

6.8.3 Benefits & Results

In the first 10 years of application, there had only been two court cases which were a consequence of too large deviations from the NEC3 model (Van Wassenaer, Thomas, & Van Geen, 2007). The contract model itself was evaluated positively in an extensive partnering contract review (Davison & Ryan, 2008).

6.9 DESIGN TEAM

The Design Team (Dutch: Bouwteam) model is a Dutch contract model that focuses on early involvement of the contractor in the design phase in order to achieve a better, more realistic design. It covers only the design phase; a new construction contract is established for the construction phase. A model contract exists in the form of the 'VGBouw Model Bouwteamovereenkomst 1992'.

6.9.1 Principles

The design team is initiated to further develop a preliminary design into final specifications (Dutch: bestek). It involves a temporary partnership between client, architect, contractor, and any relevant subcontractors or advisors. The contractor acts in this case as a consultant for execution.

The client holds a central position as the head of the design team, although he is usually represented by another person (architect or specialised consultant). The client has separate contractual relations with all parties. In addition there is a coordination agreement between the members of the design team. Contrary to integrated contracts the client is still in a central position. The client-contractor relation in the construction phase is traditional.

Another characteristic that distinguishes the design team from integrated contracts is the separation between the design and construction phase. The contractor who advises in the design phase is given the first possibility to give a quotation for the execution of the works. He is likely the one who will be awarded the contract for construction, but there is no guarantee. Only if after fair negotiations the client and contractor cannot reach an agreement on the price, can the client start negotiations with other contractors.

Parties give advice to other design team members on top of their own consultancy tasks. Liability of a particular idea rests with the party whose expertise it was, or who adopted the idea if it was not his own. For instance, an architect contributes an idea that relates to the contractor's area of expertise, the contractor adopts the idea and thus also becomes liable for it.

The contribution of the design team members is arranged through equality of its members. This equality must ensure that there are no boundaries to contribute ideas and offer critique on proposals from others (i.e. the psychological safety introduced in chapter 3). However, it only applies to equality between members other than the client, who has a dominant, leading position due to its central role (Chao-Duivis et al., 2008, pp. 25, 83-98).

6.9.2 Field of application

The Design Team appears to be primarily intended for the design and construction of complex buildings. It is currently not in use for infrastructure projects.

6.9.3 Benefits

The added value for the client is the contribution of the expertise of the contractor which saves costs through refinement of the design and fewer adaptations necessary between the design and construction phase. There is also the possibility to commence work sooner, thus limiting the gap between design and construction. The benefit for the contractor lies in an increased chance of being awarded the construction phase (Chao-Duivis et al., 2008, pp. 83-98).

6.10 CONCLUSION

This section summarises the main findings for each of the contract models discussed above and ends with a comparison of the models against the list of parameters determined in Chapter 5.

6.10.1 UAC-IC2005

The UAC-IC 2005 is a Dutch contract model for integrated projects (e.g. D&C, DBM). Since it only discusses formal, transactional aspects it cannot be considered a relationship contracting arrangement. However, it is discussed here as a point of reference.

The main principle is that the client plays a small role in the project itself. It allows for a differing degree of client involvement through the level of detail of the client specifications, and verification and acceptance procedures. However, active client involvement is discouraged in general, since the contractor is expected to perform design and construction of a project. The model does allow for incentives to be added.

6.10.2 Project Partnering: PPC2000, Samverkan, JCT-CE, and NEC3 ECC

In general the project partnering approach contains a few models which contractually embed the partnering philosophy into an independent contract model. These contract models are JCT-CE, PPC2000, and NEC3 ECC + X12. Another option is to have a partnering approach in addition to a construction contract. An example of the latter is the Swedish Samverkan approach.
The English JCT-CE, PPC2000 and NEC3 ECC + X12 (partnering option) are quite similar contract models and they all aim for increased collaboration between contracting parties. All appoint a special joint management team consisting of the project partners to monitor the project, discuss issues collaboratively and take decisions by consensus. Each allows for the addition of performance incentives or shared savings. In addition they all contain dispute resolution schemes with the option of a mediator or adjudicator.

PPC2000 is more aimed at building construction and therefore emphasises early contractor involvement and being a multi-party contract which includes all relevant parties under a single contract.

The JCT-CE contract has a central ‘overriding principle’ which emphasises collaboration. It includes a management team in an advisory role. In addition, it suggests parties to establish a non-binding partnering charter. The contract can be extended to become a multi-party agreement through the use of a Project Team Agreement. This option also allows the inclusion of a risk and reward sharing provision and a target contract. The PTA formalises the relations between the various parties and extends the role of the management team. There is a liability waiver concerning contributing or not contributing comments regarding each other’s work, similar to the Design Team.

Similar to the overriding principle in JCT-CE the NEC3 ECC contract emphasises collaboration in the first clause of the contract. “The Employer, the Contractor, the Project Manager and the Supervisor shall act as stated in this contract and in a spirit of mutual trust and co-operation.” It furthermore addresses a number of good project management practices: early warning, good communication, and risk management. It also prescribes methods or tools to be used, such as a risk register, and obliging parties to organise risk reduction meetings, and use specific communication tools. Therefore it is more embedded in daily project management practice.

Depending on the choice of main and secondary options, NEC3 ECC can be considered a project partnering or a project alliance contract. NEC3 ECC offers six main options (A-F) which define the role of client and contractor. They offer varying design responsibility of the contractor (from no to full design), and different risk profiles through various remuneration schemes. Option C and D are target contracts which include sharing of pain and gain, and also include additional obligations regarding transparency.
By using the secondary X12 partnering option, a joint management team (Core Group). It also includes an option for the addition of KPI's and targets plus accompanying incentives.

The Samverkan approach on the other hand is not an independent contract model. Instead it offers a structured partnering approach which should be used in addition to a standard contract. For the Swedish infrastructure management organisation Trafikverket the approach is obligatory without being contractually embedded. It offers a different perspective for the implementation of non-contractual project partnering by describing the implementation of six partnering elements: (1) establishing a joint project management organisation which also manages the relation, (2) joint goal setting, (3) performing joint risk management, (4) establishing conflict resolution methods, (5) continuously monitoring project performance, and (6) keeping transparency concerning common matters. These elements are very similar to those embedded in the partnering contracts.

6.10.3 Project alliance: Pure, Dutch & mini-alliance

The project alliance contracts also contractually embed the partnering philosophy, but go one step further by tying the project participant's profit and loss to the outcome of the project via sharing of pain and gain. A project alliance is a comprehensive contract model of which the elements operate in an integrated manner (Department of Treasury and Finance Victoria, 2010, p. 10). It fosters equality between parties, since there is no hierarchical client-contractor relation (Chao-Duivis et al., 2007, p. 45). Parties are considered to be equal and have an equal say in decision making.

The sharing of pain and gain can be done for the entire project, or for part of the project. This is also a prime difference between different project alliances. The Australian project alliances include the design and construction in one contract, whereas in the Dutch project design alliances only the design is made by an alliance of client and contractor. For the construction phase the alliance acts as a delegated client. A separate construction contract is closed with that same contractor which acts as an 'executing contractor' (Dutch: uitvoerend aannemer). Thus the responsibilities of the alliance are smaller and both client and contractor each still have their own responsibilities and risks as well.

Consequently the compensation model is also different. The Australian model uses a method of jointly developing a target outturn cost (TOC) during procurement and reimbursing the contractor for costs that have been made during construction. Any deficits or surpluses compared to the original TOC are shared. In the design alliance an alliance fund is established which covers the alliance organisation and any design risks. There is a pre-set fixed price for construction of the project. If the contractor needs to make additional costs due to a design risk, he is paid from the alliance fund. Lower costs as a consequence of optimisations in the design are added to the alliance fund. Any deficits or surpluses of the alliance fund are split between client and contractor.
The Australian pure project alliance also pays more attention to principles of a no-blame culture and good faith and integrity. Openness is also more important for a reimbursement model.

The mini-alliance is an alternative for smaller projects which could benefit from having some shared responsibility for specific risk(s) that are not easily divided between parties. Sharing of pain and gain is established for the consequences of such a risk. Parties jointly manage this risk, but without an alliance organisation and accompanying mechanisms. It is purely an additional clause to an existing contract.

6.10.4 Integrated Project Delivery

Integrated project delivery (IPD) is an American contract model which is quite similar to the pure project alliance. They share the same philosophy, but IPD emphasises early contractor involvement and the inclusion of BIM. IPD is also intended to be initiated at an earlier stage than a project alliance. The small differences can be explained by the different field of application. IPD is used more often for building construction, whereas the alliance model is mostly used for infrastructure construction. Building construction requires early (sub)contractor involvement to address risks of integration issues as early as possible whereas for infrastructure projects risks are more related to the environment. It is not yet as mature as the Australian project alliance (Lahdenperä, 2012). One key difference with project alliances is the lack of (full) sharing in financial risk. IPD only has a gain sharing mechanism, and an optional clause in which the contractor is not payed labour costs when the target costs are exceeded.

6.10.5 Design Team

The Design Team model is a Dutch model which is intended to stimulate early contractor involvement during the design phase in order to achieve a better design before being put to tender. The model is mostly used for building construction. The Design Team model itself is a multi-party coordination agreement involving client, architect, contractor, and any other relevant subcontractors or advisors. It covers the development of a preliminary design into final specifications. The model focuses on creating an atmosphere in which parties feels free to voice their opinion and contribute ideas. It does so through the agreeing that the liability of a particular idea rests with the party whose expertise it was, or with the party who adopted the idea if it was not his own. Furthermore, all team members (apart from the client) are considered equal. There is however still a hierarchical relation between the client and the other team members. The contract model only covers the design phase. A separate contract is closed with the contractor for the construction phase, which is not necessarily the one who had an advisory role in the design team.

Due to the hierarchical relation between client and (sub)contractors/advisors, and no specific attention for relational aspects, the model is not considered here as a relationship contracting arrangement.

6.10.6 Comparison

In Table 17 the contract models are compared to one another on whether they address the parameters established in Chapter 5. This has been done by careful reading of the contract models, complemented by relevant literature, see Appendix B. Scores are allocated on the following basis:

- Contract addresses aspect ✓
- Contract partly addresses +/-
- Contract does not address ✘

The comparison is purely intended to compare whether the models address certain contract clauses. The exact implementation of each of the contract clauses and whether one implementation is better than the other has not been assessed in this thesis.

Table 17a: comparison of forms. Samverkan is excluded here since it is an approach, not a contract model.

		UAC-IC	Mini-alliance (D&C + pain/gain sharing)	Design Team	NEC3 ECC	PPC2000	JCT-CE
Context & Goals	Description of the parties involved	×	×	×	×	×	×
	Explication of interest of project and parties	×	×	×	×	×	×
	Description of goals of project, agreement, and parties	+/- (minimal)	+/- (minimal)	+/- (minimal)	+/- (minimal)	+/- (minimal)	+/- (minimal)
	Putting goals of the project first	×	×	×	×	×	×
Interaction	Inclusion of norms and values	×	×	×	+/- (option)	+/-	✓ (option)
	Mutual liability waiver	×	×	+/-	×	×	×
	Mutual early warning	×	×	×	✓	✓	+/-
Organisation structure	Joint management team	×	+/-	✓	✓ (option)	✓	✓ (option)
	Duties and obligations	✓	✓	✓	✓	✓	✓
	Unanimous decision making	×	+/- (limited)	×	✓ (option)	✓	+/- (option)
	Pre-agreed conflict resolution methods	✓	✓	+/-	✓	✓	✓
Remuneration	Payment	✓	✓	✓	✓	✓	✓
	Incentive structure	+/- (option)	+/- (option)	×	✓ (option)	✓ (option)	✓ (option)
	Sharing of pain and gain	×	✓ (limited)	×	✓ (option)	✓ (option)	✓ (option)
Monitoring & Control	Performance measurement, KPIs	×	✓	×	✓	✓	✓
	Transparency / openness	×	×	×	✓ (option)	✓ (option)	✓ (option)
Flexibility	Change procedures	✓	✓	✓	✓	✓	✓
	Exit agreement	✓	✓	✓	✓	✓	✓

Table 17b: comparison of forms (continued)

		Project Design Alliance (A2 Hooggelegen)	IPD (AIA-C191 2009)	Australian Project alliance
Context & Goals	Description of the parties involved	✗	✗	✗
	Explication of interest of project and parties	✗	✗	✗
	Description of goals of project, agreement, and parties	+/-	+/-	+/-
	Putting goals of the project first	✓	+/-	✓
Interaction	Inclusion of norms and values	+/-	✓	✓
	Mutual liability waiver	✗	✓	✓
	Mutual early warning	✗	✓	✗
Organisation structure	Joint management team	✓	✓	✓
	Duties and obligations	✓	✓	✓
	Unanimous decision making	✓	✓	✓
	Pre-agreed conflict resolution methods	✓	✓	✓
Remuneration	Payment	✓	✓	✓
	Incentive structure	✓	✓ (option)	✓ (option)
	Sharing of pain and gain	✓	+/-	✓
Monitoring & Control	Performance measurement, KPIs	✓	✓	✓
	Transparency / openness	✓	✓	✓
Flexibility	Change procedures	✓	✓	✓
	Exit agreement	✓	✓	✓

What becomes apparent from Table 17 above is that there are a number of differences between the various approaches. Some elements are common to all contracts and are simply a necessary element of construction contracts in general (duties and obligations, payment scheme, conflict resolution methods, change procedures, and exit agreement). However, there are a few noticeable differences:

- None of the contract models are very explicit in their description of the parties involved, their interests and goals or pay particular attention to the interests of the project and parties.
- Inclusion of norms and values is limited for the Dutch contract models, but it is part of the common law partnering and alliancing contracts. Whereas the partnering and alliancing contracts include a general obligation to cooperate, the Australian project alliance and IPD contracts also call for drafting of an alliance charter.
- Mutual liability waivers are only part of the Australian project alliance and IPD contract.
- A joint management organisation and joint decision making is only present in contract models that have a pain/gain sharing scheme. The same applies to financial transparency (open book) which is primarily related to a payment mechanism that involves reimbursement of costs made by the contractor. This can thus be considered a necessary condition for having a mechanism for sharing of pain and gain.
- Mutual early warning is a key aspect of NEC3, PPC2000 and IPD, but is not present in other contracts.
- Incentives are present as an option in all models but the design team agreement. In addition, the UAC-IC is restrictive in only allowing a bonus for early completion, and sanctions.
- Sharing of gain and pain is possible as an option under the partnering contracts (PPC2000, NEC3, JCT-CE), or as a standard for the alliance contracts. For the latter group the scope of sharing of pain and gain varies. IPD only offers gain sharing.

To summarise, the Dutch UAC-IC 2005 and Design Team agreement address the general contract clauses, but not much else. The project alliancing contracts (project design alliance, IPD, Australian project alliance) offer a complete range addressing most of the parameters. There are some variations between them relating to mutual early warning, the scope for sharing of pain and gain, and the lack of pain sharing in IPD. The partnering contracts (NEC3, PPC2000, and JCT-CE) offer various options through which they can be used as a simple contract or elaborate partnering or even alliancing contract. Even as a simple contract, these models still contain a general collaborative principle, and mutual early warning, and PPC2000 also already includes a join management team.

7. CASE STUDIES

This chapter will investigate through the use of case studies and interviews which of the contract clauses the practitioners find of (particular) importance for fostering types of best-for-project behaviour. It will therefore answer sub question 5: *How do practitioners regard the influence of the contract on best-for-project behaviour?*

Four cases are discussed subsequently, UAC-IC 2005 Sluiskiltunnel, project alliance Alliantie Amstelspoor, NEC3 International Criminal Court, and project alliance A2 Hooggelegen.

7.1 UAC-IC 2005: SLUISKILTUNNEL

Project Name	Sluiskiltunnel
Location	Sluiskil, The Netherlands
Client	BV KanaalKruising Sluiskil (BV KKS), on behalf of the province of Zeeland
Contractor	Combinatie BAM-TBI
Contract model	UAC-IC
Project delivery system	DBM
Contract sum	€ 208 million
Contract period	October 2011 – May 2015
Project scope	2 tunnel tubes of 1150m long, 6 kilometre of road, intersections, cycling bridge, railroad crossings.

7.1.1 The project in general

The Sluiskiltunnel forms a new infrastructure connection (N62) to cross the Gent-Terneuzen channel in the province of Zeeland as an alternative for the existing bridge (N61) which used to be open 23 times a day for a total of 5 hours every day. This was estimated to have an economic cost of 10 million euro each year. As a solution, a drilled tunnel was opted for.
Apart from the tunnel itself, the project included the construction of 6 kilometres of road, two split-level junctions, a bridge for cyclists, and three railroad crossings. The contract sum was close to € 208 million. The tunnel itself consists of 2 tubes of 1.150 meters, with a diameter of 11 meter (BV KanaalKruising Sluiskil (KKS) Terneuzen & BAM Infra Nederland bv, 2015).

The tunnel was completed 5.5 weeks in advance, within budget, without claims or residual issues, and with excellent scores for quality and safety. This was caused by the excellent cooperation between client and contractor (CBT, a coalition of BAM and TBI), within the contractor coalition itself, with the manager, emergency services, and other stakeholders (BV KanaalKruising Sluiskil (KKS) Terneuzen & BAM Infra Nederland bv, 2015).

An important optimisation was the use of a fire-resistant polypropylene fibre in the tunnel elements instead of applying a separate layer of fire resistant material after construction of the tunnel itself, an innovation which had not yet been used before. In addition, early involvement of emergency services during tender and design stages ensured their demands were met from the start (BV KanaalKruising Sluiskil (KKS) Terneuzen & BAM Infra Nederland bv, 2015).

In an evaluation report Hertogh, Bakker, De Man, and Scholten (2015) identified the following important success factors:

- The project organisation of the Sluiskiltunnel (BV KKS), which served as the client for this project on behalf of the Province of Zeeland, was made a separate entity in the form of a private company (B.V.). This placed the project organisation at a distance from the provincial government. It also allowed the project organisation to hire its own personnel and thus focus on getting people with the right technical expertise.
- An integral approach for the project in which the contractor for the tunnel installations was also part of the contractor consortium.
- Both client and contractor acknowledged and invested in cooperation and openness.
- The project had a high degree of technical complexity, but since it was a new connection in an agricultural site the environmental complexity was low.
- A well balanced combination of control and trust was used in which control supported trust.

7.1.2 Project philosophy

The project had a strong emphasis on quality and safety, which became a shared focus of client and contractor (BV KanaalKruising Sluiskil (KKS) Terneuzen & BAM Infra Nederland bv, 2015). The client organisation also wanted to be involved in the project and recognised that it therefore needed experts who could function as a knowledgeable counterpart for the contractor (PM KKS).

Contractor incentives were available on a number of key result areas. These incentives were only announced after granting the project so the contractor would not count on achievement of these bonuses when determining his bid (and thus a normal situation where the bonus was not granted would become a sanction). These incentives consisted of:

- A bonus for safety of up to € 1 million (Hertogh et al., 2015, p. 47).
- A bonus for quality of up to € 1 million (Hertogh et al., 2015, p. 37).
- A bonus of € 3,65 million for delivery without claims, without any remaining issues, and completion five to six weeks early (Hertogh et al., 2015, p. 22).

7.1.3 Contractual clauses

The contract model for this project was the UAC-IC 2005. According to the interviewees the contract did not play a role in steering behaviour in the project (PD SK; PM SK). However the KPIs (and at a later moment the related incentives) which were part of the contract did provide a focus and worked as a motivator for the contractor (Hertogh et al., 2015).

7.1.4 Behaviour during the project

During the project there was close interaction between client (KKS) and contractor (CBT). There was an atmosphere of mutual cooperation in which problems were openly discussed and solved in cooperation between the parties.

The type of behaviour referenced most often during the interviews was *supporting* (client supporting the contractor to achieve the challenging goals (and gain a bonus)), *pro-actively informing* (voicing opinion and offering ideas), *having a critical attitude* (reflecting on outcome and processes), and *acting in good faith* (acting in the spirit of agreements; be fair and honest to each other) (PD SK; PM SK). Appendix D shows a more detailed breakdown per type of behaviour.

7.1.5 Collaborative practices

A number of collaborative practices were applied as well. Co-location on a remote site enforced interaction between personnel and there was plenty of attention for relationship building and relationship maintenance. Project start-ups and project follow-ups were arranged, the contractor's project manager and client's project director regularly held informal meetings, so called 'thermometer teams' investigated the status of cooperation on the work floor and any grievances that might persist within the project. Furthermore, once every two or three months the cooperation was discussed in a meeting of the boards of client and contractor, without agenda or making minutes (PD SK; Hertogh et al., 2015, pp. 19-25).

In addition a 'policy statement' was drafted. This was a short text in which the main goals were listed, the desired attitude and how this was to be achieved. This document formed a basis for parties to address each other in case of divergent behaviour (PM SK). Lastly the project director of KKS also played an important role in leading by example. His search for collaboration was also recognised as being important in establishing best-for-project behaviour.

7.1.6 Discussion

Based on the interviews there was a strong influence of the incentives and KPIs in the contract on the collaboration within the project team, but primarily in giving focus to the project team. High quality and safety and an early completion free of disputes were important aspects of the project philosophy, which was expressed through the formulation of the KPIs, and later emphasised through the addition of incentives. This aligned the interests and encouraged the parties to address each other on related issues, and to be reflective on these matters. The resulting behaviour consisted of supporting (monitoring & correcting errors - providing constructive feedback; providing help & requesting help) and having a critical attitude (reflecting on outcome & processes).

During the interviews, both parties emphasised that people are the crucial factor in determining whether the principles and contractual clauses embodied in the contract will be realised. The way people use the contract is crucial (PD SK; PM SK). The client organisation consisted of people with a positive mind-set who wanted to contribute to the success of the project, had sufficient expertise to be able to understand the contractor and thus were willing and capable to think along (PM SK).
The project director of the client stated that at some point during the project the contractor had said the client could use the contract to his advantage and to the detriment of the contractor. However, the client chose not to do so and to look for win-win for both parties, thus gaining the trust of the contractor (PD SK).

A very important aspect in the determination of the behaviour appeared to be the attitude of principally the client's project director and the contractor's project manager. They had similar attitudes towards the project, although it took some time before the project manager of the contractor trusted the project director of the client would persistently act in the way he had stated from the start. A key phrase in this respect is 'exemplary behaviour'. In line with what was mentioned in chapter 3 on behavioural change, the project director emphasised the importance of continuously showing the desired behaviour himself and actively addressing situations in which this was not the case. Reciprocity is also a relevant term here: by showing trust himself and actively working on developing and maintaining this trust, he also gained the trust of the contractor.

7.2 PROJECT ALLIANCE: ALLIANTIE AMSTELSPOOR

Project Name	Alliantie Amstelspoor
Location	Amsterdam, The Netherlands
Client	ProRail
Contractor	BAM Combinatie Amstelspoor (BAM Civiel, BAM Rail, BAM Wegen, BAM Infratechniek and BAM Infraconsult)
Contract model	-
Project delivery system	Project Alliance
Contract sum	€ 170 million for construction & alliance fund € 45 million
Contract period	2010 - 2016
Project scope	Increasing the number of tracks from 2 to 4 between the train stations of Amsterdam Zuid and Amsterdam Duivendrecht. Design, site preparation, rail infrastructure (rail, energy supply and overhead wiring, rail safety systems), civil structures.

7.2.1 The project in general

Amstelspoor is part of the OV SAAL program. This program includes the implementation of high frequency rail (Dutch: hoogfrequent spoor), increasing the capacity of the railroad. As a consequence the number of tracks between Schiphol (airport), Amsterdam, Almere, and Lelystad will have to be increased from 2 to 4. Meanwhile the existing tracks and adjacent highway will remain in operation. Secondly, the existing rail infrastructure will be adapted to allow more trains to make use of these tracks. And finally, the project is also a preparation of the Zuidasdok megaproject (Caan & Ingels, 2014; Fugro, 2014) which is currently being tendered and will be awarded in early 2017 (Zuidas, 2016).

Part of this track consists of 8 kilometre of railroad between Schiphol and Duivendrecht and runs through a heavily used area with an existing railroad, highway, metro system and business parks and offices, including the Zuidas. This part of OV SAAL, called 'the Zuidtak' between the Riekerpolder and the train station of Duivendecht is split up in two sections to make them more manageable and to be able to learn from two comparable alliances (roughly the same area, construction period, tender and contract). Furthermore, this was the first time ProRail directly tendered a project alliance whereas previously a D&C contract was tendered with an option to close an alliance agreement afterwards (Caan & Ingels, 2014).

The western part between Riekerpolder and train station Amsterdam Zuid is covered by the project alliance 'WALTZ', the eastern part between Amsterdam-Zuid and Duivendrecht is covered by 'Alliantie Amstelspoor'. The Alliantie Amstelspoor organisation consists of ProRail with BAM Combinatie Amstelspoor (Caan & Ingels, 2014; Fugro, 2014). This area has a high degree of technical complexity and environmental complexity, time pressure, limited construction space, a large number of external stakeholders (including Schiphol and multinational companies), and other construction projects in close proximity (Caan & Ingels, 2014).

The scope of Alliantie Amstelspoor includes the design, site preparation, rail infrastructure (rail, energy supply and overhead wiring, rail safety systems), and civil structures. Important aspects in this project are the limitation of nuisance for travellers during construction (Fugro, 2014) and high requirements concerning safety.

At the start of the project a large scope change occurred that significantly influenced the entirety of the project. This meant a full revision of the entire preliminary design that had been tendered. Naturally this was an important disturbance to the project but the parties did manage to resolve their issues (AM AA). This was at least in part attributed to the project being a project design alliance (TDM AA).
Due to this scope change the project faced a completion date somewhere in 2018, whereas the target was end of 2016. With joint efforts a number of optimisations were found of which temporarily taking the existing tracks out of service for 9 days is the most significant. Due to this unconventional solution the project team managed to get the planning back on track (AM AA).

7.2.2 Project philosophy

ProRail was looking for increased collaboration and achieving optimisations in this project which they thought was more likely to occur with a project alliance (TDM AA). The philosophy for this project thus follows the alliance principles as described in Chapter 6.6: the joining of forces with close collaboration and good coordination between parties by implementation of sharing of pain and gain, unanimous decision making, equality of project partners, and full openness.

7.2.3 Contractual clauses

The contract itself does not specifically address behaviour within the project team (TDM AA). The contract does contain a clause with the project goals and leading principles which reads as follows (AM AA, translated by author): *"By engaging in an alliance parties agree to work together to realise the project and if necessary optimise, in such a way that the project will be completed on budget, on time, and at least in compliance with quality and safety requirements, without disputes, and with the least possible nuisance for the environment. Therefore parties will in collaboration contribute to managing the risks which are part of the alliance scope."* Although these goals and principles are not very remarkable, they are usually not written down in the contract (AM AA).

The interviewees for this project identified the mechanism of sharing in pain and gain as the prime motivator to influence behaviour but primarily aimed at finding optimisations. Whereas under a D&C contract there is limited interest to work on optimisations that do not financially benefit the own party, the savings of the optimisations are shared in the project alliance. In addition, the contract contained an express invitation to challenge ProRail's requirements, a situation unique to construction projects. This also led to more extensive searching for optimisations (AM AA; TM AA, TDM AA).

7.2.4 Behaviour during the project

Specific behaviour that was identified in the interviews was: *supporting* (monitoring & correcting errors – providing constructive feedback; co-construction of meaning, providing help & requesting help), *pro-actively informing* (providing necessary information & knowledge, voicing opinion & offering ideas), and *having a critical attitude* (reflecting on outcome & processes, search and propose improvements / optimisations; challenging each other's ideas and assumptions) (AM AA; TDM AA; PM AA). Appendix D provides a more extensive list.

On the other hand, 'old' adversarial behaviour was also still observed on multiple occasions (TM AA; AM AA). In addition, for some of the risks that were capped in time opportunistic behaviour was also observed. The contractor would reduce his efforts when approaching the cap (TDM AA).

The large scope changes at the start of OV SAAL put pressure on the alliance model but the parties did manage to resolve their issues although they were unable to do so within the alliance itself (Caan & Ingels, 2014). Nevertheless, the contractor put in serious effort to continue work on the project where possible while he had good reason and sufficient legal grounds to stop work entirely. This was at least in part attributed to the project being a project alliance (TDM AA; TM AA).

7.2.5 Collaborative practices

A number of collaborative practices were undertaken. This included a project start-up, monthly informal get-togethers to update the project team about project progress, co-location in one site office, and meetings every 6 weeks with the alliance board to discuss the course of events (TM AA; AM AA). There were also occasional events, but it proved difficult to involve people in undertaking such informal activities (AM AA).

The alliance manager expressed a desire to continuously seek each other out during the project and to undertake informal activities outside the project office (AM AA). This appears to be primarily an intrinsic motivation.

The project developed an alliance management plan that included a number of aspects related to behaviour (TM AA). These aspects were deliberately omitted from the contract itself (TDM AA).

7.2.6 Discussion

The sharing of pain and gain and the express invitation to be critical towards ProRail's requirements resulted in the behaviour of having a critical attitude. Other than that a direct link between contractual clauses and behaviour was not indicated (AM AA; PM AA).

Alliantie Amstelspoor achieved very good results despite a very large scope change at the start of the project and internal problems related to financial dealings. The outcome in terms of behaviour is unfortunately not entirely what was hoped for. On the positive side the intention to realise a number of optimisations was realised and related behaviour was observed: having a critical attitude and supporting. However opportunistic behaviour was also still observed (AM AA; PM AA).

An important lesson for ProRail is that the right people should be selected to work on the project. They should be capable of internalising the alliance mind-set. There should also be sufficient balance in the number of people from ProRail and those of the contractor. In this project such a balance was lacking. A few people at strategic positions in the project organisation could improve the balance and ensure more control (AM AA).

All three interviewees expressed the importance of the team as the decisive factor in achieving a good project. Having a good contract in place, and having the right incentives in place, is still no guarantee that the intentions will be fulfilled. The project team should also be capable of fulfilling the agreements from that contract (TDM AA; AM AA; PM AA).

7.3 NEC3: INTERNATIONAL CRIMINAL COURT THE HAGUE

Project	International Criminal Court
Location	The Hague, The Netherlands
Client	International Criminal Court (ICC) Permanent Premises
Contractor	Courtys: a combination of Visser & Smit Bouw and Boele & Van Eesteren
Contract model	NEC3 ECC option C: target contract with activity schedule
Project delivery system	E&C
Contract sum	€ 165 million
Project period	Oct 2012 – Nov 2015
Project scope	6 towers, 56.000 m^2, 1200 work places. A 'Court tower' with 3 court rooms, prison cells, offices, conference centre, library on international criminal law, and press rooms. Complicated logistics to ensure witnesses will not come face to face with the accused (Koenen, 2013; Verschuure, 2014). High safety standards including a bomb-proof façade.

Figure 11: The Permanent Premises of the International Criminal Court. Image source: (Architectenweb, 2015).

7.3.1 The project in general

The project involved the construction of the new permanent premises of the International Criminal Court (ICC) in The Hague. The ICC, established in 2002, was formally housed in a number of temporary locations in The Hague. Project and cost management was performed by the Dutch project management firm 'Brink Groep', from 2009. They prepared and conducted the international tender for the selection of the architect. The winning architectural design of Schmidt Hammer Lassen Architects was further developed into a final design in close cooperation with Brink Groep. Afterwards this design was put to tender for the selection of the contractor. The winning consortium, Courtys, then undertook the engineering and construction (E&C) (Van Zuilekom, 2015).

The assessment criteria for procurement of the contractor included 60% quality criteria (project management plan, logistics, planning according to NEC3 principles, and whether they had a connection with the project team) (Koenen, 2013).

A risk fund of 3% of the contract sum was established, intended for optimisations and additional costs. Total shared savings are estimated at about € 7 million at project completion (NEC, n.d.).

7.3.2 Project philosophy

Since the ICC is an international organisation, the construction of the new premises also required an international construction standard (Koenen, 2013). ICC also wanted a standard aimed at cooperation and liked the concept of a target contract (PD ICC). The contract model which was deemed by Brink Groep to be the most suitable for the project, was the NEC3 ECC option C, 'target contract with activity schedule' (see Chapter 6.6 for a short description). Thus this project became the first application of the NEC3 contract in a large Dutch construction project (NEC, n.d.). To support the collaborative intention one of the selection criteria during procurement was the connection between the client and contractor project teams.

7.3.3 Contractual clauses

As stated above the contract for this project consisted of a NEC3 Engineering and Construction Contract option C, target contract. This title already indicates the primary method to steer behaviour of parties which is the remuneration mechanism of the target contract. This ensures both parties benefit from any savings through optimisations and ensures both will suffer in case of cost overruns (PD ICC). The target contract mechanism is supported by open book accounting, meaning the contractor sends a copy of his administration to the client every month. Apart from the target price mechanism the contract did not contain any specific incentives (PD ICC).

Secondly, the first contract clause (10.1) "*in a spirit of mutual trust and co-operation"* was also claimed to have influenced behaviour and emphasises the desire of the client organisation to cooperate (PD ICC).

Thirdly, NEC3's clauses on early warnings and risk meetings also helped to communicate potential problems as early as possible and jointly address them through regular risk meetings (PD ICC).

7.3.4 Behaviour during the project

A number of characteristics of the NEC3 contract aided the successful completion of the project.

The target price, joint procurement and open books policy stimulated adoption of a critical attitude and to keep an active discussion within the project team. As a part of the target price mechanism, deviations from the target price are shared according to a pre-established ratio (Koenen, 2014). Therefore the contractor was incentivised by the NEC3 to look for optimisations and seek active participation of the supply chain (Koenen, 2013).
The target contract acted as a strong incentive for the client to help the contractor keep costs down and realise optimisations. This inclination is much more present than under a fixed price contract. This resulted in pro-active behaviour to keep costs down, as well as jointly looking for and developing optimisations (PD ICC).

The early warning mechanism in the NEC3 contract was claimed as an important tool in helping the parties to avoid mistakes and to collaborate on issues that normally would have led to discussions, delays and additional costs. Approaching completion of the project, 160 early warnings had been issued. 50 by the client, and 110 by the contractor (Koenen, 2015; NEC, n.d.).

Other behaviour that was mentioned during the interview included *supporting* (co-construction of meaning; providing help & requesting help), *pro-actively informing* (informing other party of any issues that may impede realisation of project goals; providing necessary information & knowledge;

voicing opinion & offering ideas), *providing openness* (being open about intentions & interests; providing full openness on areas necessary for realisation of project goals), *having a critical attitude* (reflecting on outcome & processes; search for and propose improvements / optimisations), and *quickly resolving problems* (PD ICC). See Appendix D for a more extensive overview of behaviour mentioned during the interview.

7.3.5 Collaborative practices

There appears to have been limited attention for collaborative practices in the project. A few milestone celebrations were held such as driving the first pile into the ground and reaching the highest elevation of the building.

Special attention was also paid at the start of the project to explain the most important design aspects and key issues to the contractor and to make sure he would not waste effort on things that were not open to discussion.

7.3.6 Discussion

Sharing in the financial result of the project resulted in behaviour of supporting each other to find solutions to problems or optimisations, pro-actively informing in case of potential problems, providing openness, and having a critical attitude. Also in areas outside of one's responsibility (PD ICC).

The mutual early warning clause resulted in pro-actively informing each other in case of potential problems, and supporting each other in finding a solution, having a critical attitude in checking for potential problems, and quickly addressing those issues (PD ICC).

The importance of having the right people was indicated as being more important than the contract itself. The success of a project is determined by the quality and capability of the people working on it. If these people are incapable or unwilling to act as intended by the contract the project will still be problematic. This is primarily part of the character of a person and the company culture. The contract will not change a person’s character, i.e. a desire to collaborate, achieve good results, be open and transparent, but it will influence what topics will be discussed during the project. That is, if his organisation stands to gain by investing more effort in the project he will be much more likely to do so. Selection of the project team was therefore also a MEAT criterion in the tender (PD ICC).

Hence the target price mechanism also seems to be the most influential element of the contract. The early warning mechanisms also functioned as an important tool (PD ICC).

NEC3 stimulates resolving issues as soon as possible. This is done by identifying risks early on, discussing them in risk meetings, and by clearly keeping track of the decisions that are made. The same approach is adopted for handling the financial consequences of changes, and by having an adjudicator as an accessible external mediator (PD ICC).

7.4 PROJECT ALLIANCE: A2 HOOGGELEGEN

Project	A2 Hooggelegen
Location	Utrecht
Client	Rijkswaterstaat, municipality of Utrecht
Contractor	Trajectum Novum (Van Hattem & Blankevoort, KWS Infra, Mourik Groot-Ammers, Boskalis, Vialis)
Contract model	-
Project delivery system	Project Alliance
Contract sum	€ 125 million
Contract period	2008-2012
Project scope	Expansion and reconstruction of 1.7 km of the A2 highway between interchange Oudenrijn and the newly build Leidsche Rijn land tunnel. Construction of a new road to connect the new city district Leidsche Rijn, refurbishing an existing bridge, and constructing a new flyover to connect two business parks.

7.4.1 The project in general

The only project alliance project completed by Rijkswaterstaat thus far is called A2 Hooggelegen and was completed in 2012. The project covered a relatively short section of the A2 highway near Utrecht as part of a larger project to extend the A2 highway from 2x3 lanes to 2x5 lanes. The section of A2 Hooggelegen covered a highly complex section of the highway due to the limited available space and since construction had to be done while the existing road remained in operation. Furthermore, time pressure was very high. Therefore at the start of the project in late 2007, the goal of completion in 2010 appeared unattainable (EM A2H), since the project was estimated to take 4 to 5 years.

The project team started in November 2007 and completed most of the work in July 2010 (2 years and 10 months), with some remaining points to be finished at a later moment. The original budget was exceeded by 7%, which was still within bounds. All KPIs were achieved.

7.4.2 Project philosophy

Since the project was time-sensitive the procurement procedure was also performed quickly. Rijkswaterstaat acknowledged that it was not possible to fully work out all the details and therefore a number of elements were still to be further developed during the project (Rijkswaterstaat, 2010). Therefore the human aspects were more important, i.e. finding the right people, and a team assessment became an important part of the procurement procedure (Van der Geest & Bloemendaal, 2011, pp. 47, 52-53).

Another key aspect in the project was the alignment of interests. This was achieved through sharing of pain and gain and implementing KPIs with associated bonuses and maluses for the project.

7.4.3 Contractual clauses

The alliance adopted 6 alliance principles in the contract (Van der Geest & Bloemendaal, 2011, pp. 44, 77), which are similar principles to those of project alliances in general:

1. All decisions and actions in the alliance should be based on the principle of ‘best-for-project’.
2. All decisions in the alliance must be taken on the basis of consensus.
3. Parties will exercise full openness towards each other.
4. Prevent and avoid disputes: disputes must be avoided wherever possible and, if unavoidable, must be resolved as quickly and efficiently as possible within the alliance.

5. ‘Profit for one, loss for another’ is not an acceptable outcome and partners will share the pain of underachievement.
6. Achieving excellent performance on all key performance indicators (KPIs).

How these principles were to be implemented during the project still needed to be elaborated in a project management plan which the parties were contractually obliged to compose during the first 8 weeks of the project.

Typical to the Dutch project design alliances, the project also had a separation between the design and construction phase. The level to which the alliance was supposed to make the design was not specified. As it turned out Rijkswaterstaat and the contractor had a different idea about the degree of design activities to be performed by the alliance. Rijkswaterstaat intended these activities to be limited whereas the contractor intended it to be the complete design. This did not become apparent until well into the project (EM A2H). The project also incorporated an alliance fund, the result of which was to be split after completion of the project.

The contract also lists the KPIs for the project. These involve traffic nuisance, safety, budget, availability (time), quality, and image/reputation. An incentive system of bonuses and maluses was connected to these KPIs. The result was to be added or subtracted from the alliance fund (Melger, 2013; Van Leeuwen, Van der Veen, Huijzer, & Maliepaard, 2011). The bonuses were substantial and maximised at a total of € 15 million to be divided between Rijkswaterstaat and Trajectum Novum (EM A2H; Rijkswaterstaat, 2010).

The contract also contains a clause indicating that Rijkswaterstaat will provide office space to the alliance, to be paid from the alliance fund.

7.4.4 Behaviour during the project

Particular attention was paid to the establishment of the alliance as one organisation with a single, shared identity. This was emphasised throughout the project. No distinction was made between the origins of an employee of the project team (EM A2H). Furthermore, an organisational culture was created in which people’s contributions were respected: an atmosphere of psychological safety (Van der Geest & Bloemendaal, 2011, p. 69; EM A2H).

The alliance principles played an important role during the project since they were linked to the KPIs and bonuses. During the first weeks of the project the alliance principles were translated into the project management plan. The AMT took these principles to heart. When decisions had to be taken, the options were evaluated against the alliance principles in the contract, and solutions were sought which respected everyone’s interests in order to achieve the win-win solutions (EM A2H).

Behaviour mentioned during the interview included *supporting* (monitoring & correcting errors - providing constructive feedback; co-construction of meaning; providing help & requesting help), *providing openness* (being open about intentions & interests, providing full openness on areas necessary for realisation of project goals), *having a critical attitude* (reflecting on outcome & processes; search for and propose improvements / optimisations; analysing errors; challenging each other's ideas and assumptions), and *respect and value each other* (respect each other's interests; recognising the interests and achievements of others; treating each other with respect; treat each other as equals). Appendix D provides a more extensive breakdown of the behaviour mentioned.

7.4.5 Collaborative practices

After the first two weeks of the project, a project start-up was held in which parties discussed the translation of alliance principles to project practice (EM A2H). Furthermore, a number of project follow-ups were held (EM A2H).

Co-location was also mentioned as an important aspect for the project. At first it was implemented by having two separate floors within the same office building but physically separated through the use of access cards and separate IT systems. The AMT however decided this was not in line with alliance principles and instead divided the 4 project clusters over the 2 floors. Within the clusters employees from client and contractor were mixed (EM A2H).

Team building events were held, also within clusters and specific attention was paid to personal development of the team members (EM A2H; Rijkswaterstaat, 2010). Finally a 'performability scan' was organised in which the cooperation was measured (Rijkswaterstaat, 2010).

7.4.6 Discussion

The contract established a number of conditions which stimulated collaboration during the project. The contract provided the alliance team with clear principles, but the translation of those principles into concrete actions and consistent application during the project was performed by the alliance management team itself. These principles resulted in behaviour of supporting, providing openness, having a critical attitude, and respect and value each other. The second principle, consensus decision making, also forced the parties to be critical towards each other during discussions within the management team (EM A2H).

Selecting a suitable contractor was important and thus team assessments were part of the procurement process (EM A2H; Rijkswaterstaat, 2010). The people that ended up working on the project had a strong desire to achieve the challenging goals (EM A2H).

The very challenging goals represented by the KPIs and supported by the incentives offered a direct focus for the project team and stimulated collaboration since both parties needed each other to achieve them. This aligned the goals of the parties. For Trajectum Novum achieving the bonus was especially important since they had already counted on achievement in their offer during procurement (EM A2H; Van der Geest & Bloemendaal, 2011, pp. 114-115).

Co-location facilitated direct interaction and with a PSU, team building events, PFUs, and the performability scan the relation between the parties was developed and maintained. The AMT also fostered the development of a strong uniform identity.

In comparison to the other projects, less attention was adhered to achieving specific optimisations and more to the soft factors and achieving alignment of interests through a collaborative approach. Furthermore the incentive arrangement connected to the KPIs was mentioned more prominently than sharing of pain and gain during the interview and in the evaluation book (Van der Geest & Bloemendaal, 2011).

Overall, there was a clear alignment of and interaction between project philosophy, contract, project team selection, and collaborative practices.

7.5 EXPERT REFLECTION INTERVIEWS

The interviews in the second round were used for enrichment and to verify findings thus far.

The role of the contract for behaviour

- People act in three ways: routinely, purposefully, and impulsive/improvising. The contract can only address routine and purposeful behaviour, not impulsive. Impulsive is important in dealing with unexpected issues but these cannot be planned, and thus cannot be covered by the contract (EB).
- Interdependence forces people to collaborate. However the contract is intended primarily to allocate responsibilities rather than share them. Therefore it is important to create some shared responsibility (EB).
- Adding specific clauses obliging e.g. the formulation of conflict resolution methods will mean that parties will fill those out, even when it is of no added value (CE; EB).
- Make sure the right incentives are put in the contract. Incentives are a good method to align interests, but these incentives should be implemented properly. They should only apply to areas of particular relevance to the project and should not reward business-as-usual (CE).

The usage of contracts in general

- The project and project goals should be in service to the project, not the other way around. The same goes for the procurement method (CE).
- Alignment between project philosophy, procurement and contract often goes wrong. Project goals and project philosophy are often not communicated clearly (or even left out entirely in favour of SMART functional specifications) (CE).
- Proper application of contracts would solve a lot of problems. If parties start poorly, repair work is necessary, which a good team or a good leader can provide. But that would not be necessary if the contract is clear, and has the right incentives for aspects that are of importance to the project. And the attitude of the parties during procurement also sets the bar for the rest of the project (CE).

The UAC-IC 2005

- The client is often focused on the procurement process and drafting the contract. After awarding the contract the tendency is to only act as an external observer, focusing only on what goes wrong (CE). This does not help relations.
- UAC-IC is primarily a legal document with a legal explanation. It only arranges a number of formal aspects. However it does not give guidance to the intended method of collaboration, this has to be arranged separately, and matched with the contract (CE).
- It is all about using the contract model in the right way. There is a lot of criticism on the UAC-IC, but most of it is related to poor application. This is caused by having insufficient knowledge about the model, and what it does and does not do. People think that the model does not allow client involvement, since involvement would mean taking on responsibility (CE).

Dealing with risks and scope changes

At the beginning of the project some potential problems are created:

- Mutual expectations concerning the project and behaviour of the other party are formed during the procurement phase. These often lead to disappointment afterwards if not discussed at the start of the project (EB).
- The scope at the start of the project, and thus the scope defined in the contract, is not the scope that will be realised in the end. The scope will change based on new insights (EB).

Therefore, it would be good to add a clause concerning reassessment of the scope and the risks at a certain point in time, e.g. at the end of the design phase. Preferably there is also a risk fund available which parties can use to jointly manage newly discovered risks.

7.6 CONCLUSIONS FROM THE CASES

What do the results of the cases and interviews mean for the research conducted in this thesis? The results of the cases will be combined here, focusing on the relation between specific contract clauses and (aspects of) best-for-project behaviour which the practitioners observed in the cases.

7.6.1 The influence of the contract for behaviour

The interviewees consider the contract as a necessary condition. It establishes some ground rules and clarifies expectations and obligations of the parties. However, the influence of the contract on behaviour is believed to be limited.

However, Table 18 presents an overview of the relation between specific contract clauses and specific aspects of best-for-project behaviour that were found. The quotes from the interviews on which these relations are based can be found in Appendix E[5]. These relations indicate there is definitely a relation between the contract and behaviour.

Table 18: Behaviour mentioned in relation to specific contract clauses during the interviews. Grey cells indicate a contract clause was not present. Hence there cannot have been a relation between that contract clause and specific behaviour.

	Sluiskiltunnel	International Criminal Court	Alliantie Amstelspoor	A2 Hooggelegen
Sharing of pain and gain		2. Supporting 3. Pro-actively informing 5. Providing openness 6. Having a critical attitude	6. Having a critical attitude	
Incentive structure, KPIs	2. Supporting 6. Having a critical attitude			
Inclusion of norms & values				2. Supporting 5. Providing openness 6. Having a critical attitude 8. Respect and value each other

[5] Omitted in the public version of this report.

Mutual early warning		2. Supporting 3. Pro-actively informing 6. Having a critical attitude 9. Quickly resolve		
Unanimous decision making				6. Having a critical attitude

Sharing of pain and gain

First of all, sharing of pain and gain (in the form of an alliance fund or target price contract) was found to be primarily useful for achieving optimisations in projects (*having a critical attitude* (search for and propose improvements / optimisations; reflecting on outcome & processes)) (PD ICC; AM AA). It encourages both parties to jointly work in achieving those optimisations since both parties financially benefit from them. This also leads to *pro-actively informing* (informing other party of any issues that may impede realisation of project goals; voicing opinion & offering ideas) and *supporting* (providing help & requesting help) in order to achieve lower costs. This relation is illustrated in Figure 12. All interviewees indicate that they have either experienced or see the benefit from implementing this clause in stimulating project teams to work more closely in achieving optimisations.

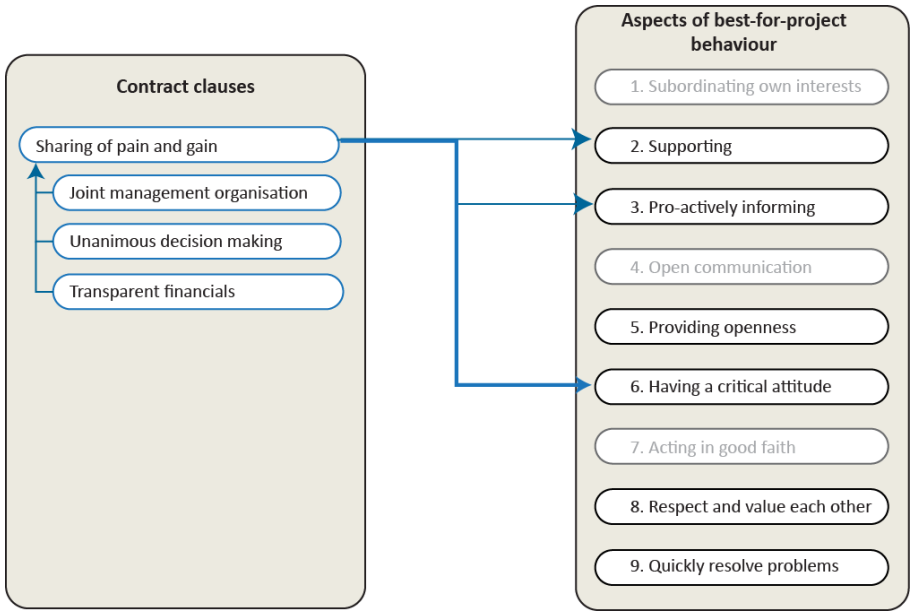


Figure 12: Behaviour associated with the contract clause sharing of pain and gain.

Incentive structure

Secondly incentives were found to be relevant. It primarily functions by indicating the key result areas which are important to the client, thus giving focus in the project. Whether the incentives are achieved is measured through identifying KPIs. This results in the behaviour of addressing each other on issues related to those KPIs (having a critical attitude (reflecting on outcome & processes), and supporting (monitoring & correcting errors - providing constructive feedback; providing help & requesting help) (PD SK; PM SK). This is illustrated in Figure 13.

But incentives can also have an adverse effect. When a contractor in his bid already counts on being awarded a bonus, not reaching it will become a penalty. A neutral result (which is still acceptable to the client) counts as a malus for the contractor and tensions may increase when the project runs into problems. Thus specific incentives are best announced after awarding a contract (PD SK; PM SK).

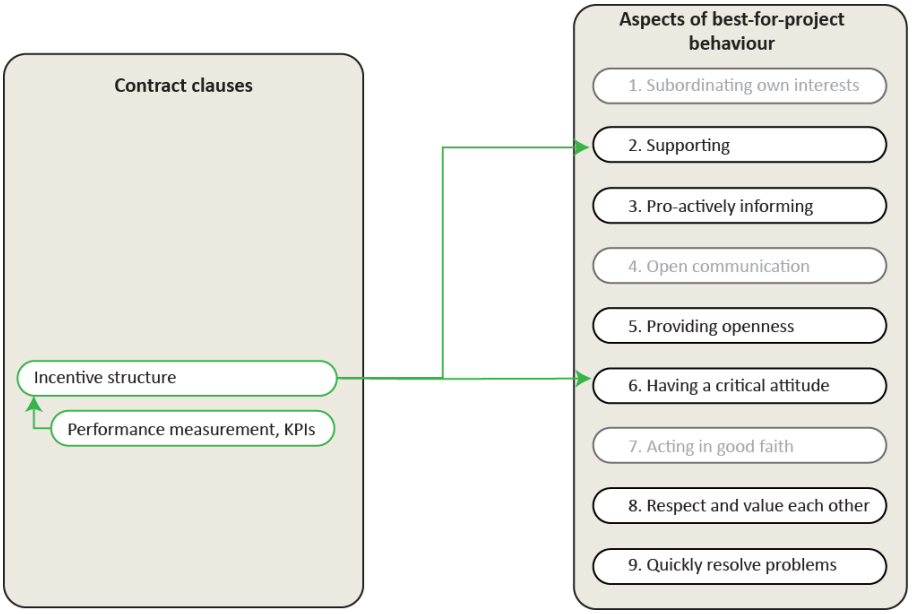


Figure 13: Behaviour associated with the contract clause incentive structure.

Inclusion of norms and values

Thirdly inclusion of norms and values was found to lead to *supporting* (co-construction of meaning), *providing openness* (providing full openness on areas necessary for realisation of project goals), *having a critical attitude* (reflecting on outcome & processes; search for and propose improvements / optimisations) and *respect and value each other* (respect each other's interests). See Figure 14.

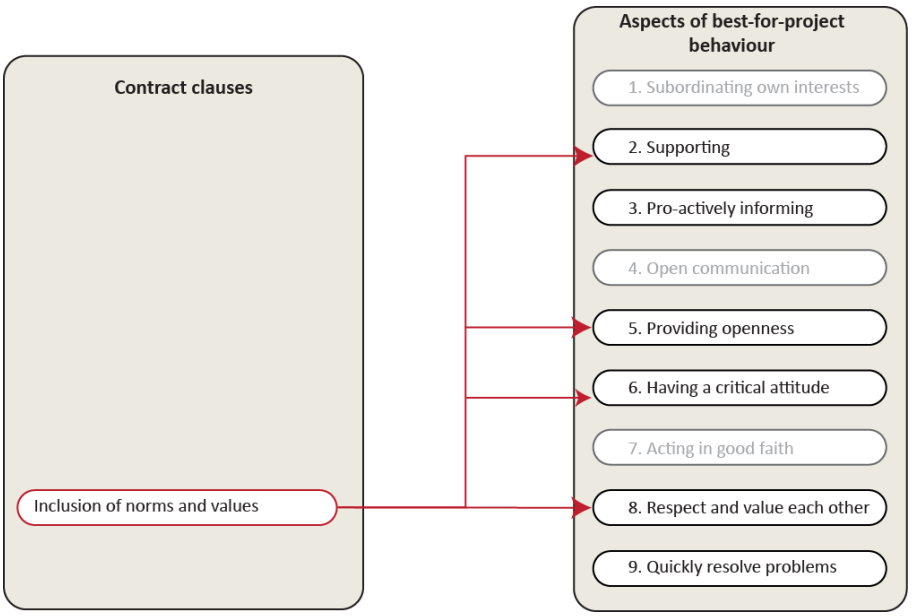


Figure 14: Behaviour associated with the contract clause inclusion of norms and values.

Interestingly, while the alliance principles were found to have an important role in A2 Hooggelegen (EM A2H), this was not the case in Alliantie Amstelspoor. A possible explanation is that there was not enough time and attention allocated to the development of these principles (AM AA).

Mutual early warning

Fourthly, a connection is made between the mutual early warning mechanism in NEC3 contracts and the behaviour of *pro-actively informing* (informing the other party of any issues that may impede realisation of project goals, voicing opinion), *supporting* (co-construction of meaning), *having a critical attitude* (reflecting on outcome and processes; analysing errors), and *quickly resolving problems*. See Figure 15.

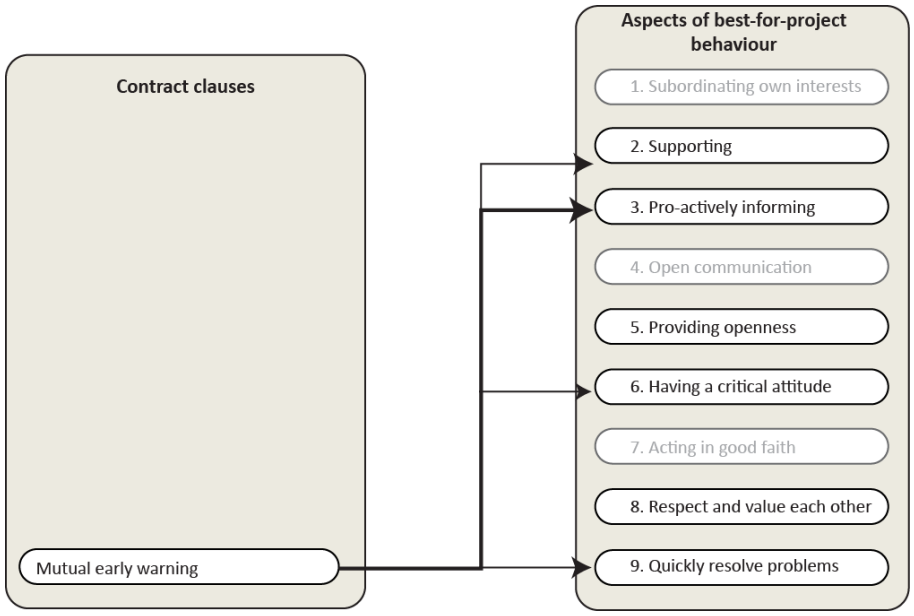


Figure 15: Behaviour associated with the contract clause mutual early warning.

Overall this results in the relations depicted in Figure 16. What can be observed is that in the four cases presented in this chapter, in particular the behaviour of supporting, pro-actively informing and having a critical attitude is stimulated. To a lesser extent this is also the case for providing openness, respect and value each other (dependent on the specific norms and values) and quickly resolving issues. Some aspects of best-for-project behaviour, subordinating own interests, open communication, and acting in good faith, were not recognised as being addressed by the contract clauses.

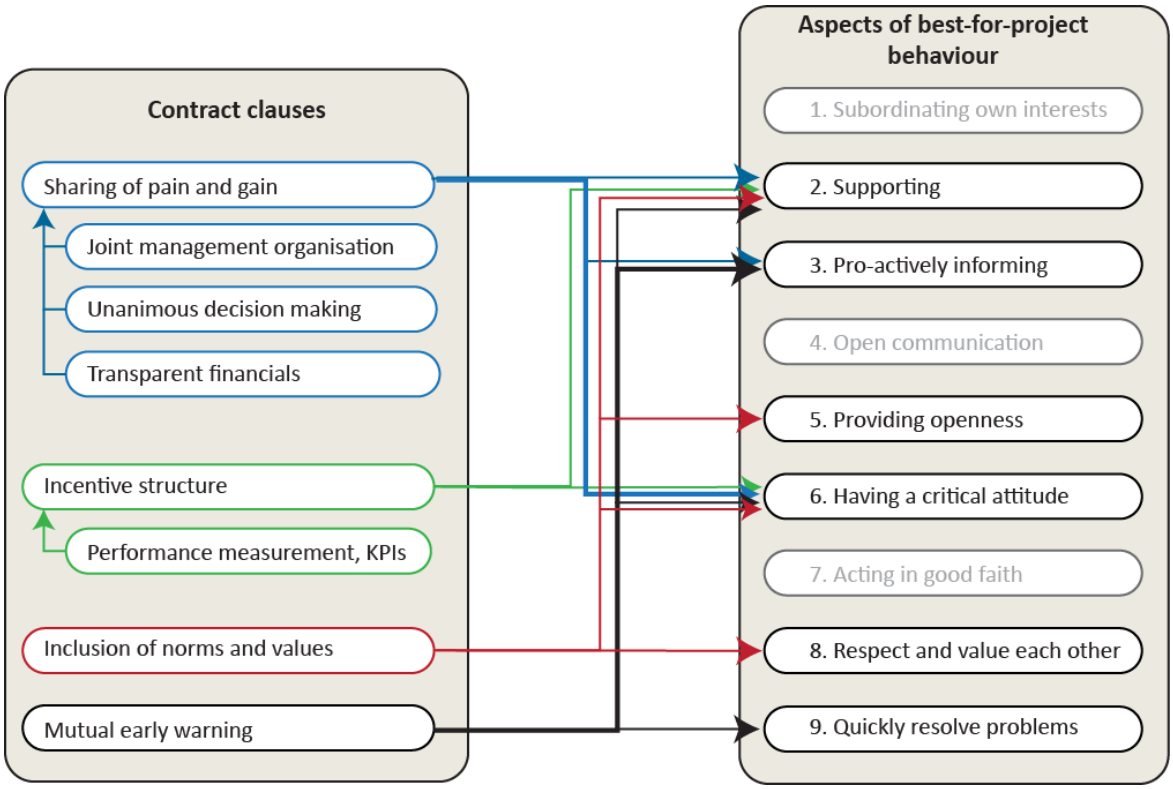


Figure 16: Relations between specific contract clauses (left) and aspects of behaviour (right), based on the interviews.

However, the presence of certain contract clauses alone is not yet a sufficient guarantee. Despite good intentions, the presence of alliance principles (norms and values) and sharing of pain and gain, and positive behaviour related to optimisations, the Alliantie Amstelspoor project still also observed adversarial behaviour (PM AA, AM AA).

7.6.2 Formal and relational: Contractual clauses versus collaborative practices

In addition a number of other aspects were mentioned to be of importance for influencing behaviour. Most of the interviewees support the notion that collaborative practices play an important role in achieving better relations between parties in a project. However there is also a preference to not include relational elements in the contract. For instance, the obligation in the Australian project alliance contract to compose an alliance charter will require parties to fulfil this obligation but does not and cannot impose specific requirements on the content of such an alliance charter. Therefore if parties do not (intrinsically) support such a tool its value is diminished. That raises the question whether it is worthwhile to add such a clause to the contract in the first place.

Hence it is also questionable whether adding specific contract clauses related to e.g. cooperation, such as the NEC3, or desired behaviour have specific merit in daily practice. In the end it depends on how the people in the project team use those contractual elements. There is a chance that those clauses become hollow phrases and that e.g. an obligation to establish a partnering charter or conduct a project start-up (PSU) is simply fulfilled but lacks any meaning.

This does not mean that collaborative practices have no meaning. However enforcing them through a contract is believed not to be the right method. Instead these processes can just as well be arranged by project management.

7.6.3 Staffing & leadership

All interviewees emphasise the significance of the people working on a project. They are the ones who have to execute the agreements laid down in the contract and thus should also be capable of doing so. One of the interviewees also mentioned that in a project alliance the personnel are carefully selected, but that the same approach is not normally used in a D&C contract (TDM AA). Although this topic is not part of the scope of this research, given that all interviewees mentioned this aspect (multiple times), it is definitely an aspect that warrants further investigation in the future.

Finally the subject of leadership was also addressed in relation to adjusting behaviour and proactively addressing relational aspects during the project. Project management should themselves also conduct the behaviour they intend for others to exhibit, and actively and continuously convey their message: 'walk the talk'. It takes a long time for a change in behaviour to be established and this requires continuous monitoring and feedback which should be provided by project management.

7.6.4 Concluding

The main conclusion is that the contract is one aspect of a project. In the end it depends on the way the project team handles the contract. The members of the project team should be willing and capable of fulfilling the obligations established in the contract. Do they follow the contract to the letter or act in the spirit of the agreement? Do they perform as was intended when the contract was written?

Ultimately it is all about how individuals interact, how they handle conflicts. And although this cannot be directly enforced by the contract, the contract can guide the project team by establishing certain processes, and by enticing them to behave in a certain way by means of incentives, sharing of risk and rewards, a common set of norms and values, and an early warning mechanism.

PART IV
SYNTHESIS

Chapter 8: Analysis model for Relationship Contracting Arrangements

Chapter 9: Analysis and categorisation of Relationship Contracting Arrangements

8. ANALYSIS MODEL FOR RELATIONSHIP CONTRACTING ARRANGEMENTS

In Chapter 7 it was found which contract clauses were found to be relevant by practitioners in fostering aspects of best-for-project behaviour. Based on those findings the extensive list of contract clauses established in Chapter 5 is reduced (Chapter 8.1). Next a typology is established, based on those relevant contract clauses (Chapter 8.2).

8.1 KEY CONTRACT CLAUSES

Based on the results of Chapter 7, the relevance of all the contract clauses listed in Chapter 5 was evaluated. Of this list, the following clauses were found to be relevant: sharing of pain and gain, incentives, inclusion of norms and values, mutual early warning.
In addition, a joint management organisation, and unanimous decision making are a precondition for implementation of sharing of pain and gain and should therefore also be present. Transparency & openness is also necessary in case a target contract or alliance fund is applied.

The following contract clauses were thus found to be relevant for influencing behaviour:

1. Sharing of pain and gain
    - Transparency & openness
    - Joint management organisation
    - Unanimous decision making
2. Mutual early warning
3. Inclusion of norms and values
4. Incentive structure

8.2 A TYPOLOGY OF RELATIONSHIP CONTRACTING ARRANGEMENTS

Based on these key contract clauses, a typology for relationship contracting arrangements can be constructed. Starting from transactional, the above contract clauses are added and the extent to which they are present in a category is increased. See also Table 19 and Figure 17. Since sharing of pain and gain is an important element in fostering best-for-project behaviour, a distinction is made between the contracts offering full sharing of pain and gain and those with a limitation in the mechanism (relational 'light' contracts).

- Transactional: No attention to relational aspects, only incentives as a formal contract clause.
- Transactional+: Some attention to specific relational aspects: A general behavioural principle, mutual early warning and an incentive or pain/gain sharing for a very limited scope.
- Relational as philosophy: incentive structure, mutual early warning mechanism, and a set of common norms and values.
- Relational 'light': A limited scope for sharing of pain and gain, incentive structure, mutual early warning mechanism, and a set of common norms and values.
- Fully relational: An all-in, integral approach combining all contract clauses: full sharing of pain and gain, incentive structure, mutual early warning mechanism, and a set of common norms and values.

Table 19: Typology for relationship contracting arrangements. (+/- indicates the category partly addresses a contract clause, ✓indicates it fully addresses a contract clause)

Contract clause	Transactional	Transactional +	Relational as philosophy	Relational 'light'	Fully relational
Sharing of pain & gain		+/- (limited)		+/-	✓
▪ Transparency & openness				+/-	✓
▪ Joint management organisation				+/-	✓
▪ Unanimous decision making				+/-	✓
Mutual early warning		✓	✓	✓	✓
Inclusion of norms and values		+/-	✓	✓	✓
Incentive structure	✓	✓	✓	✓	✓

Figure 17 gives an overview of the categories within the typology, of which contract clauses each category is composed and the expected extent to which it stimulates certain aspects of best-for-project behaviour.

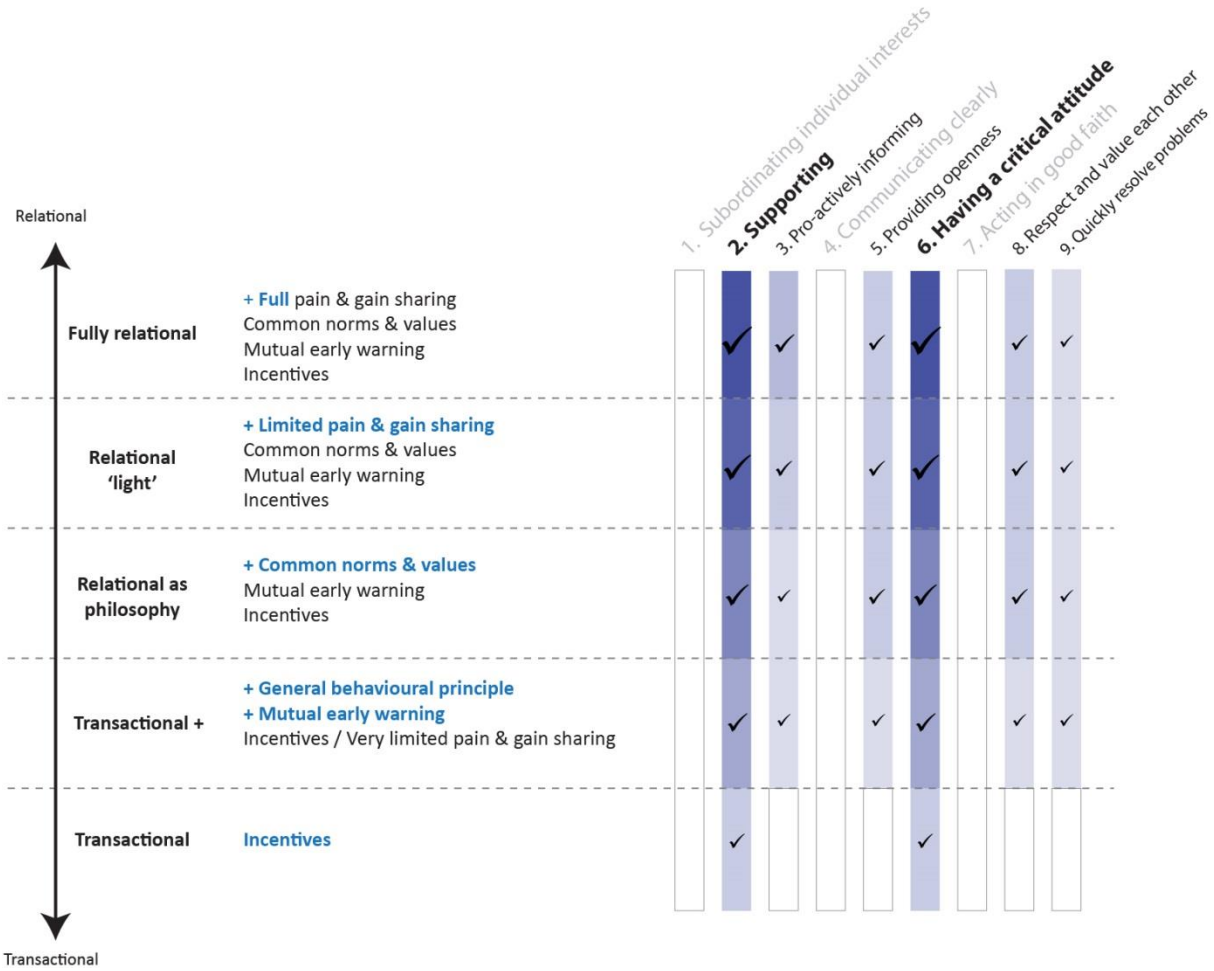


Figure 17: A typology of relational contracting arrangements, indicating the categories, the presence of specific contract clauses within these categories, and the resulting degree of behaviour. Starting from the bottom, new contract clauses are indicated in blue.

9. ANALYSIS AND CATEGORISATION OF RELATIONSHIP CONTRACTING ARRANGEMENTS

With a more thorough understanding of the relevant contractual clauses in mind, an analysis and comparison of the contracts concerning these clauses is made in order to answer sub question 5: *To what extent are the necessary elements and governing mechanics embedded in the various kinds of relationship contracting arrangements?*

First the analysis is discussed, followed by a categorisation based on the typology presented in the previous chapter.

9.1 ANALYSIS OF THE CONTRACT FORMS

The contracting arrangements are compared and analysed as to the extent to which they address the relevant contract clauses (Table 20 and Appendix B).

It can clearly be observed that there are 3 groups.

1. The first group includes the UAC-IC 2005, Design Team and mini-alliance, and does not address almost any of the relevant contract clauses.
2. The second group includes the partnering contracts NEC3, PPC2000 and JCT-CE contracts which do cover most of the relevant contract clauses but primarily as an option.
3. The third group covers the project alliance contracts, project design alliance, IPD, Australian PA. These also address most of the relevant contract clauses but now as standard element of the contract models.

The project alliances thus offer a complete package and most guidance concerning relational aspects. However, the partnering contracts can be extended through various options to become project alliances as well.

Table 20: comparison of forms. Samverkan is excluded here since it is an approach, not a contract (model). For an explanation of the scores see Appendix B.

	UAC-IC 2005	Design Team	Mini-alliance (D&C + pain/gain sharing)	NEC3 ECC	PPC2000	JCT-CE	Project Design Alliance (A2 Hooggelegen)	IPD (AIA-C191 2009)	Australian Project alliance
Sharing of pain and gain	✘	✘	✓ (limited)	✓ (option)	✓ (option)	✓ (option)	✓	+/-	✓
▪ Joint management team	✘	✓	✘	✓ (option)	✓	✓ (option)	✓	✓	✓
▪ Joint decision making	✘	✘	✓ (limited)	+/- (option)	✓ (option)	+/- (option)	✓	✓	✓
▪ Transparent financials	✘	✘	✘	✓ (option)	✓ (option)	✓ (option)	✓	✓	✓
Mutual early warning	✘	✘	✘	✓	✓	+/-	✘	✓	✘
Inclusion of norms and values	✘	✘	✘	+/- (option)	+/-	✓ (option)	+/-	✓	✓
Incentive structure	+/- (option)	✘	+/- (option)	✓ (option)	✓ (option)	✓ (option)	✓	✓ (option)	✓ (option)

9.2 CATEGORISATION

Based on the relevant differences and the typology, the following categorisation is obtained Figure 18.

Fully relational contracts

- The *Australian project alliance* has full sharing of pain and gain, a joint management team with unanimous decision making, an optional incentive structure, and general norms and values as well as requires drafting of an alliance charter. It does not however contain a mutual early warning clause.
- *NEC3 ECC C-F + X12* includes sharing of pain and gain from option C/D, option X12 for the organisation of a joint management team with joint decision making, an optional incentive structure, and mutual early warning mechanism. Other than the general obligation to cooperate (clause 10.1) the contract model does not call for drafting of an alliance or partnering charter.
- *JCT-CE Target Contract + Project Team Agreement* includes sharing of pain and gain as part of the target contract, has a general obligation to work collaboratively and in good faith as well as advices drafting of a project protocol (partnering charter), and has an optional incentive structure. But it has a consultative role for the management team and a less extensive mutual warning mechanism compared to the NEC3 contract.

Relational 'light'

- *Integrated Project Delivery* is largely the same as the pure project alliance, containing a joint management team, unanimous decision making, open book mechanism, and calls for drafting of an alliance charter. It also has mutual early warning. However it only has a gain sharing mechanism.
- The *Dutch project design alliance* has a limited scope for sharing of pain and gain, accompanied by joint management and decision making and open book accounting. It also has a set of alliance principles which establish the basis for the desired behaviour. It does not however call for the formulation of an alliance charter.

Relational as philosophy

- *NEC3 ECC + X12* contains a key principle to act cooperatively and in good faith. Also requires mutual early warning in case of identification of problems, an option to add incentives, and through the X12 option also has a joint management team although without unanimous decision making.
- Similarly, *JCT-CE* has an overriding principle requiring collaboration as key principle. It also contains an option to add incentives and requires the establishment of a joint management team which has an advisory role.
- The *PPC2000* model also requires parties to act collaboratively and in good faith through a key principle. It also has mutual early warning, a joint management team which requires consensus decision making, and an option to add incentives.

Transactional+

- The *NEC3 ECC* in its most basic form still has a key principle to act cooperatively and in good faith and requires mutual early warning, in addition to having an option for incentives.

- The m*ini-alliance* is similar to the UAC-IC 2005 but contains sharing of pain and gain for a very small part of the project. The parties jointly take decisions concerning this specific part of the project.

Transactional

- The Dutch *Design Team* has a joint consultative management team, but is lacking any of the other relevant contract clauses.
- The *UAC-IC 2005* only has an option for an incentive structure, but this is limited to a bonus for early completion, and sanctions for late completion.

Figure 18 presents an overview of the categorisation, along with the aspects of best-for-project behaviour which are fostered through the presence of the specific contract clauses in the various categories.

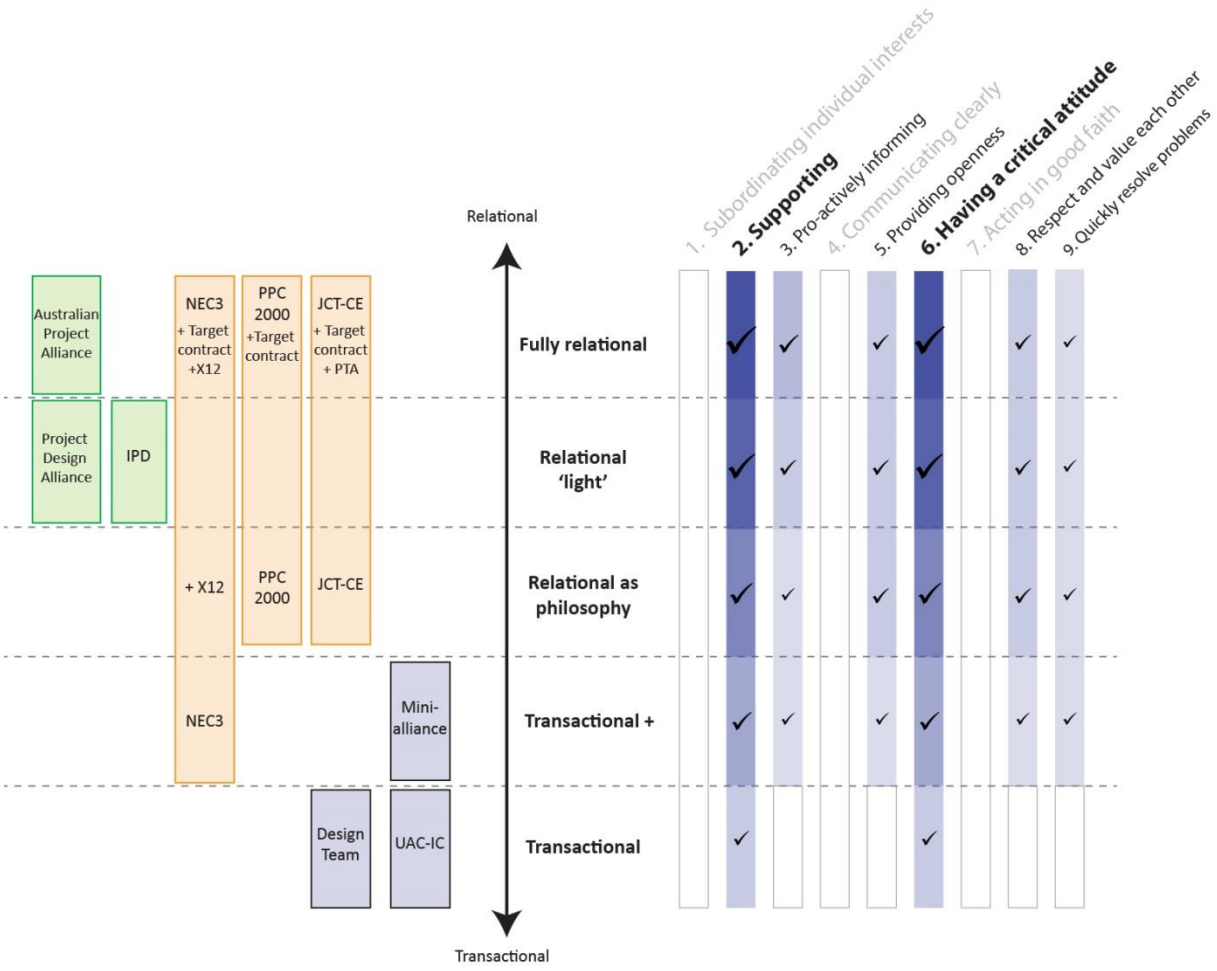


Figure 18: Categorisation of relationship contracting arrangements and the aspects of best-for-project behaviour they foster.

PART V
DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

Chapter 10: Discussion

Chapter 11: Conclusions

Chapter 12: Recommendations

Chapter 13: Reflection

10. DISCUSSION

This chapter provides a discussion of the results from the research.

10.1 THE ROLE OF CONTRACTS FOR INFLUENCING BEHAVIOUR

There are different perspectives on the importance of the contract for steering behaviour. Although one group claims it is important and the other group claims it is not, the two groups are not that far apart. The first group adheres more importance to the conditions the contract sets while the second group emphasises the importance of other factors: having the right people and applying collaborative practices. But both views also acknowledge the relevance the other.

Although sharing of pain and gain, incentives, inclusion of norms and values, and mutual early warning were indicated as being the most important in achieving particular aspects of best-for-project behaviour a different explanation can be that parties have a form of intrinsic motivation to show this behaviour. This was also suggested in the discussion on stewardship theory, and entioned in three of the interviews (TDM AA; EM A2H; CE). Whether it is the company's desire to deliver a showcase project or the professional pride of certain individuals, it can be another explanation of best-for-project behaviour in practice.

This research however found only limited relation between specific contract clauses and specific behaviour. However behaviour is not a topic which is commonly discussed and actively evaluated in construction projects. Therefore it proved difficult to discuss behaviour in relation to contracts and in addition the number of interviews was limited. Therefore it is very well possible that a more significant relation exists. But the influence is likely to be subtle. Furthermore it also becomes relevant how exactly specific clauses in one contract model compare to another and what effects those clauses have for behaviour in projects. This calls for a further investigation of the contract models using a maturity model, similar to that of e.g. Lonneke Cheung (2015).

One key aspect that has not received much attention in this thesis is dealing with risks and scope changes. New risks which have not been allocated are often a source of disputes in projects. Therefore it was proposed that in order to properly deal with those changes, it would be good to take a moment during the project to reassess the risks and allocation of risks. However, this is legally difficult (PM AA; EB).

10.2 THE DUTCH VERSUS THE ANGLO-SAXON APPROACH

The interviewees stressed the importance of addressing certain relational aspects. Whether this should be done by using the contract is a secondary discussion. A clear difference can be observed here in the Dutch and common law approach.

In The Netherlands, the common and generally accepted approach is to exclude relational aspects from the contract. This is different from the common law approach (NEC3, PPC2000, JCT-CE, IPD, Australian project alliance) in which relational aspects are indeed included in the model contracts, in the form of a general collaborative statement, or obligation to formulate a partnering charter.

This can partly be explained by the different perspectives on the use of contracts in general. In Anglo-Saxon culture the contract has a more significant role and it is more common to directly follow the

contract. By lack of a civil code contracts are also more encompassing. In the Dutch construction contracts attention is paid to relational aspects implicitly through the good faith principle in the Dutch civil code. In common law countries on the other hand, the good faith principle is made explicit and listed as the key principle in the contracts. Therefore with the introduction of relational contracts, there are also relational elements included in the contract itself.
In the Dutch project practice people appear to regard the contract as a necessary bother. They acknowledge the importance of arranging the basic exchange conditions but then prefer to use it as little as possible. The contract should thus only include formal agreements. The relational aspects, which are of importance for daily project practice, should then be arranged, non-contractually or in a project management plan (PMP).

Another explanation for the Dutch approach to exclude relational aspects dates back about 10 years. Rijkswaterstaat at that time also included aspects that were not fully SMART. However, there were some difficulties with the accountant who had to judge whether the contractual obligations were fulfilled. For relational obligations that are not SMART (e.g. an obligation to cooperate) this could not be judged. Therefore they were subsequently excluded.

Would the Anglo-Saxon approach work in the Dutch culture? In the Netherlands we are already accustomed to work with a general principle of good faith. Therefore adding a general collaborative statement as a key principle would fit well within our culture. Moreover, it is more explicit and prominent than an abstract principle of good faith in the Dutch civil code.

UAC-IC 2005 versus NEC3

The NEC3 contracts were written with primarily the practice of construction projects in mind. Therefore it also aims to guide construction process, e.g. by obliging parties to have risk meetings and update a risk register. Its use of simple language ensures it can also easily be used by people without a legal background. The UAC-IC 2005 on the other hand is written primarily by lawyers from construction companies in the Netherlands. As a consequence it is in principal written as a legal document. It does not include processes to help guide the construction process. Furthermore it does not state anything about the organisation of the construction project, i.e. which organisation form to use. It leaves much freedom for client and contractor to implement their own processes, but as a consequence it does not provide any guidance to them either (CE).

10.3 DIFFERENT WAYS HOW A CONTRACT IS USED

Lastly the relevance of incorporating relational aspects is also linked to the way the contract is used in practice. For people who often look to the contract it makes sense to include more elements in the contract. But for those who rather use the contract as little as possible, a lean contract with perhaps a separate guide (PMP) is more appropriate.

11. CONCLUSIONS

A present problem in the Dutch construction industry is the often adversarial behaviour between client and contractor, leading to poor project performance. Relationship contracting arrangements are expected to yield better performance through facilitating best-for-project behaviour: behaviour which is beneficial for project performance. But there is no clear definition of 'best-for-project behaviour'. Furthermore there is confusion concerning the terminology used when discussing alliances and partnering which makes it unclear what the contract forms entail and how they compare to one another. Therefore this research investigated which behaviour is beneficial to project performance, which governing mechanisms should be part of a contract in order to foster this behaviour, and therefore which relationship contracting arrangements are capable of fostering this behaviour.

Prior to answering the main research question, the five sub questions are addressed first.

11.1 BEST-FOR-PROJECT BEHAVIOUR AND PROJECT PERFORMANCE

Chapter 3 discussed best-for-project behaviour as the goal of relationship contracting arrangements, thereby answering sub *question 1: What is best-for-project behaviour and how does it influence project performance?*

Projects depend on teamwork and with higher degrees of uncertainty and complexity of projects, the necessity to collaborate also increases. Hence people from different disciplines are involved in projects. These cross-functional teams need to collaborate in order to achieve a successful project. It is necessary for them to communicate, to exchange information about aspects of the project and any problems or risks they may encounter. This interaction is important to be able to achieve project goals.

Through analysis of literature on a number of topics related to team behaviour – behaviour of effective teams, team learning behaviour, as well as references to behaviour in literature on contracting – a number of aspects of behaviour were identified which are beneficial to project performance. These aspects were then aggregated into several categories of behaviour which led to the following definition of best-for-project behaviour[6]:

> Collaboration in service of the project: acting in good faith, with respect for each other, subordinating individual interests to those of the project, **supporting** and **pro-actively informing** each other, by communicating clearly, providing openness of information and intentions, **being critical** towards our work and that of our colleagues, and quickly resolving problems.

This behaviour was found to be beneficial for project performance since it improves the flow of information, the efficiency of (decision making) processes related to problem solving and risk management and the quality of those decisions, and reduces monitoring costs. It also reduces costs related to conflict resolution and litigation. People can focus on their tasks and the issues at hand without being distracted. This increases the efficiency of the construction process, i.e. reduction in time and costs. However, there are other factors that can influence project performance and

[6] The aspects in bold were found to be the most relevant during the interviews.

behaviour is not the sole determinant of project performance, but rather a mediator. Through providing the proper conditions the team is able to handle any situation or problem in the best possible way with the least interference of interpersonal issues, or miscommunication.

It was also investigated how the contract can contribute to achieve this best-for-project behaviour. A contract can impose limitations on an individual's perceived freedom to perform a specific action, for instance through a monitoring or reporting system, or a penalty system. The opposite is also possible. Through rewarding certain behaviour it becomes a more attractive choice for an individual to adopt. This is related to the economic environment: the cost or benefit of behaviour.
It was also found that contracts can influence part of the aspects which were identified as facilitators of effective teams (Chapter 3.3.6) by defining clear project goals, establishing clear roles and responsibilities, and incentive schemes. This leads to common interests, equality through involvement in decision making and a leadership structure focused on involving all parties, and interdependence.

11.2 Typical elements and governing mechanisms for fostering best-for-project behaviour

Chapter 4 investigated which elements and governing mechanisms should be adopted in contracts. It therefore discussed four different perspectives on contracts, in order to answer the second sub question: *Which typical elements and governing mechanisms in the contract are important in fostering best-for-project behaviour, according to theories on contracting (Principal-Agent theory, Stewardship theory, Relational Contract Theory, Transaction Cost Economics)?*

Each theory is based on different assumptions concerning nature of man and the role of the contract. Therefore they offer a comprehensive view and highlight each other's limitations. The four theories on contracting can be divided into two perspectives. The transactional perspective (principal-agent theory and transaction cost economics) claims that formal governing mechanisms are necessary to curb opportunism inherent in man by aligning interests and implementing monitoring systems. The relational perspective (stewardship theory and relational contract theory) on the other hand states that people are not necessarily driven by opportunism but can be intrinsically motivated as well. Hence there is less or even no need for formal governing mechanisms. Instead relational governing mechanisms are introduced to manage the relation between parties.

It was also concluded that principal-agent theory and stewardship theory are complementary and describe opposites. Therefore it was inferred that the combination of the two forms an agency-stewardship continuum. Pure agency on the left of this continuum assumes opportunistic agents which require alignment of goals through incentives and monitoring systems to check their work. On the other side are the stewards who are self-motivated to perform the work of the principal and do not require any governing mechanisms. Individuals are located somewhere in-between, which means there will be at least some degree of opportunism. Too much focus on the agency perspective will mean too much control and distrust. Furthermore, the relation between the parties is dynamic. Through reciprocity of behaviour it is possible to change an agency attitude towards that of a steward by giving the proper example. Showing trust yields trust, but this will take time to develop.

The four theories offered two approaches concerning governing mechanisms: control-oriented or trust-oriented. Since individuals are located somewhere in-between agency (control) and steward

(trust) position, finding a balance between the two approaches is an important challenge. Too much focus on control leads to a loss of flexibility and creativity, and increases governing costs. Too much focus on trust can lead to a loss of focus, lower efficiency, free-riding, and opportunism. Formal and relational are complementary up to a certain point. The formal elements create the ground rules for the project but too much emphasis on these formal elements will be interpreted as a sign of distrust. The trust-oriented or relational approach takes care of processes which are important in shaping the relations between parties.

Formal governing mechanisms consist of formal rules, procedures, and policies aimed at enforcing control, at limiting the opportunities and incentives to deviate from what was agreed on. Relational contract governing mechanisms focus more on the development and maintenance of the relation between different parties through the inclusion of norms and values and codes of conduct, and use of collaborative practices in order to ensure continuance of the relation. The formal and relational elements are summarised in Table 21 below.

Table 21: Overview of formal and relational governing mechanisms. Items marked by an asterisk (*) cannot be addressed through the contract.

Formal governing mechanisms	Relational governing mechanisms

▪ Remuneration scheme
▪ Incentive structure: bonuses & sanctions
▪ Sharing of risk and reward
▪ Monitoring
▪ Transparency
▪ Duties and obligations
▪ Conflict resolution methods
▪ Change procedures
▪ Exit agreements
	▪ Description of the parties involved, their expectations, and interests
	▪ Description of goals of project, agreement, parties
	▪ Inclusion of norms and values
	▪ Putting goals of the project first
	▪ Using increasing trust to reduce the degree of control*
	▪ Informal monitoring through personal relations*
	▪ Personal relationships and team building*, e.g.:
	  ○ Co-location
	  ○ Team-building activities
	  ○ Personnel exchanges and internships

11.3 THE DIFFERENT KINDS OF RELATIONSHIP CONTRACTING ARRANGEMENTS

Chapter 6 investigated the kind of relationship contracting arrangements which are described in literature and are applied in practice. It answered sub question 3: *Which kinds of relationship contracting arrangements can be discerned in literature and practice, and what are their key characteristics?*

Table 22 provides an overview of the relationship contracting arrangements which have been studied, along with their key characteristics. These relationship contracting arrangements are all based on the partnering philosophy and include project partnering contracts and different forms of project alliancing. There are two exceptions in this list. The Dutch UAC-IC 2005 (Uniform Administrative Conditions for Integrated Contracts) is not a relational contracting arrangement but is discussed as baseline for the Dutch construction industry. The Swedish Samverkan is not a project delivery mechanism but instead offers a structured method to implement non-contractual project

partnering. It illustrates an alternative route to achieve partnering benefits within an existing framework of contract models.

Table 22: Overview of relationship contracting arrangements and their key characteristics.

Contract model	Key characteristics
UAC-IC 2005 (baseline)	**Formal contract** ▪ Incentives (option)
Project partnering contracts ▪ PPC2000 ▪ JCT-CE ▪ NEC3 ECC + X12	**Contractually embed partnering principles** ▪ Explicit obligation to collaborate ▪ Mutual early warning obligation ▪ Various options (joing management and decision making, incentives, sharing of pain and gain) to support more extensive collaboration and become alliance contracts.
Project alliancing contracts ▪ Australian (pure) project alliance ▪ Integrated Project Delivery (IPD)	**Comprehensive, integrated approach** ▪ Sharing of pain and gain (Australian project alliance), sharing of gain (IPD) ▪ Set of alliance principles ▪ Joint management team and unanimous decision making ▪ Mutual liability waiver
▪ Project design alliance	**Comprehensive, integrated approach for design phase only** ▪ Limited scope for sharing of pain and gain ▪ Set of alliance principles ▪ Joint management team and unanimous decision making
▪ Mini-alliance	**Additional clause as part of a standard D&C contract** ▪ Sharing of pain and gain for a small number of risks/optimisations
Samverkan	**Non-contractual project partnering approach** ▪ Joint management team and joint risk management ▪ Joint goal setting ▪ Conflict resolution methods ▪ Continuously monitoring project performance ▪ Transparency concerning common matters
Design team	**Early contractor involvement during design phase** ▪ Joint consultative project team ▪ Liability waiver concerning contribution of ideas

11.4 THE INFLUENCE OF THE CONTRACT ACCORDING TO PRACTITIONERS

Chapter 7 discussed the results of the interviews concerning the four cases which were investigated in order to answer s*ub question 4: How do practitioners regard the influence of the contract on best-for-project behaviour?*

Most interviewees consider the contract as an initial and necessary condition. The contract describes the scope of the project, establishes some ground rules and clarifies expectations and obligations of the parties. But the contract is by itself insufficient to achieve the desired behaviour.

The results from the cases show there is definitely an influence of a number of contractual clauses for fostering best-for-project behaviour:

1. **Sharing of pain and gain** (in the form of an alliance fund or target price contract) was found to be primarily useful for achieving optimisations in projects (*having a critical attitude* (search for and propose improvements / optimisations; reflecting on outcome & processes)). It also leads to *pro-actively informing* (informing other party of any issues that may impede realisation of project goals; voicing opinion & offering ideas) and *supporting* (providing help & requesting help) in order to achieve lower costs. Some additional contract clauses are necessary conditions for implementing sharing of pain and gain: transparent financials (open book), a joint management team, and joint decision making.
2. **Incentives** primarily function by bringing focus to the project, aligning the areas which are of primary importance to the client to the financial interest of the contractor. Whether the incentives are achieved is measured through establishing a system of KPIs. This results in the behaviour of addressing each other on issues related to those KPIs (*having a critical attitude* (reflecting on outcome & processes)), and *supporting* (monitoring & correcting errors - providing constructive feedback; providing help & requesting help).
3. **Inclusion of norms and values** was found to lead to *supporting* (co-construction of meaning), *providing openness* (providing full openness on areas necessary for realisation of project goals), *having a critical attitude* (reflecting on outcome & processes; search for and propose improvements / optimisations) and *respect and value each other* (respect each other's interests).
4. The **mutual early warning** mechanism in NEC3 contracts was found to stimulate the behaviour of *pro-actively informing* each other of any problems (informing the other party of any issues that may impede realisation of project goals, voicing opinion), *supporting* each other in addressing those problems (co-construction of meaning), *having a critical attitude in* monitoring for errors (reflecting on outcome and processes; analysing errors), and *quickly resolving problems*.

A number of other topics related to achieving best-for-project behaviour were also identified during the interviews:

- First of all the importance of having people in the project team with a mind-set matching the project philosophy and the capabilities necessary to perform the contractual obligations was stressed during the interviews.
- Secondly the importance of applying collaborative practices as a tool to develop and maintain the relationship between client and contractor and discuss behaviour during the project. This involves doing a project start-up in which e.g. the goals of the project can be explicated, ground rules can be established, a project narrative can be formulated, and team building is initiated. Project follow-ups or other less formal meetings can be used to discuss any issues that may come to pass during the project, but also other 'tools' can be used, including the development of a personal relation which makes it easier to address each other when necessary. And co-location was mentioned as an important method to allow easy and unplanned interaction to occur. However there was also a preference to not enforce the use of such practices through the contract.
- Thirdly the topic of leadership was addressed in relation to adjusting behaviour and pro-actively addressing relational aspects during the project. It was found in Chapter 3 that changing behaviour requires continuous attention. Project management should themselves perform the

behaviour they intend for others to exhibit, and actively and continuously convey the desired behaviour. It takes a long time for a change in behaviour to be established and this requires continuous monitoring and feedback which should be provided by project management.

The contract can evidently not be seen in isolation from these other topics. The project philosophy, procurement process, contract, and selection of project team should all be aligned. Ultimately it is all about how individuals interact, how they handle conflicts. And although this cannot be directly enforced by the contract, the contract can guide the project team by establishing certain processes, and by enticing them to behave in a certain way by means of incentives, sharing of risk and rewards, a common set of norms and values, and an early warning mechanism.

11.5 ANALYSING RELATIONSHIP CONTRACTING ARRANGEMENTS

With a more thorough understanding of the relevant contractual clauses in mind, an analysis and comparison of the contracts concerning those clauses was made in Chapter 9, thereby answering s*ub question 5: To what extent are the necessary elements and governing mechanics embedded in the various kinds of relationship contracting arrangements?*

It was concluded that the relationship contracting arrangements analysed in this thesis could be divided into three groups, based on the extent to which they address the relevant contract clauses.

1. The first group includes the UAC-IC 2005, Design Team and mini-alliance. These contract models do not address almost any of the relevant contract clauses. Only the UAC-IC 2005 possesses a (restricted) option for adding incentives.
2. The second group includes the partnering contracts NEC3, PPC2000 and JCT-CE contracts which do cover most of the relevant contract clauses but primarily as an option.
3. The third group covers the project alliance contracts, Project Design Alliance, IPD, and Australian Project Alliance. These also address most of the relevant contract clauses but now as a standard element of the contract models.

The project alliances thus offer a complete package and most guidance concerning relational aspects. However, the partnering contracts can be extended through various options to become project alliances as well.

Based on this evaluation a categorisation of the various relationship contracting arrangements was made (Table 23).

Table 23: Categorisation of relationship contracting arrangements. Since Samverkan is not a contract model it is not included here.

Category	Contract model	Motivation and key characteristics
1. Project alliance	Australian (pure) project alliance	+ Full sharing of pain and gain, joint management team with unanimous decision making, alliance principles and requirement to draft alliance charter, and incentive structure. - No mutual early warning.
	NEC3 ECC C/D + X12	+ Acting collaboratively and in good faith as key principle, mutual early warning, and incentive structure. Sharing of pain and gain from option C/D, X12 for joint management team and joint decision making.

	JCT-CE Target Contract + PTA	+ Sharing of pain and gain from target contract, incentive structure, acting collaboratively and in good faith as overriding principle, advices drafting of partnering charter. - Consultative role for management team, no unanimous decision making, limited mutual early warning.
2. Alliance 'light'	IPD	+ Sharing of gain, mutual early warning, joint management team with unanimous decision making, alliance principles and requirement to draft alliance charter, and incentive structure. - No pain sharing.
	Dutch project alliance	+ Incentives, set of alliance principles. - Limited scope for pain/gain sharing, joint management and unanimous decision making. No mutual early warning.
3. Partnering contract	NEC3 ECC + X12	+ Acting collaboratively and in good faith as key principle. Mutual early warning. Joint management team with joint decision making from X12.
	JCT-CE	+ Acting collaboratively and in good faith as overriding principle. Joint consultative management team, and incentive structure.
	PPC2000	+ Acting collaboratively and in good faith as a key principle, mutual early warning, joint management team with consensus decision making, and incentive structure.
4. Transactional +	NEC3 ECC	+ Acting collaboratively and in good faith as a key principle. Mutual early warning. Incentive structure.
	UAC-IC + mini-alliance	+ Sharing of pain and gain for a very small part of the project.
5. Transactional	UAC-IC	+ Restricted incentive structure for addition of early completion bonus and/or sanctions.
	Design Team	+ Joint consultative management team.

11.6 WHICH CATEGORIES ARE ABLE TO FOSTER BEST-FOR-PROJECT BEHAVIOUR?

With the categorisation in place, the main research question can be answered: *Which categories of relationship contracting arrangements are able to foster best-for-project behaviour between client and contractor in infrastructure projects in the Netherlands?*

After analysis and comparison of the contracts, the primary conclusion is that relationship contracting arrangements with sharing of pain and gain, an incentive structure, mutual early warning and inclusion of norms and values are best able to foster best-for-project behaviour. This corresponds to the categories of 'fully relational' (Australian project alliance, NEC3 C/D + X12, PPC 2000 target contract, JCT-CE target contract + PTA) and 'Relational 'light'' (Project Design Alliance and IPD). The third category, 'relational as philosophy', however also is capable of fostering the desired behaviour albeit to a slightly lesser extent. In the Netherlands, this category is however not covered by any of the existing contract models. It could therefore be interesting to find a way to cover this gap (see also Figure 19).

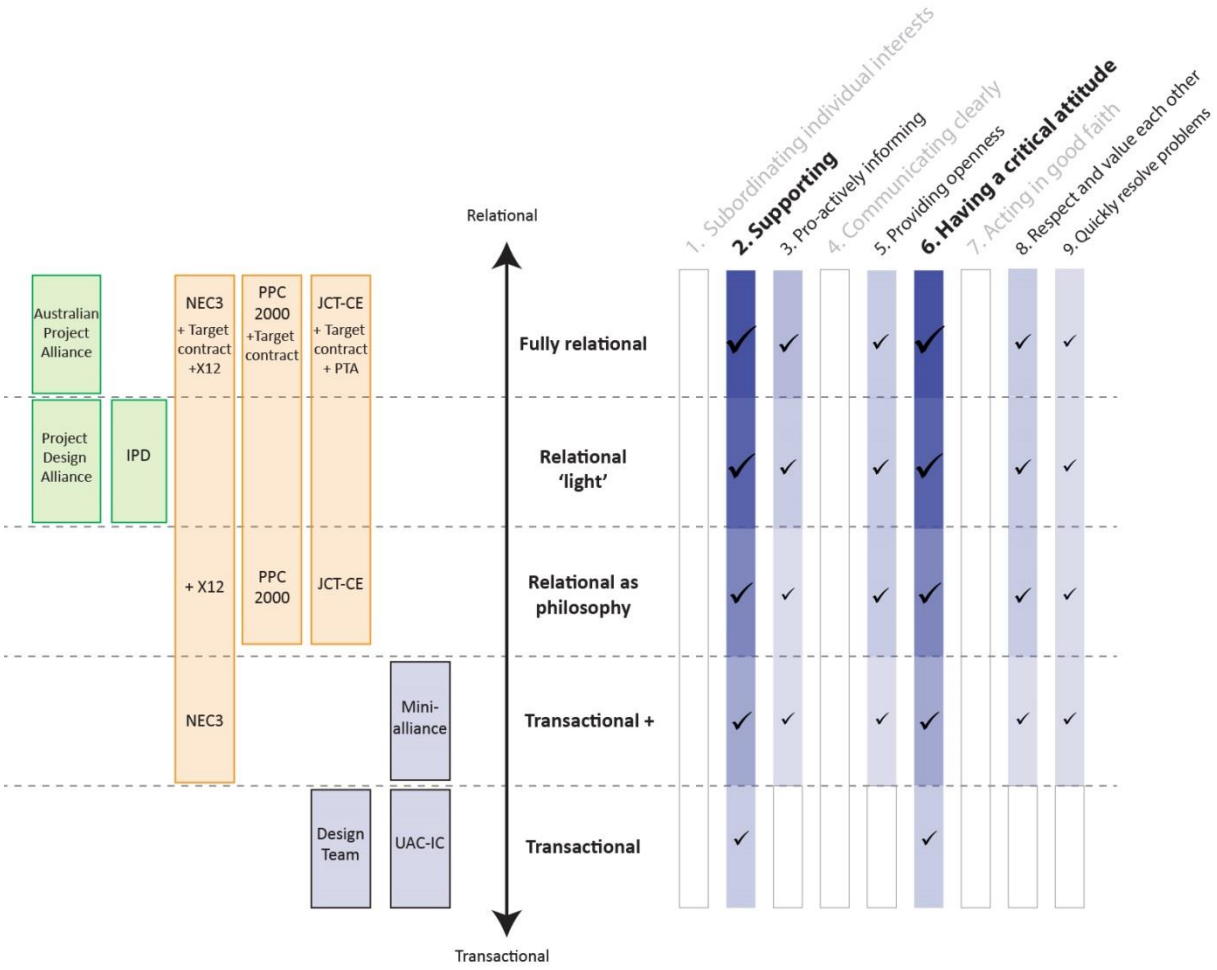


Figure 19: Categorisation of relationship contracting arrangements and the aspects of best-for-project behaviour they foster.

Although these particular relationship contracting arrangements are able to foster specific aspects of best-for-project behaviour, application of the models offers still no guarantees. Instead it also depends on the way the project team uses such a model and whether they have an intrinsic motivation to exhibit the best-for-project behaviour. In addition it was concluded that there are

other aspects that are important for fostering best-for-project behaviour: having the right project team, leadership, and applying collaborative practices. Although this research did not investigate the relative importance of each of these aspects compared to that of the contract in fostering best-for-project behaviour, it is in line with the work of Suprapto (2016) who found contracts to be of limited importance for project performance. Therefore there are other possible ways to achieve this behaviour as well apart from a contractual approach.

The Sluiskiltunnel project, using the UAC-IC 2005, illustrates a non-contractual approach. Despite lacking practically any of the relational elements compared to project alliances, the project management paid close attention to the selection of the project team, the role of leadership, and applying collaborative practices in order to initiate and maintain the relation between parties.

However, it is the author's opinion that a balanced and mature contract model is more likely to yield the desired behaviour than a 'loose' approach such as the Sluiskiltunnel. Perhaps the Swedish Samverkan offers an interesting middle road: the development of a structured approach at the organisational level which adds the important relational elements to the transactional contract models. Such a middle road is currently lacking in the Netherlands.

All three approaches are can work, provided there is a coherent and consistent line from project philosophy, through procurement, contract (type), and project execution with a project team which has a mind-set that meets the project philosophy and chosen contract.

12. RECOMMENDATIONS

This chapter will describe a number of recommendations for Rijkswaterstaat, followed by recommendations for further research. The latter also can be used to contribute to a research agenda for Rijkswaterstaat.

12.1 RECOMMENDATIONS FOR RIJKSWATERSTAAT

- Develop more knowledge about the influence of behaviour, on detecting adversarial behaviour and about tools and tactics which can be applied to achieve behavioural change during projects.
- Apart from applying more project alliances, an alternative route is to develop the potential of project partnering. Given that contract models are difficult to change and that changes to the UAC-IC 2005 which are currently being discussed are likely to be small, it could be interesting to invest in developing a structured non-contractual partnering approach which incorporates best practices, similar to Samverkan.

12.2 RECOMMENDATIONS FOR FURTHER RESEARCH

This thesis has also identified a number of topics for further research.

12.2.1 Behaviour

- This thesis has provided a first exploration of the concepts of behaviour and best-for-project behaviour in particular. However, this has been performed without much prior knowledge in the fields of psychology or organisational psychology. Therefore this topic, and in particular the role and importance of behaviour for project performance, can be developed more thoroughly to determine which type of behaviour is most important for particular aspects of project performance.

  This could be achieved by investigating the behaviour shown in projects that have had good performance, and the behaviour shown in projects that have had poor performance. This shows which behaviour is associated with good or bad project performance. A next step would be to determine which factors (antecedents) cause this specific behaviour, and how to avoid or adjust such behaviour.
- Project partnering and project alliancing in general achieve better results. However, as Tang et al. (2006) state, the way in which partnering and alliancing principles help to achieve better project performance are not clear. Therefore an interesting topic for further research would be to investigate how these principles influence specific project management practices, and which of these partnering/alliancing principles are most important.

12.2.2 The importance of contract clauses

- Through literature study and interviews this thesis identified a number of contract clauses that are considered important to be adopted in the contract for fostering best-for-project behaviour. This analysis can be improved by collecting the opinion of a large quantity of practitioners by making use of the Q-methodology, to measure the strength of the relation between specific clauses and specific behaviour.

12.2.3 Role of the contract

- The interviews yielded a number of other topics which are considered to be of importance in adjusting behaviour. It is currently unclear what the relative importance of each of those aspects is. The causality between each of those factors and achieving specific behaviour should be determined to know what to focus on when considering further research and for improving project practice.
- In infrastructure construction there is an emphasis on the contract. But what is the actual influence of the contract for project performance? This thesis concluded that there are also other factors which are likely to be of importance, and research by Suprapto (2016, pp. iv-v) came to a similar conclusion. He concluded that the influence of contracts is limited and that the parties' attitudes towards collaborative relationships and their translation into team working quality is more important. Further verification is still required.

12.2.4 Procurement process

- The procurement process has not been discussed in this thesis. However, it is an important topic as well. The interviews suggested that the procurement process should be aligned with the project philosophy, and the intended form of collaboration and contract. That means that, if collaboration is considered important for the project, the procurement process should also focus on finding the party and (key) people that share the same principles. In addition, important decisions are taken in the procurement process. Responsibilities, risk allocation, and remuneration are established during the procurement phase. A recent development is a tendency towards earlier involvement of the contractor. The interaction during the procurement phase lays the foundation for behaviour during the project.

  Further investigation of different approaches towards the procurement process and how the initial interaction and attitudes of project parties influences behaviour during the project execution could be an interesting topic for further investigation. How important is the initial interaction and does this influence the remainder of the project in a substantial way?

12.2.5 Subcontractors

- The research in this paper has focused on the interaction between client and contractor. However, during construction much of the work is performed by subcontractors. Agreements which are made between client and main contractor should also be communicated to subcontractors. Van Wassenaer and Thomas (2008, p. 72) point out that a dispute between subcontractor or even sub-subcontractor can escalate and become a dispute between client and main contractor. For instance in a project alliance, the suppliers or subcontractors also need to have a similar mind-set (ProRail, 2011, p. 37).

  Therefore a relevant topic for further investigation is to investigate how agreements between client and main contractor are translated to subcontractors and how to involve the subcontractor in such agreements.
- Another related topic is the diversity in different types of contracts and contract models in a construction project. There are currently a large number of separately developed standard forms of contracts for all kinds of subcontracts. According to Van Wassenaer et al. (2007), a coherent set of contracts for various situations such as the NEC3 family can avoid confusion concerning terminology, responsibilities and obligations and therefore reduce the 'failure costs', the costs associated with errors and rework.

12.2.6 Staffing

- Leadership can also be an interesting research angle. In this thesis it has been used to refer to the role of leadership in achieving the desired behaviour. But leadership itself is also a set of behaviours. The management approach of a project manager (directive or involving) can have important consequences. Therefore some questions related to fostering best-for-project behaviour which can potentially be explored in further research are: Which behaviour of project management is important, which tools and techniques do they apply during the project to steer behaviour of their project team?
- Since the interviewees stressed the importance of having the right team for the project, another topic for consideration is how to select the best team during procurement. And in addition, how to make sure it keeps functioning well during the project itself.

13. REFLECTION

The research identified a number of interesting aspects which provide indicators for a broad research agenda, as presented in the previous chapter. This chapter provides some further reflection on the results and points out some limitations in the research.

13.1 REFLECTION ON RESULTS

- It was concluded that best-for-project behaviour consists of 9 types of behaviour. After analysis of the interviews and the types of behaviour referred to during the interviews, there are some types of behaviour which were referenced most often (supporting, pro-actively informing, and having a critical attitude). It was not investigated in this thesis whether these aspects are the most important for project performance, and therefore should be stimulated through the contract.
- During the analysis of the interviews it turned out that the model of behaviour did not always entirely cover what was being told during the interviews. What was lacking in the list of best-for-project behaviour were aspects related to approaching others (informing how things are going, actively addressing each other's behaviour). At the same time, some aspects were not or barely addressed during the interviews: communication, openness, and exchanging information.
- There can also be external factors which could have contributed to the behaviour in the projects. For instance the Sluiskiltunnel project did not have large external disturbances, but at Alliantie Amstelspoor they did have a very significant scope change. Such circumstances can make it easier for the desired behaviour to manifest itself.
- Risk management and risk allocation was not identified as a parameter in the literature study in chapter 4. However, it is a very important aspect in contracts and in projects. Risk allocation and dealing with new risks when they occur is one of the key issues in projects. Project management is risk management (PD SK), and therefore it is an omission in this thesis (EB). How to deal with these changes should be investigated more thoroughly.

13.2 VALIDITY

- The number of interviews performed was limited due to time constraints. This obviously reflects on the validity and reliability of the conclusions drawn here. Since behaviour can only be observed in real life cases, this is an important limitation.
- A further limitation is that the chosen cases did not possess all the contract clauses that were listed in chapter 5. If a contract clause is not present, there can also not be a link with certain aspects of behaviour. Hence not all contract clauses could be sufficiently established and there are likely to be more relations present.

13.3 REFLECTION ON PROCESS AND METHODOLOGY

- This research did not compare and assess the implementation of the different contract clauses. Therefore despite having similar contract clauses, the implementation in one contract can be (far) better than others, and thus be more capable in fostering best-for-project behaviour than others.

13.3.1 Behaviour as a topic

- Investigating the influence of contracts on achieving certain behaviour has been an interesting angle albeit a difficult one. It is related to the role of the contract, how the contract is used, which people are involved in a project and their attitudes. This research has therefore uncovered a variety of interesting topics.
- The link between contract and behaviour has been a complicated issue. It has been a fundamental assumption at the start of the research, and only a few months into the research did it become apparent that the link between contract and behaviour was not that straight-forward. It is the author's belief that in the end an interesting relation has been found and it would be interesting to see further research into the relation.

13.3.2 On conducting the interviews

- Behaviour turned out to be a difficult subject to discuss. It is not a topic that is commonly discussed in construction industry and the same applies to the interviewer. Although all interviewees acknowledge the importance of people it appears as if the interviewees were lacking sufficient vocabulary to thoroughly discuss behaviour and their strategies to influence behaviour during projects. Hence the discussion at times remained abstract and somewhat conceptual but lacked in depth. Although the interviews have yielded interesting results, it is the author's belief that there is still more knowledge to be gained. The author believes it is also an indication that the topic of behaviour and how it can potentially affect project performance is lacking in attention.

REFERENCES

ACA. (n.d.). Who's Using PPC2000. Retrieved 28 October 2015, from http://www.ppc2000.co.uk/whos_usingppc.html

AGC, AIA, APPA, COAA, & NASFA. (2010). *Integrated project delivery for public and private owners*. Retrieved from https://www.agc.org/sites/default/files/Files/Programs%20%26%20Industry%20Relations/IPD%20for%20Public%20and%20Private%20Owners.pdf

Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes, 50*(2), 179-211.

Anvuur, A. M., & Kumaraswamy, M. M. (2007). Conceptual model of partnering and alliancing. *Journal of Construction Engineering and Management, 133*(3), 225-234.

Architectenweb. (2015). Internationaal Strafhof: megasculptuur in Haagse duinen. Amsterdam: Architectenweb.

Baccarini, D. (1996). The concept of project complexity—a review. *International Journal of Project Management, 14*(4), 201-204.

Baiden, B. K., Price, A. D., & Dainty, A. R. (2006). The extent of team integration within construction projects. *International Journal of Project Management, 24*(1), 13-23.

Bresnen, M., & Marshall, N. (2000). Motivation, commitment and the use of incentives in partnerships and alliances. *Construction Management & Economics, 18*(5), 587-598.

BV KanaalKruising Sluiskil (KKS) Terneuzen, & BAM Infra Nederland bv. (2015). *Sluiskiltunnel Terneuzen. Nieuwe verbinding Kanaal Gent-Terneuzen*. Retrieved from http://www.cob.nl/fileadmin/user_upload/Documenten/PDF/Schreudersprijs/InzendingSchreudersprijs2015_Sluiskiltunnel.pdf

Bygballe, L. E., Jahre, M., & Swärd, A. (2010). Partnering relationships in construction: A literature review. *Journal of purchasing and supply management, 16*(4), 239-253.

Caan, C., & Ingels, K. (2014). Optimalisaties dankzij allianties. *Cement, 2014,* 10-14.

Caers, R., Bois, C. D., Jegers, M., Gieter, S. d., Schepers, C., & Pepermans, R. (2006). Principal-agent relationships on the stewardship-agency axis. *Nonprofit Management and Leadership, 17*(1), 25-47.

Chan, A. P., Chan, D. W., & Yeung, J. F. (2010). *Relational contracting for construction excellence: Principles, practices and case studies*: Routledge.

Chao-Duivis, M. A. B., Janssen, J. G. J., Samkalden, R., Kortmann, C. N. J., Ten Have, F., & Glaser, M. (2007). Verkenning van de mogelijkheden tot toepassing van ALLIANTIES door Rijksgebouwendienst.

Chao-Duivis, M. A. B., Koning, A., & Ubink, A. M. (2008). *A Practical Guide to Dutch Building Contracts*: Instituut voor Bouwrecht.

Chen, G., Zhang, G., Xie, Y.-M., & Jin, X.-H. (2012). Overview of alliancing research and practice in the construction industry. *Architectural Engineering and Design Management, 8*(2), 103-119.

Cheung, L. (2015). *Research into the influence of mutual trust between the Client and the Contractor on the efficiency and the effectiveness of the change management process for complex D&B infrastructure projects using the UAC-IC 2005: Lessons learned from a comparison between the UAC-IC 2005 and the NEC3 ECC and the FIDIC Yellow Book.* (Master), Delft University of Technology, Honselersdijk.

Cicmil, S., & Marshall, D. (2005). Insights into collaboration at the project level: complexity, social interaction and procurement mechanisms. *Building Research & Information, 33*(6), 523-535.

Construction Industry Institute. (1991). In Search of Partnering Excellence. Retrieved 17 May 2016, from https://www.construction-institute.org/scriptcontent/more/sp17_1_more.cfm

CROW. (2013). Toelichting bij Model Basisovereenkomst en UAV-GC. Retrieved from http://kennisbank.crow.nl/Kennismodule/

Davis, J. H., Schoorman, F. D., & Donaldson, L. (1997). Toward a stewardship theory of management. *Academy of Management review, 22*(1), 20-47.

Davison, J., & Ryan, C. (2008). *Partnering Contract Review*. Retrieved from http://www.ppc2000.co.uk/pdfs/arup_partnering_contract_review.pdf

De Hoon, M. W. (2005). *Conflictbeheersing bij opzegging.* UvT Universiteit van Tilburg.

De Man, A.-P. (2013). *Alliances: an executive guide to designing successful strategic partnerships*: John Wiley & Sons.

Dekker, H. C. (2004). Control of inter-organizational relationships: evidence on appropriation concerns and coordination requirements. *Accounting, Organizations and Society, 29*(1), 27-49.

Department of Treasury and Finance Victoria. (2010). *The Practitioners' Guide to Alliance Contracting*. Melbourne: Department of Treasury and Finance, State of Victoria.

Diathesopoulos, M. (2010). Relational contract theory and management contracts: A paradigm for the application of the Theory of the Norms.

Edmondson, A. C., & Lei, Z. (2014). Psychological safety: The history, renaissance, and future of an interpersonal construct. *Annual Review of Organizational Psychology and Organizational Behavior, 1*(1), 23-43.

Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of Management review, 14*(1), 57-74.

FIA Sverige. (2006). *Utökad samverkan: en svensk modell för anläggningsbranschen*. Retrieved from http://www.trafikverket.se/contentassets/4e0c9dadfda948359a2357bc5da3159c/fia_slutrapport_samverkan.pdf

Flyvbjerg, B., Skamris Holm, M. K., & Buhl, S. L. (2003). How common and how large are cost overruns in transport infrastructure projects? *Transport reviews, 23*(1), 71-88.

Fugro. (2014). Optimaal ontwerp door soepele samenwerking. *Fugro Info, 2014*.

Griffiths, P. (2009). *JCT 2005: Clause by Clause*: Butterworth-Heinemann/Elsevier.

Hertogh, M., Bakker, H., De Man, A.-P., & Scholten, R. (2015). *Evaluatie Sluiskiltunnel*. Delft: Sluiskiltunnel & Nederlands kenniscentrum voor ondergronds bouwen en ondergronds ruimtegebruik (COB).

Hertogh, M., & Westerveld, E. (2010). Playing with Complexity. Management and organisation of large infrastructure projects.

Holmberg, R., & Roos, E. (2013). *Selection of project contract for rail infrastructure projects: Identification of the deciding factors for the selection of contract.* (Master of Science), Chalmers University of Technology, Gothenburg, Sweden.

Kadefors, A., & Eriksson, P. E. (2014). *Forskningssammanställning Utökad samverkan/Partnering*. Retrieved from http://www.procsibe.se/dokument/2015/Forskningsoversikt_utokad_samverkan.pdf

Kamminga, P. (2008). *Towards effective governance structures for contractual relations*: Tilburg: Tilburg University.

Kamminga, P. (2009). Welke lessen zijn er te trekken uit empirische studies naar succes en falen van Alliancing en Partnering?(Which Lessons Can be Drawn From Empirical Studies into Alliancing and Partnering Success?). Retrieved from http://ssrn.com/abstract=2294207

Katzenbach, J. R., & Smith, D. K. (2005). The discipline of teams. *Harvard Business Review, 83*(7), 162.

Kent, D. C., & Becerik-Gerber, B. (2010). Understanding construction industry experience and attitudes toward integrated project delivery. *Journal of Construction Engineering and Management*.

Koenen, I. (2013, April 27, 2013). Nieuwe spelregels verbeteren imago - NEC3 slim alternatief voor afspraken in UAV-GC. *Cobouw,* pp. 1,3. Retrieved from http://www.brinkgroep.nl/images/publicaties/pdf/COBOUW_20130427_1_001_article3.pdf

Koenen, I. (2014). Strafhof met transparante uitstraling. Retrieved 8 March 2016, from http://www.cobouw.nl/artikel/1022936-strafhof-met-transparante-uitstraling

Koenen, I. (2015, June 23, 2015). Reportage: 'Veel Britse collega's waren jaloers op ons'. *Cobouw*. Retrieved from http://www.cobouw.nl/artikel/1153756-reportage-%E2%80%98veel-britse-collega%E2%80%99s-waren-jaloers-op-ons%E2%80%99

Koolwijk, J. S. J. (2010). *Risks shared and allocated by construction clients and contractors in Dutch (hybrid) project alliances.* Paper presented at the Proceedings of CIB World International Conference.

Laan, A., Voordijk, H., & Dewulf, G. (2011). Reducing opportunistic behaviour through a project alliance. *International Journal of Managing Projects in Business, 4*(4), 660-679.

Lahdenperä, P. (2012). Making sense of the multi-party contractual arrangements of project partnering, project alliancing and integrated project delivery. *Construction Management and Economics, 30*(1), 57-79.

Langfield-Smith, K. (2008). The relations between transactional characteristics, trust and risk in the start-up phase of a collaborative alliance. *Management Accounting Research, 19*(4), 344-364.

Larson, E. (1995). Project partnering: results of study of 280 construction projects. *Journal of management in engineering*.

Lechner, E. H. S. (2007). *Paden naar gezondheid: bewust naar een gezond gedrag*. Heerlen: Open Universiteit Nederland.

Lloyd-walker, B. M., Mills, A. J., & Walker, D. H. (2014). Enabling construction innovation: the role of a no-blame culture as a collaboration behavioural driver in project alliances. *Construction Management and Economics, 32*(3), 229-245.

Love, P. E., Mistry, D., & Davis, P. R. (2010). Price competitive alliance projects: identification of success factors for public clients. *Journal of Construction Engineering and Management, 136*(9), 947-956.

Marijnissen, M. (2014). *Werking van de TunnelAlliantie*. Retrieved from http://www.anteagroup.nl/sites/default/files/de_werking_van_de_tunnelalliantie.pdf

Marktvisie. (2016, 15 January 2016). Marktvisie. Retrieved January 15 2016, from http://marktvisie.nu/

Melger, A. (2013). Heeft de alliantie toekomst? *OTAR,* 8-11.

Mosey, D. (2010). A decade on from PPC2000: Carry on partnering. Retrieved 28 October 2015, from http://www.building.co.uk/a-decade-on-from-ppc2000-carry-on-partnering/5007235.article

Müller, R., & Turner, J. R. (2005). The impact of principal–agent relationship and contract type on communication between project owner and manager. *International Journal of Project Management, 23*(5), 398-403.

Nabarro. (2012). *A review of the JCT Constructing Excellence form of contract*. Retrieved from http://www.nabarro.com/downloads/jct_constructing_excellence_contract.pdf

NEC. (n.d.). International Criminal Court - Large Project of the Year Winner. Retrieved 8 March 2016, from https://www.neccontract.com/Products/Awards/Large-Project-of-the-Year/International-Criminal-Court

Neerlands diep. (2015). *Eindrapport evaluatie allianties OV SAAL*. Retrieved from http://neerlandsdiep.nl/wp-content/uploads/2015/09/Eindrapport-evaluatie-allianties-OV-SAAL-definitief-030915.pdf

Nicholas, J. M., & Steyn, H. (2012). *Project Management for Engineering, Business and Technology*: Routledge.

Nyström, J. (2005). The definition of partnering as a Wittgenstein family-resemblance concept. *Construction Management and Economics, 23*(5), 473-481.

Pastoriza, D., & Ariño, M. A. (2008). *When Agents Become Stewards: Introducing Learning in the Stewardship Theory.* Paper presented at the 1st IESE Conference, "Humanizing the Firm & Management Profession", Barcelona, IESE Business School.

Petersen, T. (1993). Recent developments in: The economics of organization: The principal-agent relationship. *Acta Sociologica*, 277-293.

Phua, F. T. (2004). The antecedents of co-operative behaviour among project team members: an alternative perspective on an old issue. *Construction Management and Economics, 22*(10), 1033-1045.

Plantinga, H. E. C., & Dorée, A. G. (2013). *Project alliances: an investigation into the logic behind the range of a dutch public sector client's initiatives.* Paper presented at the 29th Annual ARCOM Conference. UK, Association of Researches in Construction Management, Reading, UK.

Poppo, L., & Zenger, T. (2002). Do formal contracts and relational governance function as substitutes or complements? *Strategic management journal, 23*(8), 707-725.

Priest, H. A., Guthrie, J., Burke, C. S., Bowers, C., & Salas, E. (2004). *Are there differences in teamwork across team type?* Paper presented at the Proceedings of the Human Factors and Ergonomics Society Annual Meeting.

ProRail. (2011). *Handboek Alliantiemanagement*. Retrieved from https://www.pianoo.nl/sites/default/files/documents/documents/prorailhandboekalliantiemanagementmei2011.pdf

ProRail. (2014). *Model Basisovereenkomst voor contracten gesloten op basis van de UAV-GC 2005*. Retrieved from http://www.prorail.nl/sites/default/files/01_acm00200-v006.2_model_basisovereenkomst.doc

Queensland Government Chief Procurement Office. (2008). *Relational Procurement Options - Alliance and Early Contractor Involvment Contracts*. Retrieved from http://www.hpw.qld.gov.au/SiteCollectionDocuments/ProcurementGuideRelationalProcurement.pdf

Rijkswaterstaat. (2010). Expeditie A2 Hooggelegen bereikt top. Retrieved from http://www.projectsucces.com/wp-content/uploads/Expeditie-A2-Hooggelegen-bereikt-top.pdf

Rijkswaterstaat. (2015, February 9, 2015). 'Samen krachtig de toekomst in' | Marktdag 2015 | Rijkswaterstaat &. Retrieved 22 July 2015, from http://www.magazinesrijkswaterstaat.nl/zakelijkeninnovatie/2015/01/marktdag-sfeerverslag

Rijnders, S. (2014). *Welke consequenties hebben wijzigingen van de opdrachtgever na het sluiten van het bouwcontract?*

Robbins, S., Judge, T. A., Millett, B., & Boyle, M. (2013). *Organisational behaviour*: Pearson Higher Education AU.

Rowlinson, M. (2015). *Practical Guide to the NEC3 Engineering and Construction Contract*: Wiley.

Sakal, M. W. (2005). Project alliancing: a relational contracting mechanism for dynamic projects. *Lean Construction Journal, 2*(1), 67-79.

Sappington, D. E. (1991). Incentives in principal-agent relationships. *The Journal of Economic Perspectives*, 45-66.

Saunders, K., & Mosey, D. (2005). PPC 2000: Association of consultant Architects standard form of Project Partnering Contract. *Lean Construction Journal, 2*(1), 62-66.

Savelsbergh, C. M., Poell, R. F., & van der Heijden, B. I. (2015). Does team stability mediate the relationship between leadership and team learning? An empirical study among Dutch project teams. *International Journal of Project Management, 33*(2), 406-418.

Shelanski, H. A., & Klein, P. G. (1995). Empirical research in transaction cost economics: a review and assessment. *Journal of Law, Economics, & Organization*, 335-361.

Suprapto, M. (2016). *Collaborative Contracting in Projects.* (PhD), Delft University of Technology.

Tang, W., Duffield, C. F., & Young, D. M. (2006). Partnering mechanism in construction: an empirical study on the Chinese construction industry. *Journal of Construction Engineering and Management*.

Trafikverket. (2015). Samverkan i Trafikverkets kontrakt – TRV basnivå.

Trowlers & Hamlins. (2005). *PPC2000: The ACA Standard Form of Contract for Project Partnering. Introduction and Explanator Notes*. Retrieved from http://www.ppc2000.co.uk/pdfs/PPC2000%20Intro%20only%20Website05.pdf

Van der Geest, E., & Bloemendaal, R. (2011). *Het Experiment A2 Hooggelegen - een geslaagde nieuwe weg*. Den Haag: Veerkracht.

Van der Veen, M. (2009). *Contracting for better places: a relational analysis of development agreements in urban development projects* (Vol. 26): IOS Press.

Van der Veen, M., & Korthals Altes, W. K. (2011). Urban development agreements: Do they meet guiding principles for a better deal? *Cities, 28*(4), 310-319.

Van Leeuwen, K., Van der Veen, R., Huijzer, T., & Maliepaard, V. (2011). *Leren van de A2*. Utrecht: het Convenant 2011 Utrecht.

Van Slyke, D. M. (2007). Agents or stewards: Using theory to understand the government-nonprofit social service contracting relationship. *Journal of Public Administration Research and Theory, 17*(2), 157-187.

Van Wassenaer, A. G. J. (2010). In search for the perfect project. In M. A. B. Chao-Duivis, C. E. C. Jansen, & J. B. M. Vranken (Eds.), *Alleen samen: opstellen aangeboden aan prof. mr. M.A.M.C. van den Berg*. Den Haag: Stichting Instituut voor Bouwrecht.

Van Wassenaer, A. G. J., & Thomas, C. H. J. (2008). *www.werkinuitvoering21.com - Interactief naar een nieuwe generatie bouwcontracten*. Den Haag: Instituut voor Bouwrecht.

Van Wassenaer, A. G. J., Thomas, C. H. J., & Van Geen, H. (2007, March 29, 2007). Weg met alle achterhaalde contracten in de bouwsector. *Financieel Dagblad*.

Van Zuilekom, L. (2015, August 2015). ICC Permanent Premises is uniek in zijn soort. *Stedenbouw, 67,* 31.

Vernieuwing Bouw. (2010). *Richtlijn Samenwerking Rijkswaterstaat-Markt op Integrale Projecten*. Retrieved from https://staticresources.rijkswaterstaat.nl/binaries/Richtlijn%20samenwerking%20Rijkswaterstaat%20-%20markt%20op%20integrale%20projecten%202010_tcm174-335322_tcm21-29405.pdf

Verschuure, J.-K. (2014). Transparante sculptuur in het duinlandschap. *Stedenbouw, 66,* 16-17.

Vis, S. A. (2015). *A study on the feasibility of co-creation between client and contractor in the infrastructure sector - Comparing co-creation with current procurement procedures and integrated contract frameworks.* (Master), Delft University of Technology.

Voordijk, H., de Haan, J., & Joosten, G.-J. (2000). Changing governance of supply chains in the building industry: a multiple case study. *European Journal of Purchasing & Supply Management, 6*(3), 217-225.

Walker, D. H., & Lloyd-Walker, B. (2012). *Understanding early contractor involvement (ECI) procurement forms.* Paper presented at the Twenty-Eighth ARCOM Annual Conference, Edinburgh.

Walker, D. H., & Lloyd-Walker, B. M. (2015). *Collaborative project procurement arrangements*. Newtown Square, PA: Project Management Institute.

Walker, D. H. T., Hampson, K., & Peters, R. (2002). Project alliancing vs project partnering: a case study of the Australian National Museum Project. *Supply Chain Management: An International Journal, 7*(2), 83-91.

Walker, D. H. T., Harley, J., & Mills, A. (2015). Performance of project alliancing in Australasia: a digest of infrastructure development from 2008 to 2013. *Construction Economics and Building, 15*(1), 1-18.

Williamson, O. E. (1979). Transaction-cost economics: the governance of contractual relations. *Journal of law and economics*, 233-261.

Williamson, O. E. (1981). The economics of organization: The transaction cost approach. *American journal of sociology*, 548-577.

Zuidas. (2016, March 21, 2016). Aanbesteding - Zuidas. Retrieved 12 March 2016, from https://www.amsterdam.nl/zuidas/zuidasdok/aanbesteding/

APPENDICES

A. Interview protocol
B. Analysis of contract models
C. Coding scheme interviews
D. Behaviour in cases as mentioned in the interviews

APPENDIX A: INTERVIEW PROTOCOL

Introductie	Doel van vraag

• Voorstelronde
• Toestemming opnemen, vertrouwelijk behandeld
• Uitleg onderzoek & uitleg doel interview
• Kort over het project
  ○ Bijzonderheden
  ○ Verloop algemeen & resultaten
• Rol in het project
	Kennismaking; richting geven aan interview.
	Eventueel aanvullende achtergrondinformatie.

I. Projectfilosofie (het achterliggende idee)	**Achterliggend idee, intentie achter de opzet van het project en contract.**
1. Wat was de projectfilosofie? • Hoe uitte deze filosofie zich in het contract? • Hoe uitte deze filosofie zich in de praktijk? • Stemde dat overeen? Waarom wel/niet?	Hoe is de projectfilosofie doorvertaald? En werkt dat in de praktijk ook zo uit?
2. Wat waren jullie verwachtingen met betrekking tot de relatie tussen OG en ON?	Hoe is men het project ingegaan? Wat was de basishouding?

II. De praktijk: Gedrag binnen het project (resultaat)	Welk gedrag is er geweest?
3. Welk gedrag vertoonden de mensen van OG en ON binnen dit project? (manier van samenwerken) (projectbelang voor laten gaan / elkaar ondersteunen / actief informeren / helder communiceren / openheid geven / kritische houding / handelen in goed vertrouwen (geest van contract) / elkaar respecteren / pro-actief handelen) • Waaraan merkt u dat? (vb) • Was dat constant of veranderde dat? • Wat denkt u dat daarop van invloed is?	Welk gedrag vertonen de mensen op het project? En hoe uit zich dat?
4. Hoe ging men met elkaar om als er problemen/ conflicten waren? (vb) • Wat was hierop van invloed?	Hoe houden de intenties zich onder druk? (Conflict moet substantieel genoeg zijn)
5. Op welke manier is er gestuurd op het gedrag van OG en ON? (Contract / incentives / partnering charter/ management tools / teambuilding / PSU & PFU etc….) • In het contract? • Daarbuiten? • Welk effect heeft dat gehad op het gedrag?	Wordt er specifieke aandacht besteed aan het gedrag en interactie? En op welke manier? Alleen contract of ook andere middelen?

III. De praktijk: Het contract (wat staat erin)	Aanwezigheid en belang van bepaalde clausules, en het effect daarvan
6. Wat waren naar uw mening de **belangrijkste elementen** in het contract om te sturen in het gedrag? • Waarom?	Belang van bepaalde clausules. Waar ligt de nadruk op?

7. Welke **incentives** waren er in het contract opgenomen? • Wat was het doel van deze incentives? • Wat denkt u dat daar het effect van is geweest?	Testen van belang dat aan incentives wordt gehecht.
8. Hoe waren de **verantwoordelijkheden en risico's** verdeeld? • Wat denkt u dat daar het effect van is op het gedrag?	
9. Hoe was de **managementstructuur** ingericht? • Hoe worden belangrijke besluiten genomen? (gedeeld: ja/nee, consensus/ unaniem) • Wat denkt u dat daar het effect van is op het gedrag?	
10. Welke **andere afspraken** waren er in het contract gemaakt? (no-litigation, transparantie, early warning, joint goal setting, communicatie, conflict resolution, normen en waarden) • Waarom? • Wat denkt u dat daar het effect van is op het gedrag?	Wat is er verder in het contract geregeld?
11. Zou u in dit project geholpen zijn geweest met bepaalde extra clausules? • En andersom: Heeft het contract bepaalde beperkingen opgelegd?	Wat had er beter/anders gekund?
12. Is er specifiek aandacht besteed aan de **bemensing**? • Zo ja, op welke manier? • Welk effect heeft dat gehad?	Is er gestuurd op de selectie van de juiste mensen?

IV. Contract en gedrag (algemeen, reflectie)	
13. Welk **type gedrag** is volgens u het meest belangrijk voor een soepel verloop van het project?	Weging in gedrag bepalen
14. Wat is volgens u in het algemeen de mate van **invloed** van het **contract** op het gedrag in een projectteam? (evt. 0/25/50/75/100%) ○ Hoe werkt dat? ○ Welke andere aspecten spelen een rol?	Verifieren van de aanname dat het contract een belangrijke invloed heeft op het gedrag in een project.
15. Gedroegen mensen zich anders in dit project dan in een vergelijkbaar project met de UAVgc (D&C)? • Waar denkt u dat dat door komt?	Hoe anders was dit project ten opzichte van de UAVgc?

Afsluiting	
• Uitwerking en ter validatie sturen • Anonimiteit / vertrouwelijkheid gegarandeerd • Eventuele aanvullende vragen per mail? • Interesse in eindrapport?	

APPENDIX B: ANALYSIS OF CONTRACT MODELS

		UAV-gc	Mini-alliance (ProRail basisovereenkomst o.b.v. UAVgc)
Context & Goals	Description of the parties involved	N/A	See UAV-gc
	Explication of interest of project and parties	N/A	See UAV-gc
	Description of goals of project, agreement, and parties	**Art 3: Specifications from the owner, to be added** **Art 2: Commission, the works, long-term maintenance, price, date of completion, and acceptance.**	See UAV-gc
	Putting goals of the project first	N/A	See UAV-gc
Interaction	Inclusion of norms and values	[only implicitly the applicability of good faith as a general (supra-contractual) norm: DCC 6:2 and DCC 6:248]	See UAV-gc
	Mutual liability waiver	N/A	See UAV-gc
Organisation structure	Joint management team	N/A	See UAV-gc
	Duties and obligations	**Art 5: Design work** **Art 6: Permits and/or licences, exemptions, orders and permissions** **Art 7: information and goods put at the disposal of the contractor** **Art 3: obligations employer** **Art 4: obligations contractor** **Art 9: Permits, exemptions, orders and permissions, obligations of Client** **Art 10: Permits, exemptions, orders and permissions, obligations of Contractor** **Art 11: Legal conditions and orders** **Art 12: Health and safety** **Art 13: Soil and site**	See UAV-gc
	Joint decision making	N/A	See UAV-gc
	Mutual early warning	**Art 44-1(c): Obligation to warn** <Only one sided>	See UAV-gc
	Pre-agreed conflict resolution methods	**Art 18: Dispute adjudication board** **Art 47: conflict resolution**	See UAV-gc
Remuneration	Payment	**Art 2.4: Price** **Art 10: Settlement of changes in wages, salaries, social security charges, prices, rent and carriage costs** **Art 14: Payment procedures** **Art 15: Provisional sums** **UAC-IC art 33: payment** **UAC-IC art 34: provisional sums** **UAC-IC art 35: taxes** **UAC-IC art 44: Reimbursement and/or term extension**	See UAV-gc

	Incentive structure	**Art 16: Penalty clause and bonus** **UAC-IC art 36: penalty clauses and bonus** [Only an option for early completion]	See UAV-gc
	Sharing of pain and gain	N/A	**Art. 25 Risicodeling** **25.7** (...) spreken partijen af dat zij voor gelijke delen participeren in het positieve of negatieve resultaat van de in deze paragraaf bedoelde afwijking van de stelpost, (...) **Art. 26 Optimalisaties** **26.7** Partijen participeren voor gelijke delen in de besparing. (…)
Monitoring & Control	Performance measurement, KPIs	N/A	See UAV-gc
	Transparency & openness	**UAC-IC art 44-1(c): Obligation to warn**	See UAV-gc
Flexibility	Change procedures	**UAC-IC art 14: changes by client** **UAC-IC art 15: Changes by contractor** **UAC-IC art 45: Procedure resolving consequences changes by client**	See UAV-gc
	Exit agreement	**UAC-IC art 16**	See UAV-gc

		Design Team	NEC3 ECC
Context & Goals	Description of the parties involved	N/A (only names)	contract data: Part one - Data provided by the Employer Part to - Data provided by the Contractor
	Explication of interest of project and parties	N/A	N/A
	Description of goals of project, agreement, and parties	**Preamble** (Dutch: considerans) **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. **Article 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.	**Option X12**: Part one - Data provided by the Employer The Client's objective is.... (to be filled out)
	Putting goals of the project first	N/A	N/A
Interaction	Inclusion of norms and values	N/A	**§ 10.1** The Employer, the Contractor, the Project Manager and the Supervisor shall act as stated in this contract and in a spirit of mutual trust and co-operation. **X12.3 (1)** The Partners work together as stated in the Partnering Information and in a spirit of mutual trust and co-operation. < Only refers to the general obligation to cooperate. No direct reference to a partnering charter or alliance charter >
	Mutual liability waiver	**Article 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 < sort of resembles a no-litigation clause >	N/A
Organisation structure	Joint management team	**Samenstelling van het Bouwteam** Article 2	**X12.2 (4)** The Partners select the members of the Core Group (…)

	Duties and obligations	**Article 5: Role of Client** **Article 6: Role of contractor**	**§ 16 Early warning** < obligation for contractor and project manager to inform each other as soon as they become aware of matters that could negatively affect the project. Also discusses risk reduction meetings > **§ 17** < obligation for Contractor or Project Manager to notify the other of any inconsistency or ambiguity in or between documents. > **§ 18** <obligation for contractor to inform project manager of any impossible requirements> **Ch 2 Contractor's main responsibilities** **Ch 3 Time** < contains obligations related to planning and schedules >
	Joint decision making	N/A **Article 5 and 8**: <client takes decisions>	**X12.2 (3)** The Core Group acts and takes decisions on behalf of the Partners on those matters stated in the Partnering Information.
	Mutual early warning	N/A	**§ 16: Early warning** <Obligation for contractor and project manager to inform each other as soon as they become aware of matters that could negatively affect the project. Also discusses risk reduction meetings> **X12.3 (3):** Each Partner gives an early warning to the other Partners when he becomes aware of any matter that could affect the achievement of another Partner's objectives stated in the Schedule of Partners.
	Pre-agreed conflict resolution methods	**Article 24:** refers to a general arbitration method	**Option W1 / Option W2** <2 options for dispute resolution, 1 should be chosen: > Uses adjudicator
Remuneration	Payment	**Article 17.3:** <Percentage fee for general costs.> **Article 23:** [Remuneration in case client and contractor cannot reach agreement on a price for the construction phase]	**Ch 5 payment procedure**
	Incentive structure	N/A	**Option X6:** Bonus for early Completion **Option X7:** Delay damages **Option X17:** Low performance damages
	Sharing of pain and gain	N/A	**53: The Contractor's share** (option C) <Option to share the financial risk by means of a pain/gain share mechanism in ECC main option C and D (target contract)>
Monitoring & Control	Performance measurement, KPIs	N/A	**Ch 4 Testing and Defects** [test procedures, defects, repairing defects] **Option X20: Key Performance Indicators (not used with Option X12)**
	Transparent financials	N/A (only regarding the budget for execution of the works)	<Open book regarding the Contractor's cost data in Main Options C-F> **§ 52.3** The Contractor allows the Project Manager to inspect at any time within working hours the accounts and records which

			he is required to keep. (option C)
Flexibility	Change procedures	N/A	**Ch 6: Compensation Events**
	Exit agreement	**Article 22** **Article 23**	**Ch 9: Termination** § 91 Reasons for termination § 92 Procedures on termination

		PPC 2000	JCE-CE
			CP = contract particulars C = conditions PTA = project team agreement
Context & Goals	Description of the parties involved	<Only names>	N/A (Articles of agreement: only name + company address) (CP: CP part 1) (PTA: only name + company address) PTA Part 3: individual contract between project team members <An overview of the parties and the works and/or services being provided under the contract>
	Explication of interest of project and parties	**Clause 1.1** The Project and the Site are further described in the Project Brief and the Project Proposals <According to the guide, the project brief should contain a.o. "The client's objectives for the project (clause 4)"> **Art 4.2 Partnering Targets** <General aspects of good project management, linking to the Egan report "Rethinking Construction".> **4.1 Partnering objectives** The Partnering Team members shall establish, develop and implement their partnering relationships in accordance with the Partnering Documents, with the objectives of achieving for the benefit of the Project and for the mutual benefit of Partnering Team members:- (...)	CP 1·1 General description of the project CP Part 1: general description of the project <very short description> PTA Agreement particulars Part 1: general description of the project Part 2: brief (to be attached) List of documents which compose the project brief Part 3 services (?)
	Description of goals of project, agreement, and parties	Project brief as appendix of the partnering agreement <to be added>	Part 2: brief (to be attached)
	Putting goals of the project first	N/A	N/A

Interaction	Inclusion of norms and values	**Clause 1.3:** The Partnering Team members shall work together and individually in the spirit of trust, fairness and mutual cooperation for the benefit of the Project, within the scope of their agreed roles, expertise and responsibilities as stated in the Partnering Documents. **4.1 Partnering objectives** The Partnering Team members shall establish, develop and implement their partnering relationships in accordance with the Partnering Documents, with the objectives of achieving for the benefit of the Project and for the mutual benefit of Partnering Team members:- (i) trust, fairness, dedication to common goals and an understanding of each other's expectations and values; <According to the guide, the project brief should contain a.o.. "The client's expectations (...) including a section dealing with the Client's expected conduct of Partnering Team members on and off Site (clauses 1.3, 1.5 and 1.6)">	C Section 2: Working together 2·1 t/m 2·11 **C 2·1 Overriding principle** The purchaser and the supplier and the parties to the PTA will "work together with each other and with all other project participants in a co-operative and collaborative manner in good faith and in the spirit of mutual trust and respect". **PTA Section 2: working together as the Project Team** < overriding principle > Section 4: obligations of the supplier. < All members of the supply chain should also acct in accordance with the 'overriding principle' > Section 5: Allocation of risks > < includes a section on how parties have to deal with each other in case of the occurrence of a Relief Event >
	Mutual liability waiver	N/A	**CP 2·9 Exclusion of liability**
Organisation structure	Joint management team	**Art 3.3: Core Group and members**	**CP Part 3 Table C: The Project Team** <Composition of project team>
	Duties and obligations	Art 2.5: (...) to warn each other and the Client Representative of any error, omission or discrepancy of which they become aware and (within the scope of their agreed roles, expertise and responsibilities) to put forward proposals to resolve any such error, omission or discrepancy fairly and constructively within the Partnering Team without adversely affecting the agreed cost or time for completion or quality of the Project **Art 3.7: Early Warning** The Partnering Team members shall operate an Early Warning system, whereby each Partnering Team member shall notify the others as soon as it is aware of any matter adversely affecting or threatening the Project or that Partnering Team member's performance under the partnering Contract and shall include in such notification proposal's for avoiding or remedying such matter. (...)	C Section 3: Primary obligations of the purchaser C Section 4: Primary obligations of the supplier C Section 5: Allocation of risks Duty to warn in case a risk that has been identified in the Risk Allocation Schedule occurs. CP 8.1 Risks to be covered by insurance Supplier and Purchaser C Section 8 Insurance C 8·1 Duty to insure

	Joint decision making	**Art 3.6: Core Group decisions** Decisions of the Core Group shall be by consensus of all Core Group members present at that meeting. The Partnering Team members shall comply with any decisions of the Core Group made within the scope of its agreed functions. **Art 3.8: Partnering Team meetings and decisions** (...) Decisions of a Partnering Team meeting shall be by consensus of all Partnering Team members present at that meeting.	**PTA 2·6 Role of the Project Team** The role of the Project Team shall be advisory. Each Party shall give due consideration to the recommendation of the Project Team. < Only an advisory role, not compulsory >
	Mutual early warning	**Art 3.7: Early Warning** The Partnering Team members shall operate an Early Warning system, whereby each Partnering Team member shall notify the others as soon as it is aware of any matter adversely affecting or threatening the Project or that Partnering Team member's performance under the Partnering Contract, and shall include in such notification proposals for avoiding or remedying such matter. The Client Representative shall convene a meeting of the Core Group within five (5) Working Days from the date of any such notification unless all Core Group members agree an alternative course of action. **18.4: Notification of Events** The Constructor shall:- (i) notify the Client Representative as soon as it becomes aware of any of the events described in clause 18.3 (...)	**C 5·4: Notification of occurrence of risks identified in the Risk Allocation Schedule** If a risk identified in the Risk Allocation Schedule occurs, whichever of the Purchaser or the Supplier becomes aware of the occurrence of the relevant risk shall immediately notify the other and both shall cooperate to agree the best means of dealing with any adverse consequences of the occurrence of the risk and to mitigate its effects, whether or not the occurrrence of the risk also consitutes a Relief Event.
	Pre-agreed conflict resolution methods	**Art 5.6 and 27.4: partnering advisor** **Art 27: Problem solving and dispute avoidance or resolution.**	CP 11·2: Negotiation between senior executives CP 11·3: Adjudication Section 11: Dispute Resolution Step 1: warn of upcoming conflict Step 2: Escalate and negotiate, positive advice for mediation, or involvement of project team Step 3: Adjudication Step 4: Litigation
Remuneration	Payment	**Art 12 Prices** <Profit, Central Office Overheads and Site Overheads> **Art 20: Payment**	**CP 7: payment terms** < Two options: Contract sum (lump sum), Target costs > **CP Part 7: Payment terms** Payment terms Target Cost Option "The minimum records that...> **Section 7: Payment** Target Cost (7-2 t/m 7-15) or Contract Sum Option (7-16 t/m 7-24)
	Incentive structure	**Art 13: Incentives** **Art 13.5: performance against KPIs**	CP 7-28: Bonus for early completion (option) C 7-28: Bonus for early completion
	Sharing of pain and gain	**Art 13.2: Shared savings and added value incentives** (...) Any cost savings or demonstrable added value proposed by one or more Partnering	**Section 7: Payment** < AC < TC: parties share the difference according to Contract Particulars. TC < AC < GMC: contractor shares pain

		Team members and approved by the Client on the recommendation of the Core Group shall be subject to such shared savings arrangements and/or added value incentives.	AC > GMC: contractor does not get paid for this excess amount GMC = Guaranteed Maximum Cost. > <niet helemaal zeker dat dit klopt> PTA Part 4: details regarding any risk and reard sharing agreements between the parties Definition of construction costs + professional fees and expenses resulting in the project target cost. Calculation sheet with sharing ratio for surplus or deficit
Monitoring & Control	Performance measurement, KPIs	**Art 13.5: Payment and KPIs** < performance against KPIs > **Art 23: Key Performance Indicators and continuous improvement** **APPENDIX 8 - KPIs and Targets**	**CP 6: Key Performance Indicators** **CP Part 6: Key performance indicators** For supplier and purchaser < KPIs can be included if desired. > C Section 6: Measurement of Performance
	Transparency & openness	**Art 3.1:** Cooperative exchange of information The Partnering Team members shall work together and individually, in accordance with the Partnering Documents, to achieve transparent and cooperative exchange of information in all matters relating to the Project and to organise and integrate their activities as a collaborative team. **Art 3.11: Records** The Partnering Team members shall keep such records of their activities in relation to the Project as are required by the Partnering Documents and, subject to clause 25.5, shall permit inspection of their activities and records in relation to the Project by other Partnering Team members and by any third parties stated in the Project Brief.	in case of using Target Costs: C 7-2: Open book recording of costs C 7-3 Acces to original vouchers and books of account C 7-4 Regular breakdowns of Actual Cost
Flexibility	Change procedures	**Art 17: Change**	CP 5-7-4: Relief events For target cost C 7-14 Additions to Target Cost and Guaranteed Maximum Cost C 7-15 Reductions from Target Cost and Guaranteed Maximum Cost For contract sum option: 7-23 Adjustments to Payment Schedule and Contract Sum
	Exit agreement	**Art 26: Termination**	**Section 10 Termination**

		A2 Hooggelegen	IPD
Context & Goals	Description of the parties involved	N/A (only names of companies)	N/A (only names of companies)
	Explication of interest of project and parties	**Overeenkomst Deel 1: Bedoeling partijen** 1. Het Project houdt in het in Samenwerking in Alliantieachtig Verband tussen Rijkswaterstaat en [..] realiseren van; 2. Het Project is een onderdeel van een samenhangend pakket aan maatregelen om de doorstroming van het verkeer op ... te verbeteren; 3. Rijkswaterstaat heeft een aantal Kritische Succesfactoren geformuleerd voor de uitvoering van het Project, die betrekking hebben op het beperken van verkeershinder, op het waarborgen van veiligheid, op het tijdig beschikbaar stellen van het Project, op kwaliteit, op imago en op budget. Deze luiden als volgt: (...)	N/A
	Description of goals of project, agreement, and parties	**Overeenkomst Deel 1: Bedoeling partijen**	N/A
	Putting goals of the project first	**Deel 2: alliantiebeginselen:** Het Beste voor het Project: alle beslissingen en handelingen binnen de Samenwerking in Alliantieachtig Verband zullen zijn gebaseerd op het principe: “het Beste voor het Project”;	**§ 2.1.1**. (...) The Project Executive Team shall exercise its authority in the best interests of the Project. The Project Executive Team may delegate its responsibilities to others, including the Project Management Team, if in the view of the Project Executive Team such delegation is in the best interests of the Project. (...)
Interaction	Inclusion of norms and values	**Deel 2: alliantiebeginselen:**	**§ 1.1.1** The parties intend that the Project shall be delivered in a collaborative environment and shall endeavour to align individual interests with those of the Project. The Parties agree to contribute their knowledge, skill and services during all phases of the Project and to bring to bear their expertise for the benefit of the Project. The Parties shall collectively act to establish and accomplish mutually agreed-upon Project Goals that they shall set forth in the Target Criteria Amendment to this Agreement.
	Mutual liability waiver	N/A	**§ 8.1** General Waivers of Claims and Liability < + exceptions > **§ 8.2.1** Waiver of Claims for Consequential Damages **§ 8.2.2** Waivers of subrogation **§ 8.3** Indemnification against Claims for Property Damage or Bodily Injury **§ 8.4** Indemnification against Third-Party Claims for Vicarious Liability

Organisation structure	Joint management team	**3. SAMENWERKING IN ALLIANTIEACHTIG VERBAND – ORGANISATIE** **3.2 Projectorganisatie** **3.4 Alliantiebestuur** **3.5 Alliantiemanager, Alliantiemanagementteam en Alliantiekantoor** **Bijlage 2 Projectorganisatie** **1. Alliantiemanagementteam** <Samenstelling, reglement (o.a. unanimiteit)> **2. Alliantiebestuur** <Samenstelling, reglement (o.a. unanimiteit)>	**Article 2**: management of the project **§ 2.1.3** Composition of project executive team **§ 2.2** Project management team
	Duties and obligations	2**. KERNVERPLICHTINGEN PARTIJEN** **2.1 Verplichtingen Private Partner** **2.2 Verplichtingen Publieke Opdrachtgever**	**Article 2**: Management of the project **Article 3**: responsibilities and parties **§ 3.1** Collaboration responsibilities <requirement to... + to be determined > **§ 3.2** Owner responsibilities **§ 3.3** Architect responsibilities **§ 3.4** Contractor responsibilities **§ 3.5** Additional party responsibilities < optional, to be defined> **§ A2.2** Owner **§ A2.3** Architect **§ A2.4** Contractor
	Joint decision making	**1.5 Consensus** Besluiten binnen de Samenwerking in Alliantieachtig Verband worden in consensus genomen.	**§ 2.1.2** Decision making of Project Executive Team must be unanimous **§ 2.2.3** Decisions by the Project Management Team shall be unanimous.
	Mutual early warning	**13. BIJZONDERE OMSTANDIGHEDEN** **13.1 Kennisgeving van een Bijzondere Omstandigheid** (a) Als de Partners hun verplichtingen op grond van deze Overeenkomst niet tegen de overeengekomen voorwaarden kunnen nakomen als gevolg van een Bijzondere Omstandigheid, moeten de Partners elkaar c.q. de Publieke Opdrachtgever zo spoedig mogelijk op de hoogte stellen van: (i) De gebeurtenissen of omstandigheden die de Bijzondere Omstandigheid vormen; (ii) De verplichtingen op grond van deze Overeenkomst die daardoor onvermijdelijk niet of slechts tegen hogere kosten kunnen worden nagekomen; en (iii) Als daar sprake van is, een specificatie en de verwachte duur en de door de Bijzondere Omstandigheid ontstane Kritieke Vertraging.	**§ 2.4.2:** The Parties acknowledge that timely sharing of relevant Project information among the Parties and, when relevant and applicable, among other Project participants, is important to the success of the Project. (…) **§ 5.4.3:** If any Party comes to believe or acquires information to suggest that the Target Cost may be exceeded for reasons that do not justify an adjustment to the Target Cost under Section 5.3, it shall immediately notify the other Parties in writing, setting forth the basis for its belief and any pertinent information acquired.
	Pre-agreed conflict resolution methods	**1.7:** Voorkomen en vermijden van geschillen **18.2:** Rechtspraak is “ultimum remedium”	**§ 2.3 Issue resolution** <obligation to jointly develop protocols for issue resolution > **§ 9: Dispute resolution** <escalation level above article 2.3
Remuneration	Payment	**11. Betalingen** **Bijlage 3: Betalingsregeling**	**§ 4**. Compensation < Labour costs > < Intended to be flexible. No profit through direct services offered by a party, profit earned through goal achievement >

	Incentive structure	**5.4** Verder heeft de Samenwerking in Alliantieachtig Verband nog recht op verrekening van Bonussen en Malussen in verband met goede of minder goede prestaties op de Kern Resultaatsgebieden, waaronder de KPI's verkeershinder, tijd en [l] <gerelateerd aan de KPIs>	**§ 1.1.2**: (...) To the extent that the Actual Cost is less than the Target Cost, the Parties shall share in any savings realized in accordance with the terms of this Agreement. (...) < gain share > **§ 4.4.1**: definition of gain share percentage **§ 4.5** Goal achievement compensation < to be defined > **Exhibit D-CC** (empty in the model, to be added for a specific case), developed after agreement has been initiated
	Sharing of pain and gain	**Bijlage 3: Betalingsregeling** **1.2 Eventueel aandeel in Alliantieresultaat (positief of negatief)** **BIJLAGE 6** **PROJECT- EN ALLIANTIERESULTAAT**	§ 1.1.2: (...) To the extent that the Actual Cost is less than the Target Cost, the Parties shall share in any savings realized in accordance with the terms of this Agreement. (...) < gain share > § 4.4.1: definition of gain share percentage § 4.2.4: Option to compensate or not compensate NOP for labour costs when TC is exceeded. < Only gain sharing, repetition of the above>
Monitoring & Control	Performance measurement, KPIs	**8. KERN PRESTATIE INDICATOREN** **BIJLAGE 6: 2 KPI's**	**Exhibit D** **Exhibit CC: Project goals** < Option to list KPIs and a bonus for achievement, as well as indicates how to measure achievement >
	Transparency & openness	**1.6 Open Boek** **11.5 Audit**	**§ 2.4.2** < Acknowledge importance of information sharing, Encouragement to share information and knowledge> **§ 4.6**: Record keeping and Owner Audit Rights < open book accounting> **§ 5.4.3**: If any Party comes to believe or acquires information to suggest that the Target Cost may be exceeded (...) it shall immediately notify the other Parties in writing.
Flexibility	Change procedures	**9. WIJZIGINGEN** **Bijlage 7: Wijzigingsprocedure** **13. BIJZONDERE OMSTANDIGHEDEN**	**§ 5.3** Adjusting the Target Cost **§ 5.4** < Potential alterations in case of a recovery plan > **Article A3** Changes in the Work **§ A.5.9** Target Criteria Amendment
	Exit agreement	**14. VOORTIJDIGE BEËINDIGING** **14.1 Beëindiging bij een Grond voor Beëindiging** **14.2 Vrijwillige beëindiging door Publieke Opdrachtgever** **14.3 Beëindiging bij een Geval van Overmacht**	**Article 10** Suspension and Termination **10.2 Termination**

		Australian Project Alliance
Context & Goals	Description of the parties involved	<Only name and address>
	Explication of interest of project and parties	N/A
	Description of goals of project, agreement, and parties	The agreement – background < owner objective to be added> Schedule 2: 2 Alliance Purpose 3 Alliance objectives < to be added from VFM statement>
	Putting goals of the project first	**Art 4.3:** The Participants acknowledge and agree that the Project Owner's VFM Statement is one of the key drivers for the carrying out of the Project and the performance of the Works. Consistent with that, the Participants commit to establishing an alliance culture based on the Alliance Charter and to act at all times in a manner that is consistent with a Best For Project approach.
Interaction	Inclusion of norms and values	**Art 4: commitments** **Art 4.1** Good Faith: In exercising their rights and performing their obligations under this Agreement, the Participants agree at all times to act in Good Faith. **Art 4.2** Achievement of objectives **Art 4.3** Best For Project **Schedule 2** Alliance Charter <lists the alliance principles, to be developed by the client >
	Mutual liability waiver	**Art 4.5** Commitment to no-blame culture **Art 5.1** No litigation or arbitration < Exceptions in article 5.3>
Organisation structure	Joint management team	**Art 6: ALT** Establishment and composition; Chairperson; Functions and responsibilities; Representatives authorised to bind Participant; Meetings; Decisions; Compliance with decisions; Disclosure of conflict of interest; Determination of Separable Portions; Project owner's reserved powers **Art 7: Alliance manager, AMT, APT** Alliance manager - appointment and functions; AMT – selection, endorsement and functions; Change in membership of AMT; APT – selection and functions; Change in membership of APT; Project Office
	Duties and obligations	**Schedule 3**: Responsibility matrix <to be defined>

	Joint decision making	**Art 6.6 Decisions** No decision can be made by the ALT unless: (a) one representative of the Owner Participant and one representative of each of the NOPs are present at the meeting; (b) the decision is unanimous; and (c) it is within the matters contemplated by this Agreement and is made in accordance with this Agreement.
	Mutual early warning	N/A
	Pre-agreed conflict resolution methods	**Schedule 14:** issue resolution procedures
Remuneration	Payment	**Art 16: Payments** **Schedule 5:** Reimbursable costs **Schedule 6:** Corporate Overhead and Profit **Schedule 8:** Payment procedures
	Incentive structure	**Schedule 7**: Risk or Reward Regime <including options for bonus/malus for performance on Key Result Areas >
	Sharing of pain and gain	**Schedule 7:** Risk or Reward Regime < To be developed during Alliance Development >
Monitoring & Control	Performance measurement, KPIs	**Schedule 7** **3 Non-cost component - KRA and Performance Modifier performance**
	Transparency & openness	**Art 4.4** Open book commitment **Art 5.2** Immediate notification of possible issue **Art 6.8** ALT: Disclosure of conflict of interest **Art 17.3 - 17.4** < access to and audit rights for any records/documents >
Flexibility	Change procedures	**Art 12**: Adjustment Events **Art 13:** Directions and Scope Variations
	Exit agreement	**23** No fault termination **24** Termination for Default and repudiation **25** Consequences of termination

APPENDIX C: CODING SCHEME INTERVIEWS

Behaviour	Contract clauses	Collaborative practices
1. Subordinating own interests to those of the project	C.1.1 Description of parties involved C.1.2 Explications of interests of project and parties C.1.3 Description of goals of project, agreement, parties C.1.4 Putting goals of the project first	P.1.1 PFU P.1.2 PSU P.1.3 Formal meeting P.1.4 Informal meeting P.1.5 Other activities (workshops, hoogste punt, eerste paal…) P.1.6 Teambuilding event
2. Supporting 2.1 Don't blame other in case of problems 2.2 Monitoring & correcting errors - Providing constructive feedback 2.3 Co-construction of meaning 2.4 Providing help & Requesting help	C.2.1 Inclusion of norms and values C.2.2 Mutual liability waiver C.2.3 Mutual early warning	P.2.1 Actively approach others P.2.2 Convey goals P.2.3 Developing personal relation P.2.4 Personal development
3. Pro-actively informing 3.1 Quickly respond to requests for information 3.2 Informing other party of any issues that may impede realisation of project goals 3.3 Providing necessary information & knowledge 3.4 Admitting & communicating errors 3.5 Voicing opinion & offering ideas	C.3.1 Joint management organisation C.3.2 Duties and obligations C.3.3 Joint decision making C.3.4 Pre-agreed conflict resolution methods	
4. Communicating clearly 4.1 Provide 'big picture' updates 4.2 Provide complete reports 4.3 Be clear and to the point, avoid excess chatter 4.4 Listening to each other	C.4.1 Payment C.4.2 Incentive structure C.4.3 Sharing of pain and gain	
5. Providing openness 5.1 Being open about intentions & interests 5.2 Providing full openness on areas necessary for realisation of project goals	C.5.1 Performance measurement, KPI's C.5.2 Transparency / openness	
6. Having a critical attitude 6.1 Reflecting on outcome & processes 6.2 Search for and propose improvements / optimisations 6.3 Analysing errors 6.4 Challenging each other's ideas and assumptions	C.6.1 Change procedures C.6.2 Exit agreement	
7. Acting in good faith 7.1 Acting in the spirit of agreements 7.2 Be fair and honest to each other		

8. Respect and value each other 8.1 Treating each other with respect 8.2 Respect each other's interests 8.3 Treat each other as equals 8.4 Recognising the interests and achievements of others		
9. Quickly resolve problems		

APPENDIX D: BEHAVIOUR IN CASES AS MENTIONED IN THE INTERVIEWS

Table 24: Behaviour as mentioned by the interviewees on the cases

	Alliantie Amstelspoor	Sluiskiltunnel	International Criminal Court	A2 Hooggelegen
1. Subordinating own interests to those of the project	✓	✓		✓
2. Supporting				
2.1 Don't blame other in case of problems		✓		
2.2 Monitoring & correcting errors - Providing constructive feedback	✓	✓		✓
2.3 Co-construction of meaning	✓	✓	✓	✓
2.4 Providing help & Requesting help	✓	✓	✓	✓
3. Pro-actively informing				
3.1 Quickly respond to requests for information			✓	
3.2 Informing other party of any issues that may impede realisation of project goals	✓	✓	✓	
3.3 Providing necessary information & knowledge	✓		✓	
3.4 Admitting & communicating errors	✓	✓		
3.5 Voicing opinion & offering ideas	✓	✓	✓	✓
4. Communicating clearly				
4.1 Provide 'big picture' updates	✓			
4.2 Provide complete reports				
4.3 Be clear and to the point, avoid excess chatter				
4.4 Listening to each other		✓	✓	
5. Providing openness				
5.1 Being open about intentions & interests		✓	✓	✓
5.2 Providing full openness on areas necessary for realisation of project goals			✓	✓
6. Having a critical attitude				
6.1 Reflecting on outcome & processes	✓	✓	✓	✓
6.2 Search for and propose improvements / optimisations	✓	✓	✓	✓
6.3 Analysing errors			✓	
6.4 Challenging each other's ideas and assumptions	✓	✓		✓
7. Acting in good faith				
7.1 Acting in the spirit of agreements	✓	✓		
7.2 Be fair and honest to each other	✓	✓	✓	
8. Respect and value each other				
8.1 Treating each other with respect		✓	✓	
8.2 Respect each other's interests				✓
8.3 Treat each other as equals		✓		✓
8.4 Recognising the interests and achievements of others		✓	✓	
9. Quickly resolve problems		✓	✓	

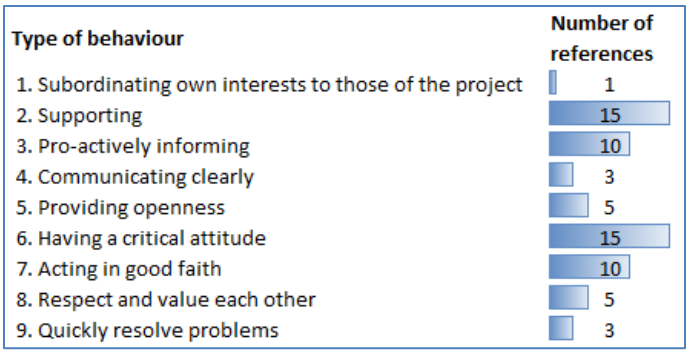


Figure 20: Number of references to behaviour in the 2 interviews for Sluiskiltunnel.

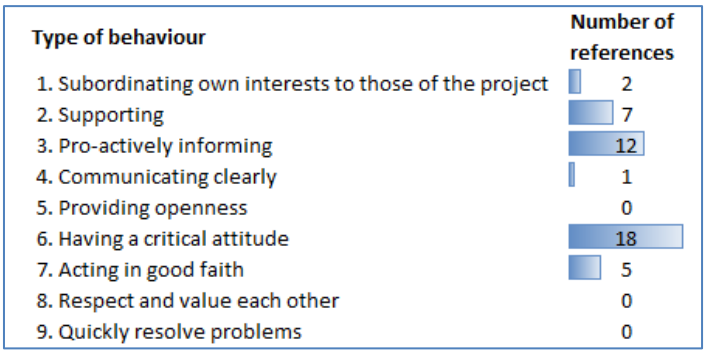


Figure 21: Number of references to behaviour in the 3 interviews for Alliantie Amstelspoor.

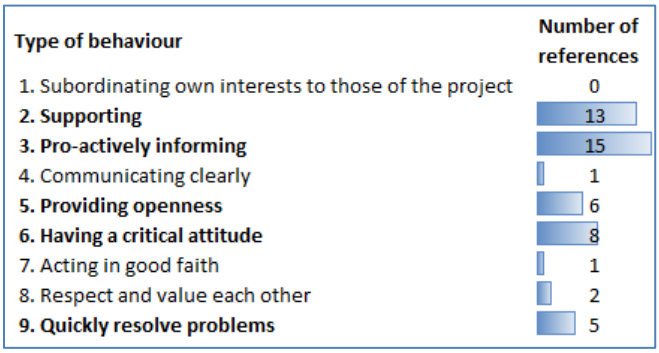


Figure 22: Number of references to behaviour in the interview for International Criminal Court.

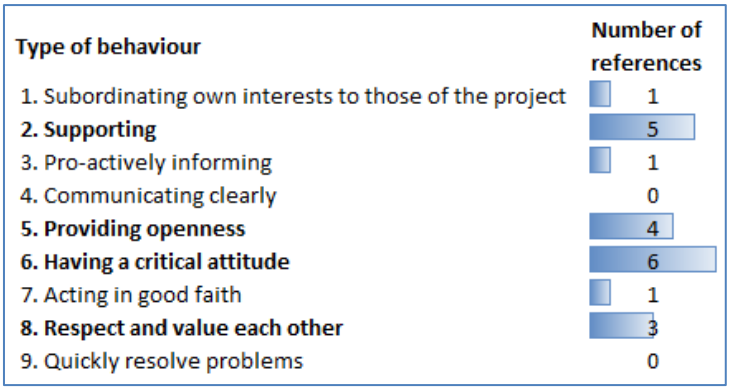


Figure 23: Number of references to behaviour in the interview for A2 Hooggelegen.